Shenandoah National Park

BACKCOUNTRY & WILDERNESS MANAGEMENT PLAN

August 1998

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Shenandoah National Park

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CHAPTER 1
Introduction

1 .l Executive Summary

Resource professionals are challenged to develop effective approaches to wilderness management now - while there is still time to develop policies and strategies by design - rather than wait until problems are racing out of control and our efforts can, at best, be reactions to pressing needs. (Hendee, 1974, p. 28 from Hendee et al., Wilderness Management, 1990, p.4)

Revision of the 1984 Backcountry Management Plan was identified as a high priority Shenandoah National Park (SNP) goal by its employees in 1991. Park staff recognized that many backcountry and wilderness management issues were not being addressed effectively by the existing plan. In November 1991 an interdivisional Backcountry and Wilderness Management Plan Task Force was created to identify and resolve SNP backcountry and wilderness management issues. Initially the task force identified numerous issues unresolved by the existing plan, some of them quite complex, and identified the need to develop a planning framework to provide an organized response to these and unforeseen future issues. Advice and assistance was sought from backcountry and wilderness managers nationwide. With the assistance of Dr. Jeff Marion at the Virginia Tech NPS Cooperative Park Studies Unit (CPSU) the task force gathered volumes of literature related to backcountry and wilderness management issues and planning and researched these materials to develop a planning framework for SNP. A planning framework using concepts provided by "Limits of Acceptable Change" and "Visitor Impact Management" and employing a conceptual model called the "Recreational Opportunity Spectrum" was adopted to apply to SNP backcountry and wilderness management issues.

The task group proposed that this new Backcountry/Wilderness Management Plan (BWMP) also be prepared as a backcountry "sourcebook" useful to interdisciplinary field staff. The resulting document is a comprehensive SNP backcountry management guide which describes not only the planning framework and recommended management actions, but addresses topics including historical SNP backcountry management, relationship to other Park planning documents, SNP backcountry facilities and recreational uses, wilderness awareness education, management of recreation impacts (ie. campsite and trails management strategies), budget and staffing assessment, and Park boundary issues. The BWMP addresses backcountry recreation management specifically and all issues concerning the Wilderness Act. This BWMP is intended to be used as a "working" document which shall be revised as frequently as necessary to reflect changing SNP backcountry conditions and management issues.

An important contribution this BWMP makes to SNP are the new planning frameworks and concepts which can be applied to other aspects of the park operation. Most important, the plan marks a new era of SNP backcountry management by applying wildland recreation research accomplished in the past two decades of evolution of backcountry and wilderness management. As backcountry/wilderness managers we need to continually apply innovative strategies to provide for recreational opportunities yet limit impacts to the park resources. Regardless of how

our overall vision and goals for the backcountry may change over time, we will always need to analyze how well goals are accomplished and adjust our strategies and actions as the types of recreational opportunities change, the reasons for why people recreate change, and the techniques for management and monitoring evolve.

To meet the requirements of the National Environmental Protection Act (NEPA), an Environmental Assessment (EA) analysis has been prepared and is provided in the Appendices. The BWMP has also been reviewed and approved by the SNP Cultural Resource Management Specialist in the context of the National Historic Preservation Act (NHPA), Section 106. Public involvement in preparation of this document includes input from various special interest organizations and individuals.

1.2 History of Backcountry Use and Management

Backcountry management in SNP is a mixture of recreation and visitor management, wilderness management, and resource protection. Many of the backcountry management practices followed today in the Park have been derived from practices or ideas that existed before Congress established the Park. The historical timeline that follows this text illustrates this progression.

The United States Congress authorized SNP in 1926 and established it in 1935 when 176,429 acres were accepted from the Commonwealth of Virginia. By this time many miles of trail and several backcountry shelters existed. Park visitation was high and recreation had become a traditional use of the area.

Prelude to Establishment

During the same period that SNP was established, the need for a nationwide system of wilderness preserves was suggested by Benton McKaye in 1921. The need to actively manage backcountry and wilderness lands to minimize the effects of overuse was suggested by Robert Marshall in 1933 (Nash 1982). McKaye is most often remembered as the first proponent of the Appalachian Trail (AT) which, as he proposed, now runs the length of the Appalachian mountain chain, from Maine to Georgia and through SNP. Today Wilderness designation and existance of the AT contribute to the Park's character.

In 1927, shortly after Congress authorized the Park, the Potomac Appalachian Trail Club (PATC) was formed to regionally promote the AT building effort and to foster the proposed park (Lambert 1979). The early efforts of this organization are the beginnings of backcountry management in Shenandoah National Park. In 1928 the PATC built its first section of trail within the boundary of the proposed park. And in 1930 they constructed the first trail shelter in the U.S. south of New England. It was built near Pinnacles for the sum of $930.00. By 1931 the PATC reported completion of 260 miles of trail, much of it within the Park boundary.

Congress authorized Skyline Drive in 1931. The Skyline Drive displaced several sections of the AT and several shelters, and it effectively converted some of the backcountry to frontcountry and made the entire area more accessible. This and the prominent placement of the road was

opposed by some people. In 1934 the Wilderness Society was conceived at an impromptu meeting along the edge of the Drive. In part the founders hoped to fight against all skyline drives, which they believed detracted from scenic resources.

When Congress authorized the Park, several generations of inhabitants had already lived within the boundaries. This made management of the proposed park an exercise in restoration rather than preservation, an exercise complicated by popularity. For example, in the year prior to establishment, 516,000 people visited the park. By 1937 SNP had become the first National Park to be visited by more than one million people in a year.

Reassertion of Nature

While recreation management was an early concern, natural processes reestablished themselves during a period of relatively minimal backcountry visitation. For example, backcountry management during the 25 year period between Park establishment and 1960 was marked by the construction of a backcountry recreation infrastructure. The 96 mile SNP portion of the AT was completed in 1938. In 1941 PATC reported that 17 three-sided shelters existed in the park (Lambert 1979). Backcountry management of the time did not focus on mitigating the effects of recreation, as it does today, because the number of backcountry visits was not perceived to be causing problems. The effects of recreation were considered to be quite minimal.

Much of the physical recuperation of the backcountry occurred during these early years. Overall visitation dropped during World War II. In 1943 the Park reported 42,000 visitors. This calm period at the park is thought to have allowed vegetation to make significant progress toward masking indications of earlier human settlement (Lambert 1979). Efforts to maintain existing trails expanded shortly after the war when the Park accepted an offer from the PATC to maintain primitive trails. By 1953 the park reported 429,988 visitors. For the first time, annual backcountry overnight visits were also reported at 8,655.

Resource Preservation

A new period of backcountry management began in the early 1960s and extended to the mid-1970s. In 1964, after prolonged public debate, Congress signed the Wilderness Act (Public Law 88-577). That year Superintendent Taylor Hoskins, who started serving at the Park in 1960, began discussing the possibility that some lands in SNP might qualify for wilderness area designation based on the recovery that had occurred (Lambert 1979). The PATC, National Parks Association, Wilderness Society, Sierra Club and others began in 1966 to promote an expanded understanding of the lands that might be appropriate for the National Wilderness Preservation System. Prior to the efforts of these groups, eastern lands were rarely considered for protection as wilderness. In 1970, however, the Director of the NPS recommended that 73,280 acres of SNP's backcountry be designated wilderness.

During this time the Park began to experience a great increase in visitation. By 1967 intended capacity at the frontcountry campgrounds was exceeded so frequently that Superintendent Hoskins instructed Park staff to direct visitors to the backcountry on exceptionally busy days (Jacobsen & Johnson 1992). That year the Park reported 34,000 overnight backcountry visits.

Superintendent Robert Jacobsen began to serve at the park in 1972. Visitation continued to increase. During the short interim period between superintendents Hoskins and Jacobsen, a designated campsite management policy was implemented at the park. Overnight backcountry visitors were told they must camp within sight of red stakes erected or at existing shelters at 39 designated areas. Additionally, the Park began to require campfire permits. In 1973 the park reported over 121,000 backcountry overnight visits. Managers at the time describe the designated camping areas as resembling carnivals, with no privacy and exhibiting significant resource impacts (Jacobsen 1986).

Backcountry overnight visits again exceeded 120,000 at the Park in 1974. Superintendent Jacobsen replaced the designated site policy with one of required dispersal. A set of regulations were established to promote the new policy and to protect resources. New rules included a requirement that visitors obtain camping permits and a prohibition on backcountry campfires (Jacobsen 1986).

Table 1.1

1. Backcountry Visitor Regulations established in 1974.

1. Backcountry Permit required.
2. Group size limited to 10.
3. Camping prohibited within:
   a. 250 yards or in view of paved park road or park boundary.
   b. 1/2 mile or in view of any park facility except a trail shelter.
   c. view from any trail or camping prohibition sign.
   d. view of another camping party or a trail shelter (except in time of storm).
4. No more than two (2) consecutive nights in a single location defined by a 250 yard radius.
5. Glass containers prohibited.
6. Human waste relief not allowed within 10 yards of streams, trails, roads, or facility.
7. Fecal material must be placed in a hole and covered with at least three (3) inches of soil.

Part I, Sec. 7.15(b), Title 36, Code of Federal Regulations

Congress signed Public Law 93-622 authorizing eastern wilderness areas in 1975, and in 1976 enacted PL 94-567, designating 79,019 acres of it in the Park with 560 acres of potential additions. As part of the designation, Big Run shelter was removed from the backcountry, as were all man-made water developments except those that predated the establishment of the Park.

Recent Resource Protection

After 1976 and continuing to the present, backcountry management at the Park began to change. Scientific methods have become more commonly applied. In addition, visitation dramatically dropped by the mid-1990's. In 1976 West Virginia University conducted the first survey of

backcountry campers in the Park (West Virginia University 1977). They also conducted a survey of trail users in 1977.

Congress expanded SNP wilderness area to 79,579 acres in 1978. During this year the park reported 75,000 overnight visitors, of whom 80% arrived between May and October and 90% stayed only one night (Lambert 1979). Overnight camping continued to decline. In 1981 the Park reported 61,000 overnight backcountry visits.

During this period, backcountry visitation remained high for a Park of SNP's size. Park staff became concerned about obvious and widespread environmental impacts in popular camping areas. In response, from 1981 to 1983 the park compiled data to document the condition found on a sample of campsites. Approximately 1300 campsites were estimated to exist. In addition, in a related effort during this period, Park staff rehabilitated 89 campsites throughout the three districts (Marion and Haskell 1988).

The Park staff completed a Backcountry Management Plan in 1984 as an action plan called for by its Resource Management Plan (RMP). This Backcountry Management Plan emphasizes recreation management, wilderness management, and resource protection. The basic objectives for the plan were to provide an opportunity for resource-dependent backcountry visitor experiences while maintaining the integrity of natural ecological processes and minimizing the effects of recreation. Additionally, it integrated with such diverse yet complementary efforts as the Bear Management Plan and Fire Management Plan.

Superintendent Bill Wade began serving at the Park in 1987 and continued the efforts begun earlier. From the 1991 RMP, the park called for a revision of the 1984 Backcountry Management Plan. Superintendent Wade appointed an interdivisional Task Force to revise the plan. The Task Force drew members from the maintenance, resource protection, interpretation, and resource management divisions of the park. Additionally, to gather current information concerning the condition of the backcountry campsites and to assess the policy of dispersal, in 1992 the park initiated a campsite monitoring program with the cooperation of the Cooperative Park Studies Unit (CPSU) at Virginia Tech. Initial results from an extensive inventory reveals 800 campsites, almost a 50% decline from the survey conducted a decade earlier.

Table 1.2

BACKCOUNTRY MANAGEMENT IN SHENANDOAH NATIONAL PARK

1888 Skyland established as the first operation intended to promote recreation in what would become SNP.

Prelude to Establishment

1926 US Congress authorizes SNP with the stipulation that sufficient land must be acquired by state or private efforts.

1927 Potomac Appalachian Trail Club (PATC) formed to regionally promote both the newly initiated Appalachian Trail (AT) and the proposed national park.

1928 PATC constructs its first section of trail near Pinnacles between Thornton Gap and Skyland, the first section of the AT built by PATC.

1930 PATC constructs first trail shelter south of New England. It is located near Pinnacles and cost $930.00 to complete.

1931 Congress authorizes Skyline Drive. Construction of the Skyline Drive overlaps and displaces portions of the AT. PATC reports 260 miles of trail have been constructed in the area authorized for SNP.

1934 Wilderness Society conceived during an impromptu meeting within the borders of the proposed park.

'eassertion of Nature

1935 SNP established at the end of December with the acceptance by Congress of 176,429 acres from the Commonwealth of Virginia. More than 516,000 people visited the proposed park during the year prior to its formal establishment.

1937 SNP becomes the first national park to be visited by more than one million people in a year.

1938 The 96 mile SNP portion of the AT is completed.

1941 PATC reports 17 three-sided shelters exist in the Park.

WWII Visitation drops dramatically. Impressive vegetation growth during this period begins to mask indications of earlier human settlement:

:t-War Superintendent authorizes expansion of the trail system after PATC complaints emerge regarding trail damage from equestrian use. Park accepts PATC offer to maintain primitive trails.

1953 Park reports 429,988 overnight visitors from June through August, but only 8,655 stayed in the backcountry.

esource Preservation

1960 Superintendent Taylor Hoskins begins to serve. 25th Anniversary of Park.

1964 Congress signs Wilderness Act. SNP Superintendent Hoskins begins discussing the possibility that some areas of the Park might qualify for wilderness based on the degree of its recovery from pre-park land uses.

1966 PATC, National Parks Association, the Wilderness Society, Sierra Club, and others begin working toward an expanded understanding of what constituted appropriate land for wilderness system inclusion.

1967 Park reports 34,000 overnight backcountry visits. Camping at designated campgrounds frequently surpass capacity. Superintendent Hoskins instructs park staff to direct visitors to the backcountry when campgrounds are full. Additionally, managers speculate that public debate over potential wilderness designation helped make popular backcountry camping in the Park.

1970 NPS Director recommends 73,280 acres of SNP be designated as wilderness area.

1972 Superintendent Robert Jacobsen follows Hoskins as superintendent at SNP. During the short interim period between superintendents a designated campsite management policy is implemented in the Park. Visitors are told they must camp within sight of red stakes erected at designated campsite areas. These campsites and shelter areas comprised 39 designated areas. Additionally, visitors must obtain and carry campfire permits.

1973 Park reports 12 1,000 backcountry overnight visits. Managers describe backcountry camping areas as resembling frontcountry campgrounds with no privacy and exhibiting significant resource impacts.

1974 Backcountry overnight-visits surpass 120,000 again. The designated site policy is replaced by a policy of dispersed camping. New regulations require visitors to camp out-of-sight of trails and other groups, to obtain backcountry camping permits, and prohibit campfires.

1975 Congress signs Public Law 93-622 authorizing Wilderness designation in the eastern U.S. (referred to as the Eastern Wilderness Act).

Recent Resource Protection

1976 Congress designates 79,019 acres of wilderness area in SNP, with 560 acres of potential additions also identified. As part of wilderness designation, Big Run shelter is removed from the backcountry, as are all man-made water developments except those predating the park. West Virginia University conducts a sociological survey of backcountry campers.

1977 West Virginia University conducts a trail user study in SNP. Overnight camping banned in portions of Limberlost, Hawksbill, and Whiteoak Canyon areas.

1978 SNP wilderness area expanded to 79,579 acres. Park reports 75,000 overnight backcountry visits.

1979 Three shelters along the AT are opened as PATC managed "huts" for long distance hikers on a trial basis. The hut system is expanded during the next two years to include seven huts along the AT for long distance hikers.

1981 SNP reports 61,000 overnight backcountry visits. A backcountry campsite inventcry and rehabilitation effort begins.

1983 Backcountry campsite inventory and rehabilitation program ends. Approximately 1200 campsites are located and assessed.

1984 Backcountry Management Plan completed.

1987 Superintendent Bill Wade begins service. Park reports 38,000 overnight backcountry visits.

1992 Campsite inventory and monitoring program initiated. Approximately 700 campsites are located and assessed.

1994 Draft BWMP is completed, public and in-house review accomplished. NRPP proposal including substantial funding for BWMP implementation is approved.

1997 Superintendent Doug Morris begins service.

1998 BWMP final draft completed. Environmental Assessment and final draft released for public review.

I.3 Backcountry Vision Statement

Shenandoah National Park's backcountry encompasses a significant segment of the Blue Ridge mountains, where natural features and processes and existing cultural resources are protected from human intervention; where modern human use is subserviant to, and enjoyed because of, the natural processes; where only the most essential and least intrusive human facilities are allowed. The visitor has a sense of being in a special place, is physically challenged to explore the terrain, and develops an appreciation of the natural forces which existed and shaped the land prior to human Settlement.

1.4 Backcountry Management Goals

Reasonable efforts shall be made to:

1. protect and perpetuate the evolving ecological system and processes critical to the native flora, wildlife, water quality, geologic features, and scenic values of the backcountry;

2. prevent human-caused degradation of cultural resources found in backcountry areas and protect identified significant examples of Appalachian culture and previous human use in what is now defined as backcountry;

3. provide the opportunity for the backcountry visitor to enjoy backcountry dependent unstructured recreational and "re-creational" experiences in an eastern deciduous forest setting;

4. strive for efficient and effective management techniques that do not sacrifice the quality of backcountry resources or backcountry experiences; and

5. preserve wilderness quality and values in the spirit of the Wilderness Act of 1964.

Additionally, as directed by the Government Performance and Results Act (GPRA, see chapter 3.6) these goals are encompassed by SNP Mission Goal 2 which states:

> Visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services and appropriate recreational and "re-creational" opportunities.

Several quantifiable long-term goals for backcountry management are established under this Mission Goal and are identified in chapter 3.6.

1.5 Backcountry Defined

Backcountry in Shenandoah National Park is defined as the primitive, undeveloped portions of the Park, managed primarily for natural conditions and processes. Facilities and/or cultural resources surrounded by backcountry are part of the backcountry. The Skyline Drive historic zone and associated developed zones are specifically excluded.

Designated wilderness areas are located within and are part of the Park's backcountry.

1.6 Wilderness Designation

In October 1976, Congress enacted Public Law 94-567, which designated nearly 80,000 acres of SNP as wilderness area. Wilderness classification mandates that specific areas of the Park be managed with special consideration for human impacts to the natural environment and visitor recreation opportunities.

The Wilderness Act of 1964 (P.L. 88-577) declares it to be the "policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness". It legally defines wilderness: "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.. . " and as ". . .an area of undeveloped Federal land retaining its primitive character and influence, without permanent improvements". The Wilderness Act states that such areas are to be "…protected and managed so as to preserve" [their] "natural conditions", and that wilderness must have "…outstanding opportunities for solitude or a primitive and unconfined type of recreation". It indicates that the areas must be ". ..of sufficient size as to make practicable its preservation and use in an unimpaired condition".

In an extension of the Wilderness Act, the "Eastern Wilderness Act" of 1975 (P.L. 93-622, authorizing eastern wilderness areas) more clearly defines the intended purpose and use of wilderness areas: ". ..areas...shall be managed to promote and perpetuate the wilderness character of the land and its specific values of solitude, physical and mental challenge, scientific study, inspiration, and primitive recreation. "

SNP wilderness management philosophy and policy are examined in chapter 5; specific wilderness management objectives are stated in chapter 4. The historical perspective of SNP wilderness designation can be found in former Superintendent Jacobsen's collection of articles entitled "The Management of Wilderness of Shenandoah National Park."

CHAPTER 2
DESCRIPTION OF THE BACKCOUNTRY RESOURCE

2.1 Physical Description of the SNP Backcountry Resource

SNP's backcountry includes approximately 196,000 acres. Nearly all areas of the backcountry are returning to forested conditions from substantial human habitation and land use which occurred up until the early 1930s when the park was established. Traces of the mountain culture are still quite evident in the backcountry and are described later in this chapter.

Backcountry topography is typical of the Appalachian mountain range with steep ridges and numerous stream drainages fed by mountain springs and precipitation runoff. Streams vary in size, but are typically small with frequent cascades and waterfalls. The ridges are characterized by thin, rocky soil and exposed rock formations. Elevations ranging from approximately 500 to 4,000 feet create a diverse ecosystem resulting in a wide variety of native flora and fauna. Vegetation is eastern deciduous forest type and seasonally dense. White-tailed deer, black bear, bobcat, wild turkey, ruffed grouse, and other woodland wildlife abound. A detailed description of park backcountry natural resources can be found in the Park's RMP.

The backcountry includes 79,579 acres of legislatively designated wilderness area comprising 40.6% of the park's total acreage. These areas do not include facilities or roads and include primitive trails as the only development. Wilderness boundaries are not physically identified in the backcountry except by large rock barriers placed on former fire roads to prevent motorized vehicle entry.

Approximately 116,000 acres of the backcountry is non-wilderness. Facilities in the backcountry include cabins and huts operated and maintained by the PATC as overnight lodging and a few day-use shelters maintained by the NPS. Most backcountry facilities are located in the Central District. Camp Hoover, a former presidential retreat, is now rarely used as a conference and special activities facility and is actively interpreted to visitors during the summer months. White Oak cabin is sometimes in use as a ranger residence. Structural remains of past mountain culture are located throughout the Park. These remnants are generally not maintained and are subject to natural weathering forces. Other development includes powerlines, gaslines, radio/microwave antennas, and gravel administrative roads. Backcountry facilities are described in chapter 6.

The primary backcountry development is in the over 500 miles of hiking and horse trails. This vast network of trails allows for many circuit hike possibilities and provides backcountry users with a variety of challenges and opportunities. Park trails can be accessed from the park boundary or Skyline Drive. Many trails exist on former mountain roads which twist and wind up ridges and down drainages. The nationally designated Appalachian Trail (AT), which traverses the Appalachian mountains from Maine to Georgia, follows the crest of the park parallelling and often crossing the Skyline Drive for 95 miles. Attractions for many backcountry users include scenic vistas, numerous small streams and waterfalls, wildlife viewing, nature study, and solitude.

2.2 Description of SNP Backcountry Recreational Activities

Numerous backcountry recreational opportunities are available at SNP. These opportunities depend primariiy on the Park's natural resources and the extensive trail system. Backcountry recreation management is discussed in detail in chapter 9. Of all the past visitor surveys conducted in the park, a 1989 Park concessioner marketing research study (ARA Virginia Skyline Company, Reid and Teer) indicated that most visitors (71%) staying in the park found hiking to be a very important part of their visit.

To many visitors, SNP's backcountry is a day use area in which to pursue hiking and nature study activities. However, the Park receives substantial overnight backcountry use. Primitive camping is permitted in the backcountry but visitors must obtain a free backcountry camping permit at designated park facilities or from self-registration stations. Park regulations and trail use information are conveyed or posted at each permit station.

Horseback riding is a popular activity and a number of trails are designated for horse use, which is restricted to these trails. Short, guided day trips are available seasonally with the park concessioner.

Bicycle use, including mountain bikes, is restricted from the backcountry.

Shenandoah's numerous mountain streams provide some of Virginia's finest native brook trout fishing. "Catch and Release" recreational fishing is permitted parkwide, with some streams designated as "closed" to fishing and others designated as regulated "open for harvest" fishing, from which fish may be kept subject to size and creel limitations.

Rock climbing in the park is increasing in popularity. Numerous exposed rock cliffs, particularly in the Old Rag Mountain area, attract technical and free climbing enthusiasts. Presently, climbing is not specifically regulated. This BWMP recommends that a rock climbing plan be developed to manage impacts associated with this activity.

Cross-country skiing in the park is limited by available winter snow cover. Snow cover varies widely from year to year and by elevation; historically, snow cover is frequently inadequate to support cross-country skiing. However, with sufficient snow this can be a highly enjoyable and popular backcountry use opportunity on park trails and service roads. Trails are not maintained for cross-country skiing and this activity is not regulated.

Hang gliding is restricted to three backcountry launch sites in the park near the Skyline Drive and a fee is required to obtain a special use permit. It is the responsibility of the user to identify and obtain landowner permission for landing sites outside of the park. Landing within the park is not permitted. Hang glider activity is infrequent.

All plants and animals are protected in SNP. The collection of artifacts and relics is also strictly prohibited. However, it is permissable to pick fruiting bodies (ie. fruits, nuts, mushrooms) for personal consumption. These seasonal foraging activities add to the ranks of day users during

the "harvest" seasons, especially during the April/May morel (mushroom) season.

2.3 Description of Backcountry Visitor Use and Impacts

Visitor Use Demographics:
In 1996, SNP received 1.6 million visits and approximately 46,727 visitor overnight stays (visitor nights) in the backcountry were recorded. Although the backcountry receives substantial day use, there are currently no accurate means for estimating this use. Backcountry visitor use at the park varies widely depending on accessibility and popularity of individual areas. Backcountry use generally follows park visitation patterns. Visitor use is seasonal and cyclic; November through February are consistently low-use periods while July, August, and October are high-use months. These three months constitute nearly 50% of the park's annual visitation. The intensity of use in October indicates the drawing power of the spectacular autumn leaf color display. Fair weather weekends are peak periods and visitation is usually increased on holiday weekends.

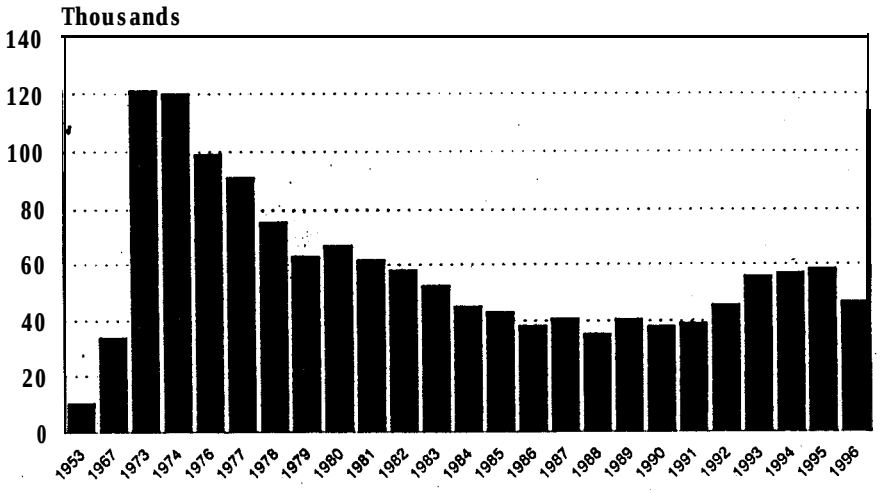
While the Park draws visitors from all over the United States and foreign countries, according to backcountry camping permit data recorded in 1992, 80% of the backcountry overnight visitors came from Virginia, Maryland, Delaware, New Jersey, Pennsylvania, and New York. Overnight backcountry use was particularly regional with 37% of users being from the Washington, D.C. metropolitan area (less than 80 miles from two main park entry points) and 16% from the Richmond metropolitan and Tidewater areas (within 60 to 120 miles of the Park). Notably, visitor use from the Washington, D.C. area was significantly decreased from 57% of 1991 backcountry overnight visitors.

Backcountry camping statistics, derived from permit data, are summarized in Table 2.1.

Table 2.1

Overnight Backcountry Visits to SNP

1953-1996



Backcountry camping at the Park rose from approximately 34,000 visitor nights in 1967 to a peak of 121,000 in 1973. Backcountry camping declined through the 1970s and 1980s to approximately 75,000 in 1978 and to 39,000 in 1992. Overnight visits increased from 39,000 in 1992 to 58,000 in 1995, Visitor nights decreased to 47,000 in 1996, possibly due primarily to Tropical Storm Fran severe impacts to backcountry trails and boundary access conditions in September through the remainder of the year. Although historical data is not available, characteristics such as group size (averaging just over two persons/party), length of stay (averaging just over one night), and campsite location appear to have remained fairly constant through the years. Certain locations, particularly stream and viewpoint areas, are more popular for camping than others and overnight use is only moderately dispersed.

Visitors to the backcountry vary widely in recreational interests, experience, skill, and demands. The preferences and characteristics of backcountry visitors must be considered to provide a diversity of safe and enjoyable backcountry experiences. As an important step in the Limits of Acceptable Change planning process, a comprehensive backcountry social inventory is required so that sociological interrelationships can be documented and managed. Results from the 1976 West Virginia University survey concerning the preferences of backcountry campers and a 1977 trail user survey will be used in the interim. These surveys provide some insight to backcountry user preferences and use patterns. A strategy of this BWMP is to provide opportunities for these preferences managed accordingly to minimize impact to the Park's natural resources.

The West Virginia University survey identified the following recreational attributes, ranked in declining order, for an enjoyable camping experience:

Table 2.2

(1) solitude while camping
(2) selection of personal campsites
(3) solitude while hiking
(4) undisturbed campsites (no evidence of previous use)
(5) campfires
(6) meeting other backpackers
(7) contact with park personnel
(8) permanent shelters
(9) developed campsites

Information provided by the 1977 trail user survey indicated that:

Table 2.3

(1) 67 % of backcountry use occurs on weekends
(2) about 50% of parties consist of two people
(3) 25 % of users are on their first visit to the park
(4) 33% of trail users reported that hiking was the primary purpose of their visit, 19% reported camping, and 14% reported sightseeing
(5) 25 % of users selected a trail because -of an' outstanding feature'
(6) 50% of users were hiking the trail in a two-way direction, 26 % were going one way (using another trail to complete a circuit)
(7) 20% of users were hiking approximately three miles, 57% eight miles or less
(8) 40% of users planned to hike less 'than six 'hours with half of these planning only a two to three hour hike
(9) 5 % found the backcountry crowded, 40% did not (expectedly, weekenders perceived the park to be more crowded than did weekday users).

Notably, hikers on the Whiteoak Canyon trail, one of the most heavily visited areas in the park, expressed feelings of crowding to a lesser degree than the average park visitor.

Although use statistics are unavailable, horseback riding appears to be increasing significantly. Nearly all horse use is day use, although overnight camping is permitted. Most horse use is by visitors who live near the park and is often sponsored by local horse clubs or other recreation organizations. Outfitter/guide operations use park trails infrequently and are authorized only by a commercial license.

Fishing is a seasonally oriented activity with the heaviest use occurring in April and May. Park regulations restrict anglers to artificial lure and fly fishing techniques. The challenge of fishing the small and often remote park streams and the attraction of some of Virginia's finest native brook trout attracts a very serious and dedicated group of anglers from a wide area.

Most fishing and horse use appear to originate from park boundary access points. Boundary entry by visitors is significant and trends in visitor use are monitored by electronic trail counters and/or voluntary trail registration boxes. The boundary entry aspect of visitor use measurement is discussed in chapter 13.

Visitor Use Impacts

Backcountry resources are impacted directly and indirectly by visitor use and park management activities. A wide variety of ecological and human factors determines the scope and magnitude of this impact and affects our ability to successfully manage resource damage. Compared to many other NPS backcountry environments, SNP is relatively resistant to long-term serious impact. A moderate'climate with ample rainfall, good soils, and a long growing season produce

vigorous and diverse plant communities with good regenerative qualities. However, the level of constant and intense impact has, in many cases, exceeded the natural ability of the resource to resist or recover from overuse. SNP managers must not rely on the regenerative qualities of the plant communities but should manage to avoid the impacts of overuse. The impacts of visitor use and Park management actions on vegetation, soils, wildlife, air and water quality, cultural resources, and wilderness and solitude are examined in the BWMP Environmental Assessment, located in the Appendices at chapter 16.1.

2.4 Natural and Cultural Aspects of Resource

The existing SNP Resource Management Plan was approved in 1991 and has been updated continuously through the present time, providing a comprehensive description of park natural and cultural resources. The following is a general and summary description of Park resources based on the RMP "Genera1 Resource Description" chapter,

Natural Resources

Geology

The Blue Ridge Mountains of SNP are a part of the Appalachian physiographic region. The Park is bounded on the east by the Piedmont plateau and on the west by the Shenandoah Valley. The mountains are dissected by streams of varying sizes and the mountain crests contain many rocky cliffs, rock outcrops, and talus and scree slopes.

The geology of the section of the Blue Ridge Mountains located within the park is one of the most outstanding natural features of the area. The exposed formations are among the oldest in North America. The geologic history of the park is the subject of frequent investigations by both eminent geologists and university students. Seven principal rock types form the bedrock of the area, including granitic types (Old Rag granite and Pedlar formation), granitic and volcanized conglomerate types (Swift Run formation), metamorphosed volcanic types (Catoctin formation), and metamorphosed sedimentary types (Weaverton, Hampton, and Erwin formations).

Flora

SNP contains one of the nation's most diverse botanical reserves. The documented flora of the park includes nearly 1,400 species of plants, many of which are found along the forest edge, on exposed rocky mountain summits, and in meadow or bog areas. The eastern deciduous forest here is located in a transitional zone between northern and southern vegetation, so that higher elevations and/or north-facing slopes are often dominated by northern species, while lower elevations or more southerly slopes contain species representative of a central hardwood forest. Because SNP is located in this transitional zone, many plants exist in the park either near the northern or southern terminus of their natural range. Several of these are known to be glacial relics, species that survived the Pleistocene Ice Ages in the Blue Ridge Mountains. They persist at high altitudes, in bogs, or where special climatic features exist.

Seven primary forest types are classified as the following in order of prevalence: chestnut oak, yellow poplar, cove hardwood (consisting of ash, red oak, and basswood), Red Oak and associates, pine (consisting of eastern white pine, Virginia pine, and pitch pine), black locust, and hemlock. The richest and most diverse forest type, occupying hollows or coves occurring in valley bottoms along the mountain slopes, is the cove hardwood forest. This last habitat is considered optimum for plant growth.

The park contains some unusual botanical areas. The Big Meadows Swamp is a true wetland and contains a wide variety of water dependent flora and fauna. Many of the plants on the park's list of rare and endangered species are found only in the Big Meadows Swamp. Other mountain bogs occur at the headwaters of streams and at seeps and contain unusual and rare botanical species. Cliffs and rocky slopes in the park are mostly north- and west-facing areas that support fragile populations of plants, some of which are tundra varieties. A description of unusual botanical areas and the unusual flora and fauna species found within them is provided in A Natural Heritage Inventorv of Mid-Atlantic Region National Parks in Virginia: SNP (Ludwig et al, 1993). Relevant to the BWMP, this "Natural Heritage Resources" report includes in its summary recommendations: ". . . Incorporate natural heritage resource area information in the planning, management, and maintenance documents of SNP.. . . " Some of the information has been incorporated into this BWMP, but study will be required to further address the impacts of the report on SNP backcountry management.

Fauna

Those who explored the Shenandoah Valley and Blue Ridge Mountains in the early 1700's described an abundance and variety of animals. As European settlers cleared the land, exotic species were introduced and the abundance and variety of hunted native animals decreased. A number of native species disappeared, while the populations of many other species decreased. Through the 20th century many animal species were eliminated. White-tailed deer were nearly eliminated by the 1920's and populations of black bear, turkey, elk, and bobcat were reduced substantially.

Since establishment of the park in 1935, some extirpated species have been successfully reintroduced into the recovering forest, and some have recovered without human assistance. Deer were released in the park in 1934 and additional deer entered the park from the Massanutten Mountains in 1938. The deer herd increased gradually and now is roughly estimated at a total park population of about 6,000 animals. Turkeys were reintroduced in 1934 and were introduced on private adjacent lands in the 1950's. Wild turkeys have become a common species, having multiplied to fill all available habitat. Black bear re-established naturally as the land became reforested. In 1989, following an extensive research period, the black bear population was estimated at over 300 animals and now appears to be stabilized. Bobcats are now common in the park, however the number and distribution of this species is unknown.

The opossum, raccoon, skunk, gray fox, and eastern cottontail are other more commonly seen mammals in the park. Over 200 species of resident and transient birds are known to use the park's habitat. A large diversity of reptile and amphibian species exists at SNP and includes 6

species of turtles, 3 species of lizards, 23 species of snakes including 2 poisonous species (timber rattlesnake and copperhead), 17 species of salamanders, 3 species of toads, and 10 species of frogs. In 1989, the Shenandoah salamander was listed as an endangered species. The Peregrine Falcon was reintroduced to the Hawksbill area in 1989 and successful nesting has occurred in the mid-1990's.

Twenty-two species of fish have been recorded in park waters. Of the approximately 90 small streams in the park, 46 are classified as brook trout streams.

Cultural Resources

History of the Area

The story of SNP reveals a continuous interaction between land and people for over 9000 years. Archeological evidence indicates that as early as 8000 B.C., paleo-indians were using the Blue Ridge Mountains. These people were hunters and gatherers who lived in seasonal camps in the mountains. By 1000 A.D., agricultural communities had developed in the surrounding valleys, and use of the mountains was limited to short hunting trips.

The first European to record any exploration of this part of the Blue Ridge was Dr. John Lederer. In 1669, Lederer climbed to the crest of the mountain and described a wild forest teeming with game and a large open area which may have been Big Meadows. In 1716, the Colonial Governor of Virginia, Alexander Spotswood, led a celebrated expedition across the mountain to encourage settlement of the surrounding valleys. During the 18th century, people moved into the Piedmont from the Tidewater region and into the Shenandoah Valley from Pennsylvania. By 1800, settlement of the valleys was fairly complete and the lower ends of the mountain hollows were being occupied. During this period, the native Americans living in the area disappeared completely, or moved elsewhere.

During the 19th century, settlement progressed into the mountain hollows as available land in the lowlands became scarce. The mountain culture became a reflection of society throughout the area, with numerous small industries (grist and saw mills, charcoal manufacturers, tanneries, quarries, and forges) located along the many waterfalls producing waterpower and on the roads that crossed the ridge at the gaps. Stores and churches grew up around these small industrial coomunities. Although flat land for large agricultural operations was scarce, the hilly slopes were idea for the grazing of cattle in the warm months and for the establishment of orchards. For those living high up the mountains, steep, rocky slopes, thin soil, and severe climate kept mountain farming to bare subsistence level, and income was often derived from day labor in the Valley, the Piedmont, or later, at Skyland. At the turn of the century as technology shifted from water power to the use of the steam engine, small industries near the base of the mountain began to fail or move away. The mountain population reached it's peak about 1900. It began to decline until the 400-500 families living in the hollows in 1930 were estimated to be half of what were there 30 years before.

SNP was authorized by Act of Congress in 1926. It provided for establishment of a park with

no expenditure of Federal funds for land purchase. Over a period of ten years, private donations and a major expenditure by the Commonwealth of Virginia secured. the land necessary to officially establish the national park in 1935. In the meantime, the now-famous Skyline Drive was funded as a drought relief measure, and construction began in 1931. In 1933, the Civilian Conservation Corps (CCC) established the first of ten camps managed by the park. The CCC constructed most of the facilities necessary for visitor services, planted tens of thousands of trees and shrubs along the Skyline Drive, conducted vegetative surveys of all park lands, corrected signficant erosion problems created by the construction of the Drive, and expended thousands of labor days on the eradication of exotic plants and pine bark blister rust. Of the people still living on the mountain, many sold their land to the Commonwealth and moved out on their own, while the remainder were evicted and, in some cases, sold farms in the resettlement camps outside the park.

The prevailing philosophy at the time the park was established was that any evidence of human occupation in the "natural area" was a blight on the landscape, in spite of direction from the Secretary of the Interior and Director, National Park Service, that significant historic structures were to be preserved. As a result, many of the buildings in the park were demolished and practically all of those that remained have been allowed to melt into the landscape. Today, very little of the material remains of the mountain culture or border industries exist above grade. Concern for cultural resources in recent years led to passage of the National Historical Preservation Act of 1966 (with amendment) and Executive Order 11593. NPS policies on cultural resources, as specified in Chapter 5 of the "NPS Management Policies" and the "Cultural Resources Management Guidelines (NPS-28)," were subsequently developed. Park managers are now required to survey, evaluate, and as necessary, protect cultural resources in the park.

Historic Sites and Structures

A number of cultural sites are located in the backcountry. Archeological studies have indicated extensive prehistoric human occupation of the Blue Ridge from the Early Archaic to late Woodland Periods. Some of these surveyed sites have been entered on the National Register of Historic Places and as such receive protection from development, overuse, and vandalism so that the subsurface artifacts and general integrity of the sites will remain intact. The General Management Plan (GMP) identifies these sites and historic structures eligible for the National Register of Historic Places. However, recent National Register studies and initial archeological surveys in Nicholson, Weakley, and Corbin Hollows indicate that many more sites within the park are nationally significant. Camp Hoover has been placed on the Register as a National Historic Landmark and Corbin Cabin has been determined eligible as a historic site. All of the PATC administered cabins, PATC maintenance huts, and shelters are believed eligible for the Register. Skyline Drive and the corridor 150' on either side as well as the developed areas at Dickey Ridge, Piney River, Pinnacles, Headquarters, Skyland, Big Meadows, Lewis Mountain, and Simmons Gap are now determined as National Register historic districts. The open area at Big Meadows has been identified as a significant cultural landscape because of its early identification and apparent unnatural condition.

The GMP also identifies historic structures in the park that do not warrant active preservation.

These include homesites, former mills, cemeteries, mines, and church and hotel sites. The historic structures or sites described in the GMP will have to be studied and determinations of eligibility prepared to assess their historic value. Most structures exist only as ruins and unless determined significant by the evaluation process will be allowed to melt into the landscape.

Traces

The backcountry visitor might observe much evidence of structures and other signs of past mountain culture which are being allowed to "melt into the landscape." These traces of prior human habitation exist in various forms: an extensive network of abandoned roads reclaimed by natural forces or impressed into service as trails or administrative roads; deteriorating rock walls, decaying split chestnut rail fences, and rusty wire fencing which defined property lines and fenced in or out farm animals; rockpiles in the wilderness created when the mountain people cleared their fields to farm crops; decaying automobiles or miscellaneous objects ranging from plowshares to pots, pans, and glassware discarded in long-ago dumps; some forgotten and other still-maintained cemeteries; the occasional and somewhat displaced stone chimneys looming out of the underbrush; old homesite building foundations and other associated "disturbed areas"; the unexpected bloom of blue flag iris or lilac and multitudes of other "exotic" garden plants: and the list goes on. This special aspect of the SNP backcountry makes its exploration and study all the more fascinating.

Future Actions:

A. Review and incorporate natural heritage resource area information and recommendations from the Natural Heritage Resources report into the BWMP.

B. Incorporate future archeological assessment and overview information into the BWMP.

CHAPTER 3
INTEGRATING BACKCOUNTRY MANAGEMENT INTO SNP PLANNING

3.1 Reference to Legislation and NPS Management Policies and Guidelines

The NPS Organic Act of 1916 (39 Stat. 535, 16 USC 1) established the NPS, directing it to:

> promote and regulate the use of the Federal areas known as National Parks, Monuments, and Reservations . . . by such means and measures as conform to the fundamental purpose of the said Parks, Monuments, and Reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

Clearly Congress intended park visitation to be contingent upon the ability of the NPS to preserve park environments in an unimpaired condition. What constitutes an "impaired" resource is ultimately a management determination. Similar language is used in the Wilderness Act of 1964 (16 USC 1131-1136), applicable to parks with designated wilderness areas within their boundaries. Wilderness areas:

> shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness...

Authority for implementing Congressional laws is delegated to agencies, which identify and interpret all relevant laws and formulate management policies to guide their implementation. For the NPS, these policies are set forth in a document titled Management Policies, revised in 1988. These policies provide direction for management decisions and adherence is "mandatory unless waived or modified by an appropriate authority."

Several statements in Management Policies specifically require and guide the development of planning documents which address backcountry and wilderness management:

> Backcountry use will be managed to avoid unacceptable impacts on park resources or adverse effects on visitor enjoyment of appropriate recreational experiences. The National Park Service will identify acceptable limits of impacts, monitor backcountry use levels and resource conditions, and take prompt corrective action when unacceptable impacts occur. Management strategies designed to guide the preservation, management, and use of the backcountry and to achieve the park's management objectives will be integrated into the park's backcountry management plan. (Chapter 8:3)

and,

> The superintendent of each park containing wilderness will develop and maintain a wilderness management plan to guide the preservation, management, and use of that wilderness. This plan may be developed as a separate document or as a action component of another appropriate management plan, such as the general management plan or backcountry management plan.. . The plan will be developed with public involvement and will contain specific, measurable management objectives that address the preservation of wilderness-dependent cultural and natural resources and values in order to achieve the public purposes specified by the Wilderness Act and other appropriate legislation. (Chapter 6:4)

Specific mention is made in the Management Policies and in the Natural Resources Management Guideline (NPS-77) to the Limits of Acceptable Change (LAC) model as a planning framework for such planning efforts. Such plans "will establish indicators, standards, conditions, and thresholds above which management actions will be taken to reduce impacts" (Management Policies, Chapter 6:5). Planning models such as LAC are designed to facilitate the balancing of visitor use with the protection of park resources and impacts to other visitor and park uses.

Management Policies also recognizes and authorizes the need for park zoning:

> The general management plan will prescribe a system of management zoning for park lands and waters to designate where various strategies for management and use will best fulfill management objectives and achieve the purpose of the park. The delineation of management zones will be based on an evaluation of the congressionally established purposes of the park; the nature of the park's natural and cultural resources; all past, existing, and anticipated uses; and park management objectives. This prescriptive zoning will consider the capability of lands to support identified uses and will be used as a framework for specific planning and management decisions on use and development of the park. (Chapter 2:7)

NPS-77 specifically recognizes and authorizes the use of management zoning in backcountry management plans:

> The wide diversity of resource opportunities and settings found in parks provides the opportunity for a broad segment of the public to pursue the particular recreational experiences they are seeking. These recreational use opportunities are defined by various physical, biological, managerial, and social conditions... One common technique for preserving this diversity of high quality experiences is the stratification of use levels through zoning. In developing backcountry use management plans, zoning has proven useful as a means of achieving management objectives and. providing different experiences for satisfying various user demands. Managers may want to establish different recreational use zones ranging from areas with high concentrations of use to pristine areas with very little use. (Chapter 3:75)

3.2 Reference to General Management Plan (GMP)

SNP's 1983 GMP provides a "10- to 15-year blueprint of programs and facilities for continuing the mission that started at Shenandoah National Park over half a century ago." The GMP prescribes comprehensive programs for park preservation, interpretation, visitor use, development, and administration.

The GMP states that the park's primary management goal is to continue providing diverse recreational opportunities that are compatible and commensurate with the resources present, so that the use and enjoyment experienced by visitors since establishment of the park is perpetuated. In the context of backcountry and wilderness management this plan describes land protection, natural and cultural resources protection, visitor use management, general development, management zoning, and roads and trails development. Of particular significance to the park's backcountry and wilderness management is its reference to management zoning, which permits the designation of zones in the backcountry to guide management of conforming uses and development. Each zone is identified by "Management Zoning Plan" maps, where "appropriate uses" and "permitted development" are described. The GMP's zoning strategy both supports and guides the "opportunity class" management zoning recommended in this Backcountry and Wilderness Management Plan.

Management alternatives and possible impacts which relate to backcountry management are presented in more detail in the 1981 Environmental Assessment for the General Management Plan.

3.3 Reference to Resource Management Plan (RMP)

The RMP is a continually evolving broad action plan developed to provide direction and continuity and to establish priorities for the protection and preservation of park natural and cultural resources. The RMP lists backcountry and wilderness management as a specific program area included in strategic planning to protect and perpetuate the natural resources of SNP. Numerous natural and cultural resource project statements described in the RMP relate to backcountry/wilderness management. Specific backcountry/wilderness topics in 1997 include: "Manage Backcountry and Wilderness (SHEN-N-030.001)"; "Implement BWMP (SHEN-N-030.002)"; "Conduct Visitor Use Survey/Old Rag (SHEN-N-030.003)"; and, "Regulate Backcountry Use and Mitigate Human Impacts (SHEN-N-03 1 .000)" including "Implement BWMP (SHEN-N-031 .001)", "Trail System: Management and Maintenance (SHEN-N-03 1.002)", and "Boundary Survey/Marking (SHEN-N-03 l-003)."

The RMP includes descriptions of the various resource management programs. The backcountry and wilderness management program description defines the scope of the Backcountry and Wilderness Management Plan, a sub-document of the RMP, as follows: "This program is directed by the objectives and actions described in the Park's Backcountry/Wilderness Management Plan. This plan contains the long-range program directed at maintaining the proper balance between visitor use and the protection of backcountry resources and wilderness values.

Many of the elements of the other program areas are carried out in the backcountry and are therefore related to this program. The primary objective of the backcountry and wilderness management program is to identify what research, monitoring, protection, and mitigation activities are necessary to meet the stated objectives. Backcountry operations will continue to be a high priority activity."

Specific program areas for which park action plans related to backcountry operations have been developed include the Bear Management Plan, Deer Management Plan, Fisheries Management Plan, Gypsy Moth Integrated Pest Management Plan, and the Wildland Fire Management Plan. The relationship of each of these action plans to backcountry operations is as follows:

A. Bear Management Plan: This plan addresses those management concerns affecting the black bear population and its interaction with people. This program directly affects backcountry management and visitor use when it becomes necessary to close trails or restrict use in a given area because of conditioned or aggressive bear behavior. Criteria for area restrictions and closures are defined in the Bear Management Plan. Other backcountry concerns covered in this plan are the impacts of backcountry users on bear behavior, critical black bear life periods, habitat critical to the perpetuation of a healthy bear population, and the handling of "problem" bears in the backcountry.

B. Deer Management Plan: This plan addresses those management concerns affecting the white-tailed deer population and its interaction with people. In backcountry areas the deer population is to be regulated by natural processes to the greatest extent possible. Human interaction with the deer population is much more of a concern in the frontcountry where "tame" deer need to be managed to reduce hazardous interactions.

C. Fisheries Management Plan: This plan addresses those management concerns affecting the native brook trout population. The plan addresses environmental impacts on streams and the human impact of fishing pressure affecting the health of the brook trout population. Fishing is the only consumptive use of wildlife resources permitted in the park. The plan describes this use in keeping with sound natural resource management principles to assure the health of the aquatic ecosystems.

D. Integrated Pest Management Plan: This plan addresses management concerns related primarily to gypsy moth impacts on the historic and natural resources as they affect visitor use and enjoyment of the park. The plan focuses on protection of historic and developed areas from excessive tree defoliation and tree mortality. Backcountry operations might be affected by hazard tree risks to backcountry visitor safety or protection of sensitive natural areas and facilities by application of biological or chemical agents to control the Gypsy Moth.

E. Wildland Fire Management Plan (FMP): This plan is the guiding document for fire management activities within the park. "Fire Management Units" (FMUs) have been established which identify fire management strategies to be used to achieve different fire management objectives according to the natural, cultural, and human resources involved

in park areas. Two different fire management units have been established for the park, using zones defined in the GMP. The park's backcountry lies primarily in the "FMU 2 - Natural Zone" where "all fires will be suppressed, regardless of cause, in the most effective manner possible while minimizing unwarranted resource damage." The few historic areas located within backcountry are included in the "FMU 1 - Developed and Historic Zone" where "all fires will be suppressed, regardless of cause, in the quickest, most effective manner possible." The FMP details specific fire management goals and strategies for fire suppression for each unit. It also describes minimum impact suppression tactics and rehabilitation actions to protect natural and cultural resources.

According to the FMP, human-caused fire ignitions at the park account for 85% of all the historic fires. The FMP describes policy and programs to deal with the continuing high potential for human-caused fires. The most heavy weekend backcountry use periods of April, May, and October coincide in part with the park's established fire season of mid-March through mid-May and mid-September through mid-December. During periods of high fire danger, all or portions of the backcountry may be closed to or restricted from visitor use.

3.4 Reference to Emergency Operations Plan

The SNP Emergency Operations Plan guides operations such as wildfire suppression, extended search and rescue missions, aircraft disasters, and other emergencies which may have an impact on the park's backcountry. When for reasons of public safety or the orderly management of emergency operations, regulation of visitor ingress and movement through the backcountry may be desirable. Authority to close all or portions of the backcountry to visitor use exists in Title 36, Code of Federal Regulations section 1.5 (closures and public use limits).

Existing rules and regulations for the use of the backcountry, including but not limited to camping and fire regulations, the use of aircraft or other mechanized equipment (including use in designated wilderness areas, see chapter 5), and use limits, may be administratively waived during the course of the emergency, and when deemed necessary for the orderly management of the specific operation. All deviation from existing policy and regulations must be approved in writing by the park superintendent. However, minimum impact techniques will be used to the extent possible and practical. Emergency incidents which occur on or near the AT often have implications for other areas of the Trail and should be reported promptly to the AT partners (see Chapter 3.5) so that accurate information is distributed to Trailwide managers and hikers.

3.5 Reference to Appalachian Trail Management Plans

The National Trails System Act (NTSA, P.L. 90-543, as amended) designated the Appalachian Trail as one of the nation's first two national scenic trails. In 1978, the NTSA was amended by Public Law 95-625, which is frequently refered to as "the Appalachian Trail Bill." Public Law 95-625 directed the Secretary of the Interior (in consultation with the Secretary of Agriculture) to develop and submit a comprehensive plan for the protection, development, use, and maintenance of the Appalachian Trail. In 1981, the Director of the NPS and the Chief of the

USDA Forest Service approved the Comprehensive Plan for the Appalachian Trail.

According to the Comprehensive Plan for the Appalachian Trail,

> The Appalachian Trail is a way, continuous from Katahdin in Maine to Springer Mountain in Georgia, for travel on foot through the wild, scenic, wooded, pastoral, and culturally significant lands of the Appalachian Mountains. It is a means of sojourning among these lands, such that the visitors may experience them by their own unaided efforts. In practice, the Trail is usually a simple footpath, purposeful in direction and concept, favoring the heights of land, and located for minimum reliance on construction for protecting the resource. The body of the Trail is provided by the lands it traverses, and its soul is in the living stewardship of the volunteers and workers of the Appalachian Trail community,

The Comprehensive Plan describes the AT's approach. The plan states:

> The primary purpose of the plan is to provide Congress information it needs to meet its oversight responsibility for the Appalachian Trail. To some extent, therefore, the plan is a report on the progress achieved to date in the administration of the Trail. In addition, the plan provides an opportunity to organize the accumulated policy directions, guidelines and understanding about administration of the Trail for the benefit of the private, state, and federal partners in the Trail project.

and,

> The plan is intended to provide a framework for development and management of the Trail and its immediate environs. Detailed guidance for managers is provided by other documents.. .

The Comprehensive Plan for the Appalachian Trail describes a management system for the

partnerships among individual trail clubs and agency partners in a decentralized consultation and decision-making process. Management and maintenance of the AT in SNP is a cooperative effort of the Potomac Appalachian Trail Club (PATC), the Appalachian Trail Conference (ATC), the Appalachian Trail Project Office (ATPO), and SNP.

The PATC, which maintains the AT and many other trails within the park, is a nonprofit service organization dedicated to preserving the AT. Founded in 1927 by seven hiking enthusiasts whose dream was to create a 2,000-mile footpath from Maine to Georgia, PATC now has approximately 5000 members. The PATC's draft Management Plan for the Appalachian Trail, Rockfish Gap. Virginia to Pine Grove Furnace State Park. Pennsylvania (PATC, 1988) is currently being reviewed by agency partners and other interested parties. PATC also maintains a Memorandum of Understanding with SNP (see chapter 8.2).

The ATC, a nonprofit organization of approximately 24,000 members dedicated to protecting and promoting the AT, also serves as a federation for the 32 Trail clubs that manage and maintain the Trail in cooperation with their agency partners. ATC has provided Trail clubs with the Local Management Planning Guide, a comprehensive reference document to aid them in the process of local planning. This guide is used both as an active tool during the preparation and updating of a local management plan and as a permanent reference of current policies for management of the AT. ATC has also adopted standards for clearing, construction, marking, and maintenance of the AT, which are described in ATC's stewardship handbook, Trail Design, Construction, and Maintenance.

The ATPO, which is located in Harpers Ferry, West Virginia, is responsible for ensuring that the requirements of the NTSA for the protection and management of the AT are fulfilled. The Project Office and other park units are guided by the Appalachian Trail Comprehensive Plan in administering the AT.

A Memorandum of Understanding (MOU-2490-97-011) for the Appalachian National Scenic Trail within and adjacent to the park was signed in July 1997 by officials of the PATC, ATC, ATPO, and the SNP. This MOU documents the roles of the respective AT management partners, as well as each party's responsibilities for consultation and coordination prior to any actions that might affect the management of the AT.

Management objectives for the AT in SNP are described in chapter 4.2 of this plan. The role of PATC in SNP backcountry management is described in chapter 8.2, and AT and other trail maintenance standards are summarized in chapter 8.3.

3.6 Reference to Government Performance and Results Act

Performance management using the Government Performance and Results Act of 1993 (GPRA) guidelines establishes a means of routinely using performance management in daily operations. The NPS, and the entire Federal Government, is moving from an operational mode towards performance management using strategic planning to acomplish the NPS mission (NPS GPRA Brief).

According to the National Park Service Strategic Plan (1997), the NPS began work to comply with in 1995 to develop a useful performance management system which is required by GPRA to have both strategic planning and performance measurement, ie. setting goals and measuring results. The NPS Strategic Plan states:

> GPRA seeks to make the federal government more accountable to the American people in its actions and expenditures. The National Park Service, with its mandate to preserve natural and cultural resources and to provide access to the nation's parks and treasures, can and must demonstrate its value to the American people.

and,

> The agency has the opportunity now, for the first time in its history, working with the impetus of the Government Performance and Results Act, to develop a strategic plan for each national park system unit that explains why the unit exists. and what its mission is, what goals management and staff should be achieving to fulfill its mission, and how they might organize the human and fiscal resources to meet those goals within specific time frames.

Servicewide goals and performance measures have been set and strategic plans are developed by individual parks and programs that tier off the servicewide Strategic Plan and its goals.

Based on the Strategic Plan, SNP has developed “mission” and “vision” statements and, from the Strategic Plan’s four categories of servicewide mission goals, has developed six mission goals which enable the park to focus and align its activities, core processes, and resources to support mission-related outcomes. Mission goals articulate the ideals that the park is striving to attain. These are not quantifiable, but they provide the basis for quantifiable long-term goals. Long-term goals establish performance measures, help to develop reporting methods, and are generally written to be achieved in a five-year timeframe.

This BWMP, with its specific management objectives and established performance measures, is but one of the park processes driven by GPRA. The management of SNP backcountry and wilderness has relevance to all of the six SNP Mission Goals, but is specifically directed by Mission Goal 2 which states,

> Visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services and appropriate recreational and "re-creational" opportunities.

Long-term goals associated with Mission Goal 2 which relate most directly to issues addressed by this BWMP include:

2.1 By 2002, 70% of visitors surveyed are satisfied with their “visitor experience” as defined in a manner consistent with park purposes, significance and values.

2.2 By 2002, all changes to backcountry and wilderness resources caused by visitor behavior are within acceptable levels.

2.3 By 2002, 80% of visitors surveyed have basic information about park resources and opportunities.

2.4 By 2002, 80% of visitors surveyed are satisfied with the availability, accessibility, and quality of park facilities and services.

2.5 By 2006, park facilities are accessible and new projects demonstrate sustainable practices.

The **Backcountry Vision Statement** (chapter 1.3) and **Backcountry Management Goals** (chapter 1.4) reflect generalized SNP backcountry and wilderness management in philosophical terms consistent with GPRA management directives and goals.

CHAPTER 4
BACKCOUNTRY/WILDERNESS MANAGEMENT PLANNING FRAMEWORK

4.1 Introduction to Limits of Acceptable Change and Visitor Impact -Management (LAC/VIM) Frameworks

The Concept of Carrying Capacity

The central theme of this BWMP is the description and management of SNP backcountry recreation "carrying capacity. " The carrying capacity concept is generally used to identify the limits to the amount of use a resource can sustain for a given set of objectives. It is based on "change" and recognizes that any use of the resource results in change to the resource and to the social quality of the backcountry recreational experience.

Traditional models of carrying capacity are based on two assumptions: (1) increased use results in declining quality of recreational experiences or environmental quality, and (2) a determinable maximum value exists which represents the "capacity" of recreational land. Prior SNP backcountry management planning appears to have some basis on these assumptions. However, problems with the traditional models have long been identified. A substantial amount of scientific research has found that both assumptions are false due to the complexities of the sociological and ecological relationships involved. For example, numerous surveys of backcountry and wilderness visitors have found that factors such as the location, mode of travel, group size, and behavior of other visitors encountered are more critical to satisfaction than mere numbers of visitors encountered. These factors and others, including vegetation type, season of use, and visitor management policies, are often more influential than visitor numbers in determining the severity of resource impacts. The traditional view of carrying capacity has been too simplistic and has evolved. Complex but fundamental issues need to be considered to resolve disparity in backcountry supply and demand.

The following four points, as described in Wilderness Management (Hendee et al. 1990), address the evolution of the carrying capacity concept:

1. Carrying capacity is a relative term, not an absolute number to be discovered by managers and researchers; its range depends on specific objectives established for an area.

2. Capacity must be established and identified in the field by managerial judgements; no magic yardstick can tell when it will be or when it has been exceeded.

3. Capacity is tied to (a) the qualities of the physical-biological environment, and (b) the qualities of the human experience available in wilderness (ie. SNP backcountry).

4. Development of capacity limits is a necessary part of the planning process for those areas and locations where unacceptable change may occur; to achieve the long term goals of wilderness preservation (ie. SNP backcountry preservation), time and space aspects of

wilderness (ie. SNP backcountry) use must be managed to avoid unnatural changes.

Wilderness Management also describes the following considerations in managing use and impact:

1. Managers need to determine the kinds of impacts that will occur and their possible implications; natural resource, sociological, and managerial factors are to be considered.

2. The inevitability of change is a critical consideration that managers must take into account in prescribing carrying capacities.

3 Determining the amount of change that will be considered acceptable involves a subjective value judgement, but such judgements are derived from the management objectives prescribed for the area (ie. NPS and SNP legislation, administrative policies, management guidelines, and park management objectives).

4. The focus of concern in use and impact management (the impacts of use on resources and other users) is often related to aspects other than the number, or amount, of users.

Limits of Acceptable Change

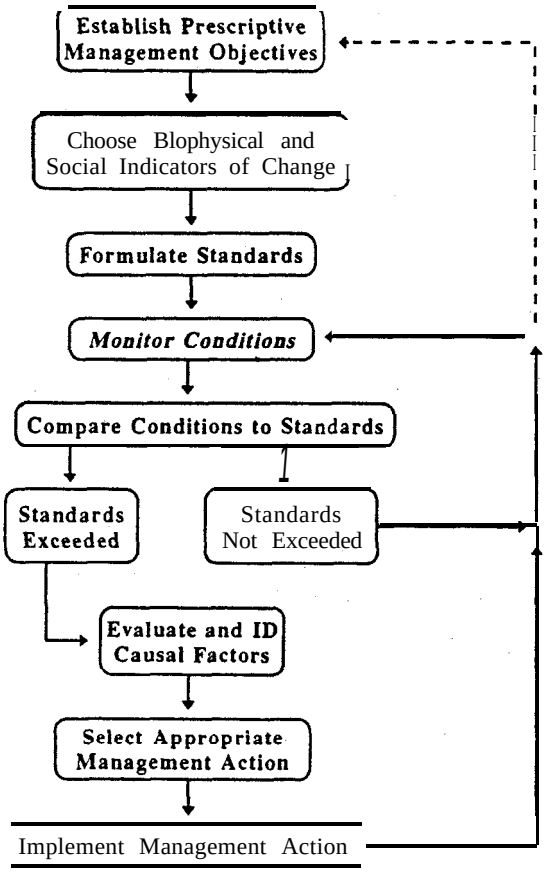
The Limits of Acceptable Change (LAC) process is an evolution or reformulation of the carrying capacity model; it represents a new and alternative approach for resolving the carrying capacity issue (Hendee et al. 1990). LAC focuses on impacts to the conditions of an area that result from use instead of how much use an area will tolerate. It is a planning framework for establishment of limits in the change that may occur within physical-biological and social-psychological parameters of recreational opportunity. Two points are important:

1. For any given use which produces at least some impact, the LAC process requires managers to identify where, and to what extent, certain degrees of change are appropriate and acceptable.

2. Once appropriate and acceptable change has been identified, managers can select from an array of management techniques to ensure that desired conditions are maintained or restored.

SNP has selected a combined LAC and Visitor Impact Management (VIM) (Graefe et al. 1990) model for backcountry management planning as illustrated in Table 4.1 and adapted from Marion et al. (1985). VIM has similarities to LAC and without describing distinctions between the two here, VIM is incorporated into the SNP planning framework.

Table 4.1



The following six steps are used in the application of LAC/VIM to SNP backcountry management planning:

1. Determine prescriptive management objectives:
Specific physical, biological, and social conditions that park management seeks to create, restore, or maintain within areas of the SNP backcountry were described. "Opportunity classes" were defined; collective narrative descriptions of resource, social, and managerial conditions for each opportunity class constitute the management objectives.

Opportunity class designates the availability of a particular quality or kind of experience that is appropriate to the conditions (Hendee et al. 1990). The "Recreational Opportunity Spectrum" (ROS) model, a highly developed recreation classification system, was used to identify opportunity classes and corresponding management objectives (Manning 1986).

2. Describe indicators of change:
Biophysical and social "indicators" of change were identified and described to provide evaluation of the specified management objectives. The ROS model was used as a reference to develop the indicators.

3. Formulate standards:
The indicator "standards" are subjective value judgements by managers (with public input) to specify the "limits of acceptable change," establishing a measurable reference point to which future conditions can be compared. The standards are derived from the management objectives and are quantifiable.

Social and resource inventories are necessary to characterize resource and social conditions. A survey of Shenandoah's backcountry visitors is planned to collect a variety of sociological information. In the interim, backcountry visitor social surveys conducted in the 1970's have been relied upon. Current resource baseline conditions for backcountry campsites were documented in 1992, a trail condition study has also been requested. Standards will need to be revised as these new research surveys are completed and analyzed. Standards will remain flexible so that management "limits of acceptable change" will be realistic. The limits define the boundary between acceptable and unacceptable conditions; standards represent the upper limits which management will permit. However, management will strive 'to keep conditions from deteriorating to this highest acceptable limit. Where possible, it is the intention of SNP to identify the rate of change not to be exceeded in addition to specific standards. In some instances management actions may be taken in backcountry areas as conditions approach, but may not have reached, the established standards. The ROS model was used as a reference in developing the current standards.

4. Monitor conditions:
Standardized monitoring programs are being developed and will be implemented to assess current conditions with respect to each indicator. These programs will include sociological surveys, impacted campsite monitoring, and trail condition monitoring.

5. Compare bio-physical and sociological conditions to standards:
Monitoring data will periodically be compared with standards. Monitoring continues and changes occurring can be evaluated and appropriate preventative management actions will be taken. If the standards are exceeded, more drastic management actions might be necessary. The underlying cause(s) of the problem must be identified and appropriate corrective actions will be selected.

6. Implement management action:
Once actions are selected, they will be implemented. Continued monitoring will be essential to determine the relative effectiveness and success of the implemented actions. An ongoing cycle including steps 4 through 6 will therefore provide the basis for the management of backcountry recreational use in SNP. LAC supports reflection and revision of management objectives (step 1) as conditions warrant.

Recreational Opportunity Spectrum (ROS) Defined

The Limits of Acceptable Change planning framework recognizes that a wide spectrum of recreational opportunities may exist within an area. The LAC/VIMS framework incorporates a recreation classification system called the Recreation Opportunity Spectrum (ROS). ROS is a conceptual model which encourages diversity in outdoor recreational opportunities (USDA Forest Service,' 1980). For a further description of the ROS model and the proposed recreational opportunities for SNP backcountry, see Chapter 4.2, "Management Objectives. "

Part of the theory behind the ROS model is based on human motivations for recreation--why people recreate. From a behavioral science approach, four levels or hierarchies of demand for recreation are described: activities, settings, psychological outcomes, and ultimate benefits. ROS provides a framework for describing recreational settings.

Recreation settings are defined by three broad categories of factors: environmental, social, and managerial. By describing ranges of each of these factors, different types of opportunity classes can be defined. This SNP Backcountry and Wilderness Management Plan includes five different opportunity classes ranging from a Primitive Wilderness Class at the low-use end of the opportunity spectrum to a high-use Threshold Class. A separate opportunity class is identified for the AT and associated structures.

Previously described, SNP's wilderness and backcountry areas are being naturally reclaimed after substantial historical human habitation. There are no large true pristine areas or virgin forests. In much of the backcountry, traces of historical human activity are a reminder to the backcountry user of the culture that existed in the area before the park's creation. The resource descriptions listed under the opportunity classes generally describe SNP's backcountry areas since the park's creation and assist managers to visualize the direction of backcountry and wilderness management at SNP.

SNP is mandated to manage the approximately 80,000 acres of legislatively designated Wilderness areas in the backcountry as described in the Wilderness Act of 1964. However, within these wilderness areas, the recreational opportunities, social conditions for the user, and human impact on the land vary widely. Some areas receive very little use so that the opportunity for solitude is outstanding and human impact is minimal. In other wilderness places, especially trail areas such as the Ridge Trail on Old Rag Mountain, the user may have to actually wait in line to climb rock scrambles. In some trail areas impact on the land has been substantial both in terms of trail and campsite impacts. To a large extent, these use patterns pre-date the area's wilderness designation.

Most of the backcountry is not designated as wilderness. In some of these areas, social and resource conditions meet or exceed those in areas designated as wilderness. Finally, the nationally significant AT is specially legislated as a National Scenic Trail. It is a backcountry trail area with special history, traditions, and values and offers a different social-psychological experience than the backcountry user finds elsewhere in the park.

Factors such as legislative mandates and historic and current use patterns have helped to describe these opportunity classes. Although the LAC process recommends that classification not depend on current use, SNP managers recognize that some areas of the backcountry will continue to receive high levels of use due to factors beyond the control of management efforts. The most noted example is the Old Rag region, which is classified as Threshold in spite of its wilderness designation. Old Rag's popularity as a destination, its ease of access from the park boundary, and the recreation traditions which have been established act against its management within any other opportunity class designation. For the sake of simplicity, wilderness and non-wilderness have been combined in the description of the Semi-primitive Class and Threshold Class. This is not a dilution of the wilderness designation, but acknowledgement that much of the SNP non-wilderness backcountry exhibits characteristics and is managed under the same principles as designated wilderness.

4.2 Management Objectives

Opportunity Classes Defined:

1. **Primitive Wilderness (low use)**

A. Resource Setting

The primitive wilderness setting contains much of the park's designated wilderness areas. The area is characterized by a largely recovered natural environment with lightly maintained or unmaintained trails. Concentration of users is very low, and evidence of other area users is minimal with the exception of existing trails and historical or cultural resources. Ecological and natural processes are not measurably affected by the actions of users. Environmental impacts (human) off trails are minimal and restricted to minor temporary loss of vegetation where camping occurs. These areas typically recover on an annual basis, and impacts are subtle in nature and generally not apparent to most visitors.

B. Social Setting

High to outstanding opportunities for solitude and isolation exist while traveling off trails, and the probability of encounters with other users or management personnel along trails is generally infrequent, particularly with greater distances from Skyline Drive or the boundary. The user has outstanding ~~[illegible]~~ opportunities to travel cross-country utilizing a maximum degree of minimum impact outdoor skills. The environment offers a high

degree, of challenge, self-reliance, and risk. Inter-party contacts will be very few while traveling and low to non-existent at campsites.

C. Managerial Setting

Management strongly emphasizes sustaining and enhancing the natural ecosystem and promoting and perpetuating the wilderness character and values associated with wilderness designation. Backcountry camping permits are required. Necessary rules and regulations will be communicated to visitors outside the area such as at permit-issuing stations or trailheads.

Direct on-site management of visitors is seldom used. Formal and informal user education programs will be initiated to inform users about what to expect and how to use the area for optimum benefits to all. Patrols and monitoring of conditions by appropriate park personnel will be conducted only as necessary to achieve management objectives. Existing trails will be minimally maintained to accommodate light and infrequent travel. New trails will not be constructed. The prevention of resource damage dictates the frequency and specifications of treadwork and drives trail maintenance standards. The objectives for trail maintenance are further described in chapter 8. Signs may be present for resource protection or for trail direction only.

No administrative structures will be provided or permitted. Motorized use within the area is not permitted except under emergency conditions or to meet administrative requirements and then only on a case by case basis.

2. Primitive Non-wilderness (low use)

A. Resource Setting

The Primitive Opportunity Class is characterized by a largely recovered natural environment. User actions minimally affect the ecological and natural processes or the cultural resources. Trails exist but may be minimally maintained. Environmental impacts are low and restricted to minor losses of vegetation where camping occurs and along trails or travel routes. Most impacts, with the exception of trails and historic cultural resources, recover on an annual basis and will be apparent to only a low number of visitors. Primitive areas include much of the non-wilderness areas where use is low.

B. Social Setting

High to outstanding opportunities exist for exploring and experiencing isolation from the sights and sounds of man with the probability of encountering other users being low with greater distances from the Skyline Drive or the boundary. The user has good opportunity for experiencing independence, closeness to nature, tranquility, and self-reliance using minimum impact skills. These opportunities occur in an environment that offers a high

degree of challenge and risk. Inter-party contacts will be low on the trail and rare to non-existent at the campsite with parties camped in isolation.

C. Managerial Setting

Management will emphasize sustaining and enhancing the natural ecosystem and cultural resources. Direct on-site management will involve minimum visitor contact during the normal use season. Backcountry camping permits are required. Necessary rules and regulations will generally be communicated to visitors outside the area through trailhead signs, printed materials, and direct contact with rangers. Formal and informal user education programs will be initiated to inform users about what to expect and how to use the area for optimum benefit to all. Patrols will be conducted by park personnel to monitor conditions and to meet management objectives.

minimum information necessary to protect the resource and to provide direction. New trails will not normally be constructed except to reroute an existing trail or to prevent unacceptable impact from occurring. Trails will be maintained to accommodate light and infrequent travel. The primary objectives of trail maintenance are described in chapter **8.**

Administrative structures will not be allowed. Other structures or facilities such as toilets or hitchracks will not be permitted except in a few rare instances when no other management solution is feasible. Motorized equipment is limited for purposes of trail maintenance by park personnel or other official trail maintenance groups, or for ecological monitoring.

3. Semi-primitive Wilderness and Non-wilderness (moderate use)

A. Resource Setting

The Semi-primitive resource setting is characterized by a mostly recovered natural environment. In a few areas ecological and natural processes are affected by the action of users, but within set standards and limits. Some areas along off-trail travel routes and near human impacted sites may show loss of vegetation or minor erosion. Impacts in some areas often persist from year to year and may be apparent to many visitors. Semi-primitive areas include some of the popular destination-type wilderness and non-wilderness trail areas or areas close to the boundary.

B. Social Setting

Moderate opportunities exist for exploring and experiencing isolation from the sights and sound of man, with a low to moderate probability of encountering other users or park personnel. Encounters with others are likely to increase as the user nears Skyline Drive

or the park boundary. The user has good opportunities for experiencing independence, closeness to nature, tranquility, and self-reliance through the application of minimum impact outdoor skills. These opportunities occur in a natural environment that normally offers a moderate degree of challenge and risk. Contact with other visitors on the trail or while camped may be frequent during peak seasons. Visitors may occasionally encounter park personnel traveling in a motor vehicle along a designated fire road in non-wilderness areas.

C. Managerial Setting

Management will emphasize sustaining and enhancing the natural ecosystem and cultural resources. On-site management will involve routine visitor contact. Backcountry camping permits are required. Necessary rules and regulations will generally be communicated to visitors outside the area, through trail head signs, printed materials, and contacts with rangers. Additionally, contact will be initiated by park personnel during routine patrols. Information concerning protection of site-specific wilderness and backcountry resources will be presented. Formal and informal user education programs will be initiated to inform users about what to expect and how to use the area for optimum benefit to all.

Direct site management may be needed to limit impacts, but only as necessary to meet set standards. Signs will be permitted within the area and will include the minimum number necessary to protect the resource, inform visitors of safety hazards, and for administration. Trails will normally be constructed and maintained to accommodate a moderate level of use for the majority of the use season. The primary objectives of trail maintenance are described in chapter 8.

Administrative structures will be limited to existing cabins or shelters. Other structures such as hitch racks, toilets, pipe springs, and bridges may be allowed but on a limited basis. New structures may be permitted on a case by case basis. Administrative roads may exist as needed in non-wilderness only, but no new ones shall be constructed and maintenance will be limited to clearing the road and limiting erosion. Motorized equipment for purposes of trail maintenance or ranger patrols are limited in non-wilderness areas. Motorized vehicles may be used on administrative roads by authorized persons only. Motorized use within wilderness is not normally permitted except under conditions outlined in chapter 5. No new facilities or structures will be constructed in wilderness.

4. Threshold Wilderness and Non-wilderness (high use)

A. Resource Setting

The Threshold opportunity class is characterized by a predominantly natural and generally recovered environment. Natural conditions in many locations may be substantially affected by the action of users. Environmental impacts may be significant

in areas along major trails and travel routes and near major entry points. Impacts often persist from year to year, and there may be moderate loss of vegetation and soil at some sites. Impacts are readily apparent to most visitors. Threshold areas typically include nature trails and high day-use areas or areas that are close to developed areas or boundary accesses.

B. Social Setting

Opportunities for exploring and experiencing isolation from the sights and sound of man are moderate to low. The probability of encountering or hearing other area users is moderate to high. The user has the opportunity for a high degree of interaction with the natural environment, often with low or moderate challenge and risk. Contacts with other users may be relatively high, both on the trail and at campsites. It may be common during peak use periods for some parties to come within sight or sound of each other while at campsites. Motorized vehicles may be encountered while traveling along an administrative road in non-wilderness areas.

C. Managerial Setting

Management will be oriented to sustaining and restoring the natural ecosystem and cultural resources. On-site management will involve routine visitor contact. Backcountry camping permits are required. Necessary rules and regulations will generally be communicated to visitors outside the area through trail head signing, printed materials, and contacts with rangers. Patrols by park personnel will concentrate on contacting visitors. Information concerning minimum impact, wilderness management, user conflicts, fire prevention, and other pertinent subjects will be presented. Formal and informal education programs will inform users about area conditions and how to use the area to minimize impacts to the resource and to other people.

Direct site management may be used to limit impacts and meet management objectives. Public use restriction and enforcement actions will be initiated when necessary. Signs will be used for resource protection, safety messages, directional purposes, and in non-wilderness areas may be used to present educational information. On nature trails, guide booklets and exhibits may be used. Trails will normally be constructed, maintained, and managed to accommodate seasonally heavy use. The primary objectives of trail maintenance are described in chapter 8. Existing administrative roads will be allowed if needed in non-wilderness areas, but no new roads will be built and maintenance is limited to keeping roads clear and prevention of damage to resources. Administrative structures will be limited to existing cabins or shelters in non-wilderness areas, but no new structures will be built. Other structures such as horse hitching racks, toilets, and bridges may be provided only in exceptional cases. Permitted structures will exist only for resource protection. Motorized equipment may be used by park personnel or other authorized trail maintenance personnel for purposes of maintaining trails in non-wilderness areas or for ecological monitoring. Motorized vehicles may be used on designated administrative roads by authorized persons only in areas not designated as

wilderness. Motorized use within wilderness is not permitted except under emergency conditions or to meet administrative requirements and then only on a case by case basis as described in chapter 5.

5. Appalachian Trail Wilderness and Non-Wilderness (varying levels of use)

A. Resource Setting

The area is characterized as the Appalachian Trail which parallels and frequently crosses Skyline Drive throughout the length of the park. The area adjacent to the trail is largely a recovered natural environment, and the trail itself harmonizes with the natural environment and is well maintained. Concentration of users varies from low to high depending on the season and trail location. Evidence of other AT users is moderate, with the exception of heavy weekend use, and huts and cabins associated with the trail. Environmental impacts off the trail and away from huts may be moderate and may persist from year to year. The opportunity class includes the AT footpath and hut and cabin land assignments (described in the PATC Concessions Permit).

B. Social Setting

Opportunities for exploring and experiencing isolation from the sights and sound of man are low to moderate. The probability of encountering or hearing other area users and vehicles along Skyline Drive is moderate to high. The opportunity for challenge and risk and interaction with the natural environment is low. Much of the time contacts with other users will be relatively high both on the trail and at huts and cabins, however contacts at campsites should be relatively low. It is common for parties to camp together at huts, but parties should be out of sight and sound of each other at campsites along the trail. Motorized vehicles may be seen and heard from the nearby Skyline Drive.

C. Managerial Setting

The existance of the AT as an extended footpath through the park is consistent with park values. The unique natural, cultural, and scenic character of the AT and historic trail construction techniques and tradition of cooperative maintenance are recognized and will be preserved. Park managers have the obligation and responsibility to consult the regional PATC and the national Appalachian Trail Conference (ATC) in accordance with the National Scenic Trail designation in coordination of management actions. Actions will be oriented to sustaining and enhancing the natural ecosystem and cultural resources. Backcountry camping permits are required except at cabins, which require reservations through the PATC. Necessary rules and regulations will generally be communicated to visitors off the trail at entry points or at huts (see chapter 6). Contact will be initiated by park personnel during patrols. Formal and informal education programs will inform users about area conditions and proper use to minimize impacts to the resource and other people.

Direct site management', such as area closures, designated campsites, etc. may be needed to limit impacts. Signs will be permitted along the trail and will include the minimum number necessary to protect the resource and provide safety messages and trail information. The AT will be maintained to a high standard to accommodate a high use level and to maintain the integrity of the special trail designation. The primary objectives of trail maintenance are described in chapter 8. Administrative structures will be limited to existing huts, toilets, and pipe springs and no' new structures will be allowed. The trail crosses administrative roads and the Skyline Drive. Reroutes of the trail wiil be allowed only on a case by case basis, primarily to avoid proximity or crossings of Skyline Drive. Motorized equipment is limited for purposes of trail maintenance by park personnel and the PATC or for ecological monitoring in non-wilderness areas only. Motorized use within wilderness is not permitted except under emergency conditions or to meet administrative requirements and then only on a case by case basis.

Summary of Management Objectives

The following Tables 4.2 and 4.3 describe specific management objectives in the managerial, resource, and social settings for the proposed SNP opportunity classes. Table 4.4 describes social indicators and standards for the opportunity classes. Table 4.5 describes resource indicators and standards for the opportunity classes. Indicators were selected which define specific elements in the SNP backcountry social and resource settings that change in response to human activities. These indicators were selected based on such criteria as reliability, feasibility, expense of measurement, and others (Krumpe and Mergliano, 1987).

Resource standards listed within each opportunity class were determined by the Task Force based on documentation provided by a SNP backcountry campsite inventory conducted in 1992-93 (Marion and Williams, 1993). Campsite "condition class" is defined and described in chapter 9. Social standards are judgements based on the consensus of Task Force member backcountry management experience. These standards will be evaluated and refined upon completion of a SNP backcountry user survey (social inventory).

Indicators can be added or deleted and standards can be revised based on public input, management experience and policies, or 'from monitoring data.

Table 4.2

Summary of Resource and Social Setting Components for Opportunity Classes

COMPONENT	PRIMITIVE WILDERNESS (low use)	PRIMITIVE NON-WILDERNESS (low use)	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS (moderate use)	THRESHOLD WILDERNESS/ NON-WILDERNESS (high use)	APPALACHIAN TRAIL WILDERNESS/ NON-WILDERNESS
Resource Setting: General Description	Regenerated natural environment		Essentially regenerated natural environment	Predominantly regenerated natural environment	
1. Ecological conditions (off trails)	Not measurably affected by the action of users	Minimally affected by the action of users	Moderately affected by the action of users	Many sites substantially affected by action of users (campsites, social trails, viewpoints)	Moderately affected by action of users
2. Prevalence of change due to recreation (off trails)	Minor disturbance to vegetation where camping occurs which usually recovers annually.		Moderate loss of vegetation where camping occurs and along some off-trail travel routes. Impacts in some areas persist annually.	Moderate loss of vegetation and soil on human-impacted sites and off-trail travel routes. Impacts often persist annually.	Moderate loss of vegetation where camping occurs. Impacts may persist annually.
3. Visibility of impacts (off trails)	Not apparent to most visitors	Apparent to a low numbers of visitors	Apparent to a moderate number of visitors	Impacts are readily apparent to most visitors	Apparent to a moderate number of visitors
Social Setting: General Description	High to outstanding opportunities for isolation and solitude		Moderate opportunities for isolation and solitude	Low to moderate opportunities for isolation and solitude.	
1. General level of encounters	Low to infrequent		Moderate	Moderate to high. Groups are common.	Frequent to Very Frequent
2. Degree of challenge and risk	High		Moderate to Low	Low to moderate	Low
3. Interparty contacts while traveling	Few		Moderately frequent	Numerous. May have to stop to let others pass.	Few to numerous.
4. Interparty contacts at campsite	Low to non-existent		Moderately frequent	Common	Common at facilities

ıble 4.3

Summary of Managerial Setting Components for Opportunity Classes

COMPONENT	PRIMITIVE WILDERNESS (low use)	PRIMITIVE NON-WILDERNESS (low use)	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS (moderate use)	THRESHOLD WILDERNESS/ NON-WILDERNESS (high use)	APPALACHIAN TRAIL WILDERNESS/ NON-WILDERNESS
Managerial Setting: General Description	Strongly emphasize sustaining and enhancing natural ecosystem with no development	Strongly emphasize sustaining and enhancing natural ecosystem	Emphasize sustaining and enhancing the natural ecosystem with limited development		
1. Contact with park staff	Infrequent	Minimum	Routine		
2. Rules and regulations	Will be communicated to visitors primarily outside of the backcountry at trailheads and ranger stations		When necessary, on-site enforcement and communications of rules and regulations will be conducted through regularly scheduled patrols		Primarily communicated at contact stations and huts
3. Formal and informal user education programs	Will be initiated to inform users about minimum impact use and what to expect for optimum benefit for all.				
4. Direct site management	Very limited--i.e plant large rocks to close site if impact exceeds standards	Very limited	Limited actions only as necessary to meet standards or objectives	Designated sites, closures, site hardening etc. as necessary to meet standards or objectives.	Maintain huts; otherwise limited actions to meet objectives or standards
5. Backcountry camping permits required	Required in all opportunity classes				
6. Level of trail maintenance	Managed to accommodate light use. Unmaintained trails may exist. No new trail construction.	Managed to accommodate light use. Unmaintained trails may exist. Limited construction of new trails.	Managed to accommodate moderate use and prevent resource damage	Managed to accommodate heavy use.	Maintained to high standards to accommodate heavy use.
7. Type of trail use	Foot/X-country ski. Horses on designated trails only.				Foot/X-Country Ski
8. Presence of administrative structures (cabins, huts, towers)	No non-historic structures allowed.		No new structures to be built.		Huts exist every 10-15 miles with several cabins and maintenance huts in non-wilderness. No new structures to be built.

COMPONENT	PRIMITIVE WILDERNESS (low use)	PRIMITIVE NON-WILDERNESS (low use)	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS (moderate use)	THRESHOLD WILDERNESS/ NON-WILDERNESS (high use)	APPALACHIAX TRAIL WILDERNESS/ NON-WILDERNESS
9. Presence of other structures (toilets, hit&racks, bridges,etc.)	Provide at the absolute minimum; in wilderness, permitted only as minimum requirement to meet purposes of wilderness (use Decision Tree)		A few permitted for resource protection or visitor safety only; in wilderness, permitted only as minimum requirement to meet purposes of wilderness (use Decision 'Tree).		
10. Presence of signs (*use backcountry sign guidelines)	Minimal signage: Resource protection, directional, and trailhead signs	Resource Protection, direction& trailhead, safety signs		Resource Protection, directional, trailhead, safety and interpretive signs	Resource Protection, directional, trailhead. and safety signs
11. Motorized vehicles and equipmeut	None allowed, except as permitted as minimum requirement to meet purposes of wilderness (use Decision Tree)	None allowed, except for motorized equipment use for trail maintenance and resource monitoring activities	Vehicles allowed on existing administrative roads for authorized use only; no roads exist in wilderness. Motorized equipment use permitted for administrative purposes in non-wilderness; motorized/mechanical uses not permitted in wilderness except as minimum requirement to meet purposes of wilderness (use Decision Tree).		
12. Administrative roads	None allowed		Only necessary and existing administrative roads in non-wilderness areas. No new roads to be constructed. No roads are permitted in wilderness.		None allowed except where trail crosses existing road.
13. Commercial Enterprises	None, except as permitted as minimum requirement to meet purposes of wilderness by Incidental Business Permit (IBP) or Concessions Agreement (use Decision Tree).	Permitted backcountry dependent activities by IBP or Concessions Agreement only	Permitted backcountry dependent activities by IBP or Concessions Agreement (use Decision Tree).		
line corridors	None allowed	As exists	As exists in non-wilderness only. None permitted in wilderness.		As exists in non-wilderness. None permitted in wilderness.

able 4.4

Standards for Resource Indicators for each Opportunity Class

INDICATORS	PRIMITIVE WILDERNESS	PRIMITIVE NON-WILDERNESS	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS	THRESHOLD WILDERNESS/ NON-WILDERNESS	APPALACHIAN TRAIL WILDERNESS/ NON-WILDERNESS
1. Number of informal trails to campsite.	No more than two.		No more than three.	No more than four.	No more than two
2. Total campsite size (square feet).	No greater than 200 square feet.		No greater than 800 square feet.	No greater than 1000 square feet.	No greater than 800 square feet.
3. Area of vegetation loss within campsite (square feet).	No greater than 25 square feet.		No greater than 225 square feet.	No greater than 600 square feet.	No greater than 225 square feet.
4. Area of soil exposure within campsite (square feet).	No soil exposure.		No greater than 120 square feet.	No greater than 400 square feet.	No greater than 120 square feet.
5. Number of campsites exceeding a particular condition class rating per 640 acres.	No sites within condition class 3 or above.		No sites within condition class 5. No more than two sites in class 4. No more than three sites in class 3.	No sites within condition class 5. No more than three sites in class 4. No more than five sites in class 3.	No sites within condition class 5. No more than two sites in class 4. No more than three sites in class 3.
6. Number of campsites per 640 acres.	More technical information is needed to develop practical and measurable indicators and standards for campsite densities and trail conditions.				
7. Trail Conditions.					

Table 4.5

Standards for Social Indicators for each Opportunity Class

INDICATORS	PRIMITIVE WILDERNESS	PRIMITIVE NON-WILDERNESS	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS	THRESHOLD WILDERNESS/ NON-WILDERNESS	APPALACHIAN TRAIL WILDERNESS/ NON-WILDERNESS
1. Amount of litter.	No amount of trash is acceptable and therefore a standard cannot be set.				
2. Noise	See narrative below.				
3. Number of trail encounters with other parties per day.	0 to 3 parties		0 to 12 parties	Any number of parties may be encountered	
4. Number of other parties camped within sight & continuous sound.	0 parties		0 to 2 parties	0 to 4 parties	0 parties except at huts; hut capacity should not be exceeded

The results of a backcountry visitor study (1997-1998) will be used to help address the social indicator, "noise." Standards of acceptable noise in the backcountry may be related to the number and distribution of campsites, the number of encounters with other groups at campsites, and aircraft overflight disturbances. The aircraft overflight issue has been surveyed in 1992 and survey results will be evaluated for possible application to a backcountry noise standard.

Future Action

A. Establish or refine resource and social indicators and standards.

B. Determine initial management actions to be taken to meet the standards established for opportunity classes.

4.3 Mapping of Opportunity Class "Zones"

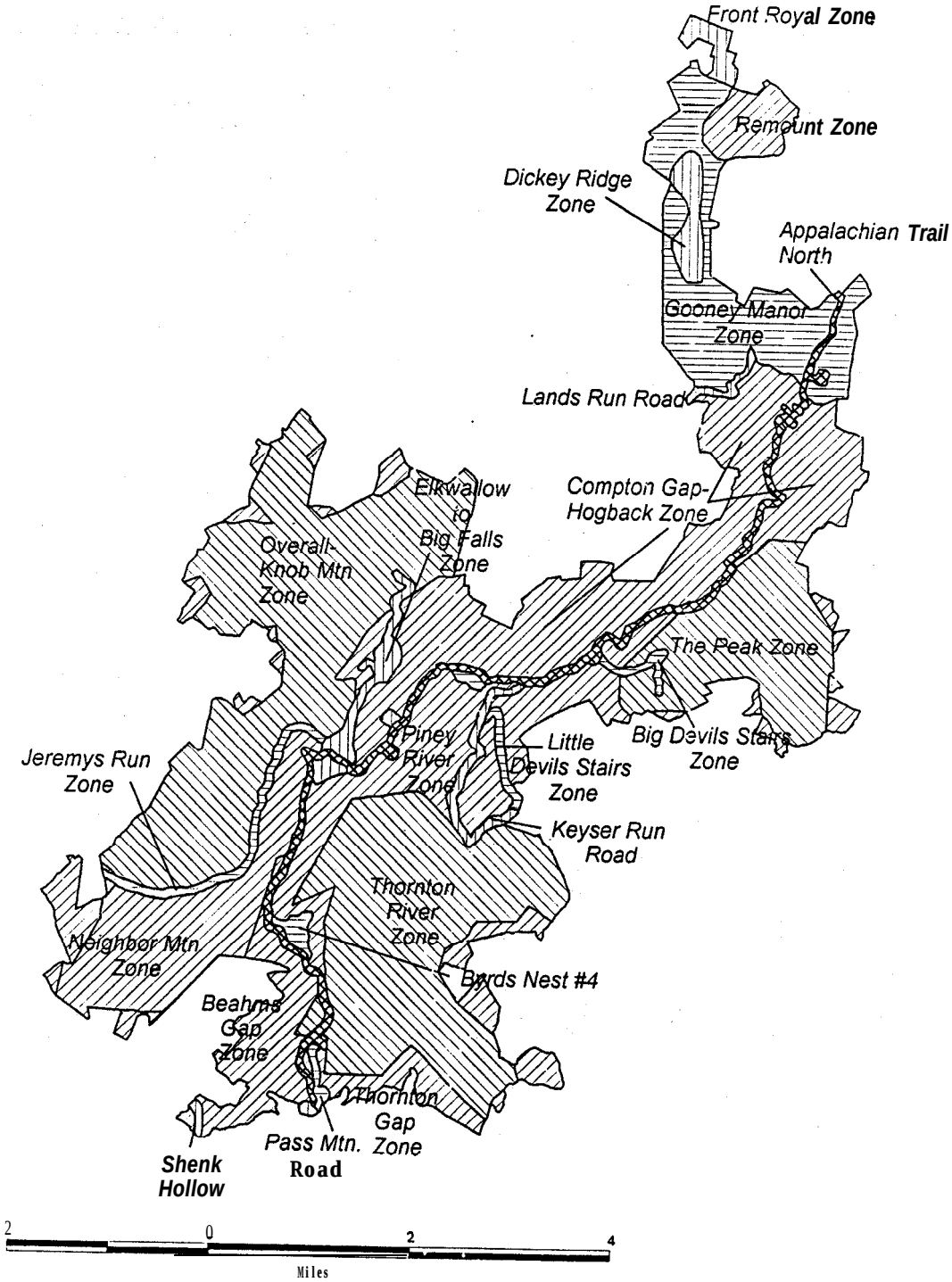
The opportunity classes as described in the management objectives have been mapped by the park's Geographic Information System (GIS) (see figures 4.6, 4.7, and 4.8, attached). Opportunity class mapping was performed by district backcountry field rangers familiar with general visitor use patterns and resource protection needs in the backcountry. The physical boundaries of the opportunity classes are generally not well-defined, but can be in the future if the need arises.

Future Action

A. Review, revise opportunity class maps to improve consistency in perceived "levels of use" between the districts.

Figure 4.6

Shenandoah National Park
North District
Recreational Opportunity Classes



Recreational Opportunity Class

- Appalachian Trail Wilderness and Non-wilderness
- Primitive Non-wilderness
- Ptimilive Wilderness
- Semi-primitive Wilderness and Non-wiiderness
- Threshold Wilderness and Non-wilderness

Figure 4.7

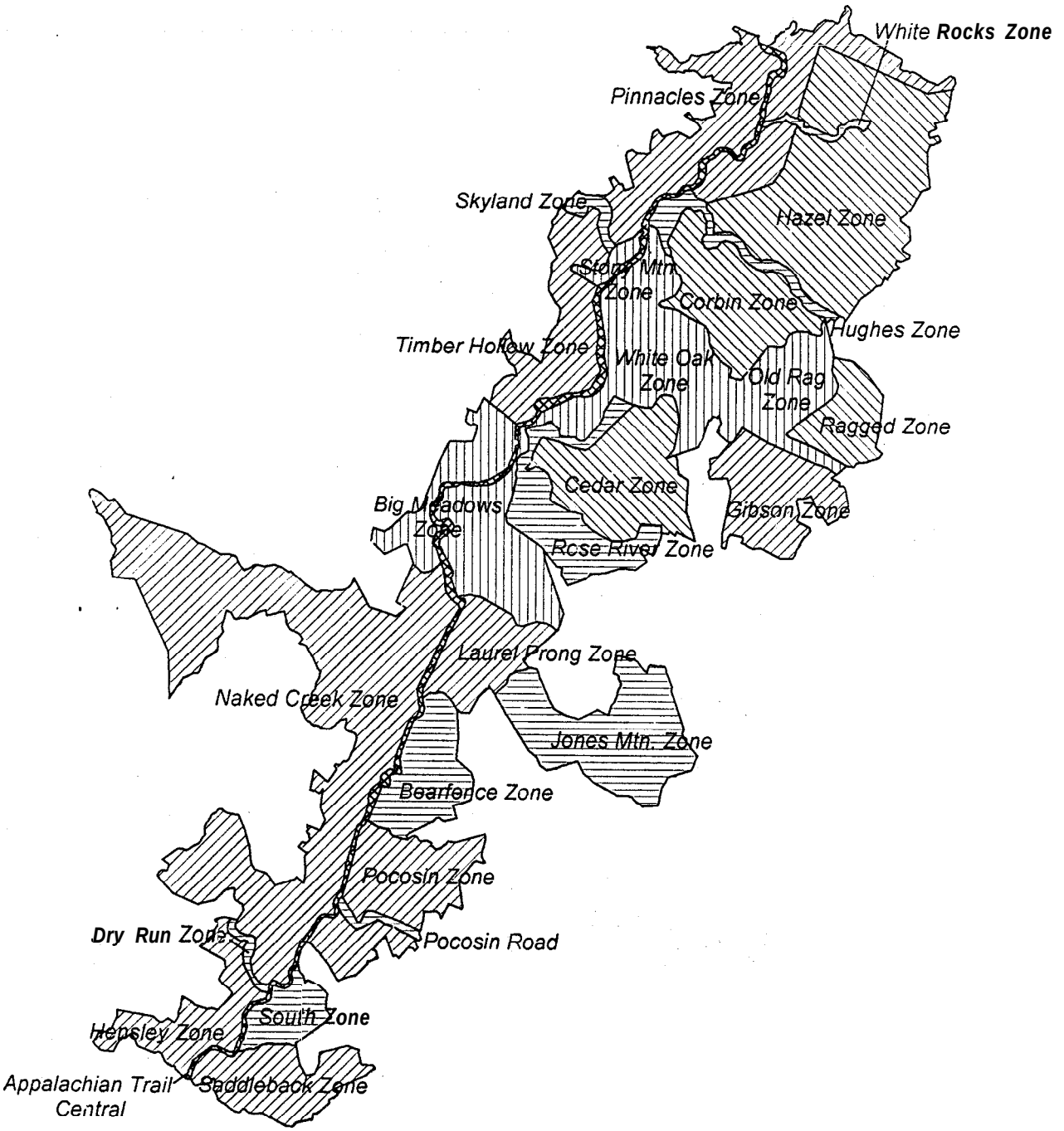
Shenandoah National Park
South District
Recreational Opportunity Classes

Recreational Opportunity **Class**

- *Appalachian Trail Wilderness and Non-wilderness*
- *Primitive Non-wilderness*
- *Primitive Wilderness*
- *Semi-primitive Wilderness and Non-wilderness*
- *Threshold Wilderness* **and** *Non-wilderness*

Figure 4.8

Shenandoah National Park
Central District
Recreational Opportunity Classes



Recreational Opportunity Class

- Appalachian Trail Wilderness and Non-wilderness
- Primitive Non-wilderness
- Primitive Wilderness
- Semi-primitive Wilderness and Non-wilderness
- Threshold Wilderness and Non-wilderness

CHAPTER 5
WILDERNESS MANAGEMENT POLICY

5.1 Wilderness Concept and Principles

Brief descriptions of the Wilderness Act of 1964 and authorization of eastern wilderness areas in 1975 are found at chapter 1.6. A detailed historical and philosophical perspective of SNP wilderness designation is found in a collection of materials compiled by former Superintendent Robert R. Jacobsen in an October 1983 memorandum entitled "Wilderness Management Plan."

National Wilderness Concept and Administration

Public perceptions of wilderness vary widely; some urbanites with little experience in the natural environment might perceive wilderness as any undeveloped wildland. Some people perceive wilderness as a place unmodified by human development not unlike the North American continent prior to European settlement. The concept of "wilderness" has deep, worldwide historical roots. People from different cultures may have widely different perceptions of wilderness. Wilderness was long debated by the U.S. Congress during development of the 1964 Wilderness Act and wilderness quality and value continues to be examined and debated.

The rationale and philosophy of the wilderness concept have been eloquently described in the written works and actions of Aldo Leopold, John Muir, Arthur Carhart, Bob Marshall, David Thoreau, among many others. More recent writers such as Roderick Nash and Michael Frome have further examined the modern concept of wilderness. The actions and determination of scientists, government employees and citizens with strong wilderness stewardship principles, including Howard Zahniser, Benton Makaye, William Whorf, Tom Kovalicky, and Paul Weingart, just to name a few, have advanced the protection and preservation of wilderness. An entire textbook dedicated. to management of the wilderness resource, Wilderness Management, has been published. Many publications reporting a wide range of wilderness research are readily available. Organizations such as the Wilderness Society, Wilderness Watch, and the International Wilderness Leadership Foundation are dedicated to the understanding and preservation of wilderness. A number of other national organizations, such as the George Wright Society, Sierra Club, Audubon Society, and the National Wildlife Federation also dedicate much of their energy to preservation of wilderness quality. Organizations including the National Outdoor Leadership School (NOLS) and Outward Bound conduct wilderness-based experiential programs for the public while also teaching wilderness conservation skills and ethics. Many wilderness recreationists are familiar with the NOLS national education program called Leave No Trace whose mission is to educate wildland user groups, federal agencies and the public about minimum-impact recreation.

The National Wilderness Preservation System (NWPS) is administered by four of the federal land management agencies: the USDA Forest Service, USDI Bureau of Land Management, Fish and Wildlife Service, and National Park Service. The Arthur Carhart National Wilderness Training Center is managed cooperatively by these agencies and is dedicated to achieving excellence in wilderness field management. The Aldo Leopold Wilderness Research Institute was formally established in 1993 to bring focus to ecological and human dimensions research

relevant to understanding and managing wilderness resources. This institute is located on the campus of the University of Montana in Missoula. Wilderness-based education is available at a number of universities. A comprehensive wilderness education correspondence course is available through the University of Montana.

SNP Wilderness Designation

Protecting and preserving wilderness quality is a difficult challenge, particularly at SNP because of its popularity and proximity to major population centers. Wilderness is the least modified, or "primeval 'l extreme on the spectrum of land uses. Wilderness is sensitive to a wide variety of human impacts, including impacts from adjacent non-wilderness lands in highly developed and conflicting land uses. SNP is in a unique position of providing eastern wilderness land which is largely protected by adjacent NPS non-wilderness land use. Except for those wilderness areas in close proximity to non-conforming uses on privately-owned lands on park boundary, wilderness area is bounded and protected by park backcountry in similar use.

Within 30 years of Park establishment, by the 1960's the SNP forests had returned to a primarily forested condition after having been extensively logged, burned, farmed, grazed, mined, and inhabited and built upon by several generations of people. Superintendent Taylor Hoskins and later on Superintendent Robert Jacobsen recognized that the forests had "recycled" from prior human use and could be considered to possess those qualities described in the Wilderness Act and, upon its creation, the "Eastern Wilderness Act."

Upon Jacobsen's arrival at the Park in 1972, he "found Congress in the initial stages of a 5-year long debate on how much of the Park should be officially designated as a portion of the Wilderness Preservation System." Also, "Backcountry use was exploding in 1972.. . Shenandoah was trying, like many other park and forest areas, to accomodate this use in the classical manner-- by concentrating overnight use and hardening the impacted sites. But the system wasn't working.. . Overnight solitude was rare and hard to find, sanitation problems were developing, and on busy weekends the designated campsites took on the appearance of county fairgrounds. " A campsite "dispersal" system was pioneered and, together with backcountry regulations designed to prohibit or restrict a few traditional and destructive backcountry practices, a system of keeping impacts to "acceptable levels" proved to be suited for later wilderness designation, As wilderness designation was debated hotly locally and in Congress, Jacobsen strained for guidance in addressing such concerns as "how, for example, could a wilderness manager assure the retention of "primeval character and influence" in "mini-wilderness" areas.. . " and, "How could a wilderness manager provide a place for "physical and mental challenge" in small wilderness areas that are within sight and sound and smell of major highways, private lands, and residential and industrial development; and how could a wilderness manager provide opportunities for "solitude" and "inspiration" where high levels of day use are already firmly established without imposing very costly and highly unpopular systems for rationing use?"

Jacobsen struggled with the concept of high volumes of visitor use occurring in some proposed SNP wilderness. He noted a "major conceptual breakthrough" in 1976 when the Department

of the Interior officially notified the Senate Subcommittee on Parks and Recreation that it was planning to recognize three types of wilderness. One of the three types was described as, "Still other areas of wilderness have a number of constructed trails and are within a short distance of access roads. These areas typically appeal to novices or families with young children and are used primarily for a few hours to a day or two. This type of wilderness receives moderate to frequent use, requires the highest degree of management and maintenance of the three, and could be referred to as zone I." According to Jacobsen, "An earlier memorandum had already noted that all of the proposed wilderness in Shenandoah would be of the last type" (zone I). Jacobsen further stated that he was comfortable with the idea that "... heavy use could continue to occur along established trail corridors within the park's designated wilderness areas so long as overnight use could be sufficiently well-dispersed to keep its social and resource impacts within acceptable limits." While the three levels of wilderness proposed by the Department apparantly did not materialize as policy, the legislative history and management direction of SNP wilderness was initially established in this concept.

According to a 1975 Department memo, as the SNP wilderness Congressional hearings continued through 1975 significant public concern was expressed "that wilderness designation of the White Oak Creek and Old Rag Mountain areas in Shenandoah National Park would be detrimental due to the possible restriction which would be placed on the number of visitors permitted in these areas under wilderness management practices. Further, allegations are made that we would not be able to provide and maintain foot and horse trails commensurate with the public's desire to use these areas." The House of Representatives voted in favor of designating wilderness, and resulted from the Senate's action of attaching its version of this proposal to an omnibus measure for the designation of wilderness in several other NPS areas. Senator Harry Byrd of Virginia assured that the proposal included non-wilderness corridors in the Old Rag, White Oak Canyon and Rose River areas of Madison County. A l-acre non-wilderness area was established around the Corbin Cabin (Central District) due to its use as a rental cabin by the PATC; the cabin was determined to "provide visitor conveniences which exceed those suitable in wilderness" and constituted a "commercial enterprise which is prohibited by section 4(c) of the Wilderness Act."

Congress designated approximately 79,019 acres of "Shenandoah Wilderness" in October, 1976, in three areas and eleven separate parcels. Jacobsen states, "We recognized, through its relatively small size, its already established levels and patterns of visitor use, and the presence of immediately adjacent non-conforming land use activities, that our wilderness area was not of the highest order-- and immediately adopted a "non-degradation" policy. .." and, while our wilderness is not supreme, we will not allow its primeval character, and its opportunities for solitude, inspiration, and physical and mental challenges to decline. Furthermore, we will strive, and might be able, to improve its overall quality." For the next year and a half the wilderness designation was implemented according to a schedule which included such activities as shelter removal, establishment of bear-proof concrete trail signposts at trail junctions, removal of all other signs, removal of man-made water developments, closure and rehabilitation of "fire" roads and permanent blockage of closed roads. Additional removals and administrative transference of special access permits to other roads enabled the Park to designate an additional 560 acres of potential wilderness as wilderness through publication of a Federal Register notice

in September, 1978, for a total wilderness acreage of 79,579.

Presently, general guidance for management of SNP wilderness can be further provided by Wilderness Management which states: "Wilderness management is essentially the management of human uses and influences to preserve naturalness and solitude. It includes everything done to administer services; the formulation of goals and objectives, and all policies, standards, and field actions to achieve them." Also, "Wilderness management should not mold nature to suit people. Rather it should manage use and influences so as not to alter natural processes. Wilderness managers should do only what is necessary to meet wilderness objectives and use only the minimum tools, regulation, and enforcement required to achieve those objectives.", SNP wilderness management and stewardship intends to follow this philosophy. However, SNP wilderness managers must grapple with the great popularity of some of its wilderness destination sites and easy access to wilderness provided by the Skyline Drive, numerous boundary access points, and hundreds of miles of trails.

SNP wilderness conditions as those described in the "zone I" concept are inherent in SNP wilderness designation. The BWMP strives to describe specific management objectives for SNP backcountry and designated wilderness by identifying standards (Jacobsen's "acceptable limits") and managing limits of acceptable change to resources and the visitor experience. As SNP wilderness management philosophy evolves to a more "pure" or biocentric interpretation of the Wilderness Act, SNP wilderness managers must address rationing of visitor recreation use (particularly day use) and substantial changes to visitor services (ie. quality of emergency operations) and facilities (ie. trail conditions and standards). However, a strictly anthropocentric viewpoint would focus on human conveniences in the wilderness environment, perhaps leading to the loss of a most essential wilderness quality, naturalness. Details of management may vary among wildernesses, and Wilderness Management, in noting the range for debate on biocentric versus anthropocentric emphasis in wilderness management, provides a statement by the late Senator Frank Church (floor manager of the Wilderness Act when it passed the Senate and former chairman of the Interior Subcommittee on Public Lands):

> ". . . if purity is to be an issue in the management of wilderness, let it focus on preserving the natural integrity of the wilderness environment - and not needless restriction of facilities necessary to protect the area while providing for human use and enjoyment."

Wilderness Management continues that "Our hope is that the philosophy that ultimately prevails will emphasize the natural integrity of wilderness ecosystems, with common-sense applications that respond to the needs of individual areas."

SNP wilderness management philosophy tends to the "pure ", or biocentric interpretation of the Wilderness Act. At SNP, we will strive to maintain --or where necessary create-- the quality of the wilderness experience described in the Wilderness Act, and minimize degradation of resources. High use may need to be restricted in order to meet these objectives, in addition to methods discussed elsewhere in this plan for dispersing use and limiting impacts. While common sense must be used, NPS managers have a legal obligation to keep these values foremost in our management of wilderness.

General guidance for wilderness management is provided within the Wilderness Act itself and more specific direction is included in NPS Management Policies (Chapter 6). SNP wilderness management objectives and descriptions of opportunity classes (management zones) are provided in chapter 4 of the BWMP.

SNP Wilderness Management Accountability

While all SNP employees, volunteers, researchers, and others interacting with the wilderness resource have Wilderness stewardship responsibility, wilderness management accountability at SNP is clearly defined in the park's management organization. The Superintendent is ultimately responsible for the park's wilderness program. The Division Chief for Natural and Cultural Resources directs the park's Branch Chief for Backcountry, Wilderness, and Trails Resources, who serves as the parkwide Backcountry and Wilderness Manager. The Backcountry and Wilderness Manager assures that this BWMP is adhered to and periodically updated and refined. This position coordinates the "minimum requirement" policy using the tools as described in chapter 5.2.

5.2 "Minimum Requirement"

Section 4 of the Wilderness Act says:

> Except as specifically provided for in this Act, and subject to existing private rights, there'shall be no commercial enterprise and **no** permanent road within any wilderness areas designated by this Act and, **except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act** (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area. (bold supplied)

NPS Management Policies, Wilderness Preservation and Management, provides direction for management techniques in NPS wilderness:

> In protecting wilderness character and resources and in managing wilderness use in accordance with the Wilderness Act, the National Park Service will adhere closely to the "minimum (requirement)" concept. Superintendents, in accordance with the wilderness management plan, will select the minimum tool or the administrative practice necessary to successfully and safely accomplish the management objective with the least adverse impact on wilderness character and resources. All decisions pertaining to administrative practices and use of equipment in wilderness will be based on this concept, Potential disruption of wilderness character and resources and applicable safety concerns will be considered before, and given significantly more weight than, economic efficiency. If some compromise of wilderness resources or character is unavoidable, only those actions that have localized, short-term adverse impacts will be acceptable.

Furthermore,

> Administrative use of motorized equipment or mechanical transport . . . will be authorized in accordance with the park's wilderness management plan only (1) if determined by the superintendent to be the minimum required action needed by management to achieve the purposes of the area, or (2) in emergency situations involving human health or safety or the protection of wilderness values. Such management activities will be conducted in accordance with all applicable regulations, policies, and guidelines and, where practicable, will be scheduled to avoid creating adverse resource impacts or conflicts with visitor use. (Chapter 6:4)

NPS Director's Order #41 (draft, 1998) explains that "minimum requirement" is the documented process used to determine if uses and activities otherwise prohibited by the Wilderness Act can be allowed and, if they are allowed, the most appropriate methods to complete those actions within wilderness. In order to allow a prohibited activity, the activity must be necessary to manage the area as wilderness.

The minimum requirementprocess applies to ALL administrative actions, programs, and activities within wilderness. This BWMP provides a **SNP Wilderness "Minimum Requirement" Decision Tree** (Appendices, chapter 16.7) which provides systematic guidance for wilderness management decision making in considering minimum requirement alternatives. If a "project" which will affect wilderness is being considered, the Decision Tree is also used in conjunction with the SNP Project Clearance Form (PCF), an internal park planning process used to review and document projects for environmental and cultural compliance.

5.3 Recreational Use

The Wilderness Act provides for the enjoyment of wilderness by people. The act states: "It is ... the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness." Wilderness managers are legally mandated to produce the important benefits which wilderness provides to people. Wilderness recreation management, including management of associated facilities, should conform to SNP wilderness philosophy, as described above in chapter 5.1 and as stated in management objectives in chapter 4.

Day hiking and overnight camping are wilderness-dependent recreational activities which encompass nearly all visitor use within SNP wilderness. Rock climbing occurs at some of the more accessible cliff sites. Recreation using mechanized equipment, such as bicycles and mountain bikes, and use of aircraft such as hang gliders are prohibited in wilderness. Use of motorized vehicles and equipment is prohibited. Pack animals are permitted and, as elsewhere in the backcountry, are restricted to those trails which are blazed with yellow paint.

Trails

Typically, visitors use trails to access and travel through wilderness areas. As stated by former NPS Director Gary Everhardt at Congressional hearings in 197.5,

> Trail management is critical to providing for use that does not diminish the wilderness resource through which the trails pass. Trail location, maintenance, and use are all vital elements. An essential aspect of wilderness management is flexibility to change use patterns as necessary to protect resources and to achieve other management objectives. This may include closing some trails and constructing new ones at new locations within wilderness.

Although specific standards for trail conditions and management techniques may differ slightly between opportunity classes, wilderness trails are generally maintained so that hikers or riders may pass in single file. Wilderness trails and boundaries are not signed or marked as such (this may change in the future; see chapter 6.8, Future Actions). Trees are marked with blue, yellow, or white blazes in the trail corridor to identify the trail type to the user and to a much lesser purpose to guide the novice wilderness user. Blazing is maintained on wilderness trails in accordance with the management expectation that a wide range of user experience and skills are prevalent on even the "remote" wilderness trails. While some trail "hardening" (improvements such as rock steps, erosion control devices using natural materials, etc.) may be desirable and perhaps necessary to mitigate resource damage and other problems caused by heavy visitor use, paving of trails is not permitted. Management Policies states that although the development of facilities to serve users will generally be avoided, campsites may be designated when essential for resource protection or enhancement of opportunities for solitude; restrictions on these facilities in wilderness are also described.

Further description of management objectives for wilderness recreation is found in chapter 4, general recreation activity information is provided in chapters 2 and 7, and trail maintenance standards and techniques are described in chapter 8.

5.4 Research, Monitoring, and Resource Management

NPS Management Policies, Wilderness Preservation and Management, provides direction for research and monitoring activities in SNP wilderness:

> In every park containing wilderness, the conditions and long-term trends of wilderness resources will be monitored to identify needs for, and results of, management actions... [E]very wilderness monitoring program will not only assess physical and biological resources, but also identify what impacts people have on resources and values and what impacts they have on other people using the wilderness. These monitoring programs will also be designed to identify whether or not wilderness resources are being impacted by human activities outside the wilderness, and if so, to determine the nature, magnitudes, and probable sources of those impacts...

The statutory purposes of wilderness include scientific and educational use, and the National Park Service will fully support the value of wilderness areas as natural outdoor laboratories. A research project may be conducted in wilderness if it rneets all of the following requirements:

The research activities are otherwise allowable under federal laws and regulations.

There is no alternative to conducting the research in a wilderness area.

The project will not adversely affect physical or biological resources, ecosystem processes, or aesthetic values over an area or duration greater than necessary to meet research objectives.

The project will not interfere with recreational, scenic, or conservation purposes of the wilderness over a broad area or long duration.

Hydrologic, hydrometeorologic, seismographic, and other research and monitoring devices may be installed and operated in wilderness only upon a finding that (1) the desired information is essential and cannot be obtained from a location outside of

accomplish the objective safely and successfully. Devices located in wilderness will be removed when determined to be no longer essential.

The long term protection of an area requires a level of understanding which sometime requires on-site investigations. The scientific understanding of a wilderness area is a value of the wilderness and aids in its preservation. It is imperative, however, that the benefits of what may be learned outweigh any negative impacts on other wilderness values.

SNP has made a major commitment to natural resources inventory and monitoring (see chapter 10.3). Research and monitoring activities will be encouraged in wilderness areas in the park, *provided they meet the guidance from NPS Management Policies above.* Methods which minimize the impact of research and monitoring on wilderness values will be used where available. When possible. non-mechanized means and non-destructive sampling procedures shall be used to gather needed research and monitoring information. If mechanized means (e.g. backpack electrofishing devices to monitor fish communities in wilderness streams) or destructive sampling procedures are the only practical means of acquiring needed information in wilderness, they shall be reviewed and documented using the parkwide clearance process.

Research and monitoring activities proposed in wilderness areas by non-park investigators shall be reviewed according to the park's research guidelines, which address proposal formats, peer review/quality assurance, collections, permits, and reporting. Wilderness values are specifically addressed in the review criteria, consistent with this chapter. Projects, if meeting permit criteria, will be submitted on parkwide clearance forms.

All research and monitoring activities in wilderness will be documented in the park's Resource

Management Plan and (when appropriate) Investigator's Annual Report. Long-term records will be maintained by the staff of the park's Division of Natural and Cultural Resources.

Natural Resource Management

Natural resource management activities in SNP wilderness, other than research and monitoring described in the previous section, shall be limited to restoration of ecological integrity and mitigation of existing or potential resource degradation caused by human activity. As the need for these actions will frequently be identified as a result of the research and monitoring activities, the same criteria, restrictions, and documentation guidelines shall apply.

Cultural Resource Management

Historic structures, cultural landscapes, objects, and other cultural resources exist in wilderness areas within SNP. Cultural resources within designated wilderness areas will be protected in accordance with Federal law. Wilderness designation, in and of itself, shall not affect the NPS' cultural resource management responsibilities.

Cultural resource management actions, however, shall not adversely affect the overall wilderness character of the area. Cultural resources in wilderness will be inventoried, monitored, and evaluated. Scientific inquiry and use will be evaluated and permitted according to the same criteria (*vis* a *vis* wilderness) as for natural resources. Cultural resource investigation will be evaluated by policies established in NPS-28 (Cultural Resource Management Guidelines) or in accordance with the Archeological Resources Protection Act (ARPA). While this does not mean that all cultural resources will be preserved, significant cultural resources may be protected from human-caused or natural deterioration. Stabilization, archeological investigation, and similar survey and/or protection activities may be approved on a case-by-case basis by the superintendent and appropriately documented in the park RMP and other long-term records. As with natural resources, methods that temporarily infringe on the wilderness character of an area, resulting in unavoidable, localized, short-term impacts, may be approved only if alternate methods are not available.

5.5 Emergency/Fire Operations

Emergency Operations

According to NPS Management Policies, "The saving of human life will take precedence over all other management actions." In regard to wilderness, emergency operations may require some reliance on motorized equipment as the minimum requirement for search and rescue purposes. Historically, SNP has not opened roads into wilderness to facilitate a rescue by motorized vehicle; this is a difficult ethical issue, but the proximity of SNP wilderness to roads at park boundary and the Skyline Drive seem to provide the accessibility which has made evacuation of patients by Stokes litter to be most effective. Chainsaw equipment might be used to quickly clear an existing but sparsely maintained wilderness trail to facilitate an evacuation. Again citing Management Policies, "... park visitors assume a certain degree of risk and responsibility for their own safety when visiting areas that are managed and maintained as natural, cultural, or recreational environments." While this degree of risk and responsibility by the park visitor has

not been specifically determined, the visitor should assume the highest degree of risk and responsibility in the Park's wilderness areas which are managed primarily for the preservation of natural conditions. The SNP Emergency Operations Plan provides some information on these issues.

Wildland Fire Operations

The SNP Wildland Fire Management Plan (FMP) does not specifically address fire management in Park wilderness area. Fire suppression strategies and tactics are described in the FMP for the Natural Zone, of which the Wilderness Subzone is a component. The FMP and NPS-18, Wildland Fire Management, do describe minimum impact suppression tactical (MIST) guidelines and fire site rehabilitation and restoration techniques which are generally compatible with wilderness management objectives.

Management ignited prescribed fire is a natural resource rnanagement activity which can be used to restore the ecological integrity of SNP wilderness areas. Human activity including the immediate suppression of all wildland fire has resulted in accumulations of fuels in some wilderness areas. A management objective of the FMP is: "To perpetuate natural resources and processes, as naturally influenced by fire within the Park." The FMP states: "A program that allows suppression actions to be taken in an otherwise natural fire unit may be augmented by a program of management ignited prescribed fire, in order to reduce fuel accumulations and duplicate natural processes. The program allows management ignited prescribed fire to achieve resource management objectives." The FMP provides a description of projects, strategies, and guidelines for SNP management ignited prescribed fire.

Future Actions

A. Assure that future revision of the SNP Wildland Fire Management Plan addresses preservation of wilderness resources and that all fire operations in wilderness will be managed in keeping with the application of the "minimum requirement" concept.

CHAPTER 6
FACILITIES

6.1 Shelters

In the early 1970's, there were 21 trailside shelters in Shenandoah National Park. Seventeen had been constructed in the 1930's and those which remain are historic. During the 1960's four additional shelters, the "Byrds Nests" donated by the late Senator Harry F. Byrd, were added. These shelters were available for overnight use by any and all hikers on a first-come-first-served basis. Due to overuse of the shelter areas, in 1974 all shelters were closed to overnight use except for emergency situations. In 1979 and 1980 several of the shelters were converted into the present day Appalachian Trail "huts" for use by long distance hikers (see chapter 6.3) and some were removed.

Currently, there are five three-sided "shelters" in the Park with four in the Central District and one in the North District. These include the Old Rag Shelter and the four "Byrd's Nests" shelters. These shelters are available for day use and emergency shelter only and are not available for overnight camping. Fires are only allowed in the fireplaces provided. Not all of the shelters have fireplaces.

Shelter	District	Location	Fireplace
Old Rag	Central	Saddle Trail	yes
Byrds Nest 1	Central	Saddle Trail	yes
Byrds Nest 2	Central	Hawksbill	no
Byrds Nest 3	Central	Meadow Spring	yes
Byrds Nest 4	North	Neighbor Mtn.	no

The shelters are allowed in the Semi-Primitive Non-wilderness and Threshold (Non-wilderness) opportunity classes only. No new shelters will be built, and the existing shelters will be minimally maintained.

Future Actions

A. Evaluate the need for continued maintenance of the administrative roads leading to shelters. Maintain abandoned roads as trails (assure rehab/erosion control of closed or abandoned roads).

0. Evaluate removal of existing toilets, fireplaces, and protected water supplies at shelters. Schedule and perform removal of facilities as deemed appropriate.

6.2 PATC Cabins

The PATC, authorized by a Concessions Permit, maintains and operates six rental cabins in various backcountry locations. The cabins may be reserved by PATC members and non-members through the PATC headquarters. A small land parcel around each facility is assigned to PATC for use and maintenance. Sanitary facilities, consisting of a single pit privy, are

provided and maintained by the PATC at each cabin.

Cabins are located in the Semi-primitive, Threshold, and Appalachian Trail opportunity classes only. Existing cabins include Range View in the North District, Corbin, Rock Spring, Jones Mountain, and Pocosin in the Central District, and Doyles River in the South District. ~~Only Corbin Cabin in the Central District is found within a designated wilderness area~~. Ail of the PATC cabins are believed to be eligible for the National Register of Historic Places. No new cabins will be constructed in the Park.

The use of cabin facilities does not require a backcountry camping permit. Cabin users are required to properly store all food supplies either by keeping food inside the cabin or by abiding with backcountry food storage regulations and hanging it out of reach of wildlife outside. No poisons, fungicides, or insecticides may be used for pest control without prior written approval from the park IPM coordinator. Standing trees, whether dead or alive, may not be cut except upon administrative requirement (ie. hazard tree) by Park personnel. Dead wood found on the ground may be gathered as firewood.

Future Actions

A. Continue to monitor the supply of downed firewood and work with PATC to develop alternative heat/fuel sources for the cabins.

B. Standardize all Park and PATC signs for the cabins.

C. Continue to monitor the grounds around the cabins for buildup of charcoal and cooperate with the PATC in educating cabin users to employ minimum impact practices around cabin areas.

6.3 PATC Huts and Maintenance Buildings

As authorized by the Concessions Permit, the PATC operates and maintains 7 huts and 3 maintenance buildings in the Appalachian Trail opportunity class. All of these structures are considered as eligible for the National Register of Historic Places. Due to consideration of AT user expectations and experience, the provision of huts is allowed and accommodates this traditional use while minimizing campsite impacts to the resources immediately adjacent to the AT. The trail user can generally expect a day's hike (8 to 12 miles) between huts.

In contrast to the PATC cabin use, those hikers using huts are required to obtain a backcountry camping permit. The hut system is intended to provide shelter only for long-term hikers (at least three nights of backcountry camping) and specifically AT long distance "thru-hikers." Except in an emergency situation, only one night's lodging is permitted per hut. The huts are operated on a first come, first served basis. Bunk space in the huts is available according to the designated occupancy capacity as signed at each hut. If a hut is occupied at the capacity limit, additional visitors must camp out of sight in compliance with backcountry regulations. Huts may have nearby designated campsites for hut user overflow, but hut area regulations and guidelines pertaining to long-term hikers and length of stay apply.

The huts are three-sided stone or log structures with wooden sleeping platforms. An open outdoor fireplace is provided for cooking, and dead wood found on the ground may be gathered as firewood. Water is generally available from a nearby stream or spring but should be treated for water-borne contaminants before using. A pit toilet and bear-proof food storage pole are provided. No other facilities are available. A copy of the hut rules and emergency notification procedures are posted at each hut.

Table 6.1

Hut Locations	District	Capacity	Approx. Mileage South of Compton Gap via AT	Approx. Mileage North of Rockfish Gap via AT
Gravel Springs	North	11	12	91
Pass Mountain	North	7	25	78
Rock Springs	Central	10	40	63
Bearfence	Central	10	51	52
Hightop	south	7	63	40
Pinefield	South	7	71	32
Blackrock	South	11	83	20

Three PATC maintenance buildings are located within the backcountry at Indian Run in the North District, South River in the Central District, and Ivy Creek in the South District. These buildings are shelters which are enclosed and locked and serve as bases of operations and tool storage depots for the PATC's ongoing trail maintenance activities. Use of the buildings is not available to the general public and visitors must camp out of sight of these facilities. PATC overseers have permitted vehicle access to cabins, huts, and maintenance buildings only for transporting building maintenance materials or supplies for scheduled trail crews. PATC vehicle travel must be kept to an absolute minimum on administrative roads. **A** PATC overseer sign should be clearly displayed on the dash of the vehicle so that the vehicle use is immediately apparant to visitors and Park employees. Additionally, larger PATC trail crews which exceed occupancy capability of maintenance buildings and cabins are allowed to use tents in grassy areas in the immediate area of the PATC facility land assignment. This use is considered to be infrequent.

6.4 Camp Hoover

Camp Hoover is a historic facility along the Rapidan River built in 1929 by President Hoover. The President's Cabin, The Prime Minister Cabin, and the Creel Cabin have been designated as National Historic Landmarks. The landscape around the cabins and the archeological remains at the former marine camp above Hoover also are part of the National Register significance.

Camp Hoover falls within the Threshold opportunity class. Until 1992, the President, Vice President, Cabinet members, and their respective staffs, and members of Congress were allowed to rent the facility. In 1996, the NPS decided to limit the future use of Camp Hoover to assure preservation of the cultural fabric. The area will continue to have interpretive significance through events like Hoover Days and other scheduled activities.

In addition to the structures, several old walking trails in the area including the Fisherman's Loop and the trail up to the Five Tents area have been re-established. A significant resource problem which has recently impacted the health of the predominately hemlock forest surrounding the Hoover strucures is an infestation of the exotic Hemlock Wooly Adelgid (HWA). Integrated pest management actions including application of pesticides have been taken, but the hemlock stand continues to decline and mortality of several trees has forced their removal. As there are currently no known long-term protective strategies available against HWA, major changes in the overstory are expected in this area.

6.5 Hazard Trees at Facilities

A hazard tree is defined as a dead tree (dead longer than two years) or a live tree with a recognizable and significant structural defect, damage or lean that is in proximity of a high-use or relatively high-use public area and which presents an imminent risk to people or property.

Much of SNP's even-aged forest has matured since the park's establishment and subsequent forest protection in the 1930's and some stands are in decline and weakened, making them susceptible to insects. disease and storm damage. In the past decade, many thousands of trees have been killed due to insect infestations (especially Gypsy Moth and Southern Pine Bark Beetle) and severe storms. In response to recognition of the hazard tree danger posed to park visitors and employees in high-use areas, a formal SNP hazard tree management policy was developed to address hazard tree management strategies.

The existence of standing dead trees is part of the natural scene across the park; given the nature of the park's mission, management objectives and funding, there is no intention to render the entire park without risk from falling trees or limbs.' Efforts to identify and deal with hazard trees are performed in a priority fashion to optimally utilize available resources. **The goal of hazard tree management is to reduce the threat of falling trees in areas of the park where**

The task is impossible, practically speaking, given the vast acreage and steady natural recruitment of standing dead trees. Even if unlimited funding were available for this purpose, we would not choose to cut down all standing dead trees since they provide important benefits to the forest ecology in the form of habitat for various forms of flora and fauna.

the most people and property are at greatest risk, and to adequately warn the public and staff of remaining dangers. "Action priority zones" have been identified to focus hazard tree mitigation activities and backcountry "development" areas including trails, campsites, structures, and roadsides are placed in the lowest priority category for action. The "relative proximity limit" is defined for backcountry developments as "when a tree or limb may fall on to a backcountry structure or other commonly used area."

Staff and visitors need to be kept aware of hazard tree dangers. Publications for backcountry users such as campers and anglers need to carry information about hazard tree dangers and advisory signs should be posted at trailheads in the vicinity of large areas of dead trees. Monitoring for hazard trees at backcountry facilities is conducted on an ongoing basis by trail crew and other backcountry personnel.

6.6 Cultural Resources

The management of SNP cultural resources is described in the RMP. The RMP describes the four types of cultural resources as archeological sites, historic structures, cultural landscapes, and archival records and museum objects. According to the RMP, the current program for cultural resources management in SNP operates with the following general priorities: (1) protect and maintain National Register properties, (2) preserve the oral and written record of the area's history, (3) preserve other historic property including archeological sites, (4) maintain historic objects and archives, and (5) conduct further research on the park's cultural history. SNP is responsible for the protection of all historic structures and archeological sites and for the interpretation of cultural resources. All of these activities are carried out with a mixture of NPS operations (ONPS), cultural and regular cyclic, and Cultural Resource Protection Program (CRPP) funding.

A brief description of backcountry cultural resources and a general history of the SNP area is provided in chapter 2. The GMP provides a Cultural Resources Survey map which indicates resources by two major themes: (1) pre-park settlement and cultural patterns and (2) federal development subsequent to park establishment.

Historic Structures

Relevant to SNP backcountry management, the three remaining cabins (President's Cabin, Prime Minister's Cabin and The Creel) and associated cultural landscape at Camp Hoover, Corbin Cabin, the Jones Mountain Cabin, PATC cabins, maintenance buildings and shelters are the only backcountry structures presently determined eligible for the National Register of Historic Places. Camp Hoover is a National Historic Landmark. The open area at Big Meadows is an historic site.

As noted in the GMP, the historic structures and sites in the park backcountry may not warrant preservation, but all are subject to individual National Register evaluation, survey, and recordation if development would impact upon them. These structures, including the remains

of homesites, mills, cemeteries, mines, churches, and hotels, have yet to be individually evaluated, although they are being allowed to melt into the landscape.

Several cemeteries are maintained in their present state and receive minor maintenance attention from descendants of mountain families. Burials are permitted until the designated cemetery size is filled. A gate key for caretakers to access some cemeteries is provided at park entrance stations. See Park Directive #90-38 (Mgmt) (rev. 9/97), Cemetery Maintenance and Use Plan.

The Snead Barn in north district is maintained in its present state by the Park. Some of the more unusual structures, such as abandoned mines and wells, may pose safety hazards to visitors. These structures might require construction of physical barricades and other measures might be taken to make them safe if problems are identified and signing is not appropriate (see 'Project Planning Clearance" below).

Project Planning Clearance

Construction or maintenance activity which involves altering or routine maintenance of an historic structure or site or ground disturbance in an area that has not been archeologically surveyed requires that project planning clearance procedures be followed. Documentation including an Assessment of Effects form must be completed and approved before a project can be performed. This documentation, in draft form, is forwarded to the Park's Cultural Resource Specialist006 Coordinator.

Future Actions:

A. Existing historic structures, particularly those not routinely maintained, should be documented and photologged to aid in protection against damage and theft.

B. "Cultural resources" should be identified very specifically so that appropriate protection of backcountry historic structures and other "traces" can be determined and performed as appropriate.

C. All exisiting structures should be evaluated for National Register Eligibility by way of either a formal determination of eligibility or as part of the List of Classified Structures survey.

D. parkwide identify all areas of potential archeological sensitivity.

6.7 Administrative Roads

There are a number of secondary, unpaved roads and right of ways (ROW) that penetrate many backcountry areas. Roads and ROW's may be maintained through cooperative agreements with the state, or through commercial use permits with utility companies, or exclusively by the Park. Most administrative roads are old "fire roads" which are primarily used for park administrative

purposes. These road surfaces consist of either natural soils or crushed stone. Many of these roads predate park establishment and may be cultural resources. At least three administrative roads evaluations have been performed by Park staff in the last several years, the most recent in 1995. Information provided by the most recent survey is used to determine the level of maintenance of specific administrative roads and some roads may be abandoned, perhaps to be maintained within the trails system that most roads are part of. Administrative roads will be evaluated for historic significance before their trace is abandoned. Abandoned roads will be rehabbed to prevent erosion.

Former roads within designated wilderness areas have been closed and allowed to become foot and/or horse trails.

Administrative Roads Management by Opportunity Class

Primitive Wilderness
No roads for the purposes of vehicle travel will be allowed within this Opportunity Class.

Primitive Non-Wilderness
No roads for the purposes of vehicle travel will be allowed within this Opportunity Class.

Semi-primitive Wilderness and Non-wilderness, Threshold Wilderness & Non-wilderness
No roads for vehicle travel are allowed in wilderness areas. Only existing administrative roads are allowed in non-wilderness areas. No new roads will be constructed.

Appalachian Trail Wilderness and Non-wilderness
No administrative roads are allowed except where the AT crosses or parallels an existing road.

Future Actions

A. Complete cultural compliance process for roads recommended for abandonment.

B. Continue to evaluate the need for existing administrative roads as trends/needs change.

C. Maintain remaining administrative roads to provide for safe travel for the intended purpose (concessionaire/employee use vs. service road use), and to protect erosion and degradation of the resource.

D. As roads are closed to vehicular traffic and become foot or horse trails, rehabilitate them to conform with current trail maintenance standards.

6.8 Backcountry Signs

Park signing in the backcountry has evolved in response to a variety of informational needs and improving sign material technology. Backcountry signs used in the Park can be categorized as the following:

1. **Trailhead signing** includes informational signs such as the "trailhead exhibit" board or cement trail post with metal band, as well as regulatory signs such as metal photo backcountry regulation signs and fishing regulation signs mounted on metal posts, "dogs prohibited" signing using international symbols, and possibly other signs. These signs can be located at Skyline Drive or at boundary access trailheads.

2. **Trail junction signing** is primarily directional, such as the cement post with metal band or routed wooden sign, but might also include a metal photo sign of an area map in a high visitor use area.

3. **Regulatory/resource protection signs** are most frequently located at trailheads, but might also be placed anywhere in the backcountry to address a specific need or problem. Such signs include backcountry regulation signs, fishing regulation signs, stream closure signs, "No Camping" posts, "NO FIRES" or "NO HORSES" stenciled on a cement post marker, "No Hunting/No Trapping" signs and miscellaneous others. These signs should be inventoried and mapped and reviewed on an annual basis by the district backcountry staff and removed when no longer needed.

4. **Site-specific signs** are typically located on formal nature trails or at popular visitor attraction points. Examples of these signs would include interpretive or self-guiding nature trail signing and safety message signing at a waterfall viewpoint.

5. **Facility signs** relate to and identify a specific backcountry facility such as a hut, shelter. or cabin. These signs are frequently posted on the structure or on metal photo signs nearby.

6. **Temporary signs** are typically posted in the backcountry to advise or warn the public of a temporary emergency closure or a hazardous condition. Temporary signs are usually posted for special situations of less than a month in duration, but might be posted for as long as a year.

The objective of backcountry signing at SNP is to provide appropriate informational signing based on opportunity class parameters while keeping overall signing at a minimum.

See Table 6.2 "Summary of Backcountry Signing Guidelines Based on Opportunity Class."

Future Actions

A. Develop a backcountry sign manual to include description of types of backcountry signs, maintenance needs and responsibilities for each type of sign specific to SNP. Such a manual should incorporate guidelines from NPS-88, National Park Service Sign Guideline.

B. Develop a review process for evaluating the effectiveness and need for signs which are temporary in nature or the exception to the above guidelines.

C. Continue GPS/GIS parkwide backcountry signs survey to complete computerized inventory database.

D. Consider placement of signing at wilderness trailheads, such as that done in USFS wilderness areas, to indicate wilderness designation to the public and employees to enhance wilderness awareness and management. This would be accomplished in conjunction with improved SNP wilderness education of the public for awareness of wilderness values and visitor expectations of risk, challenge, and opportunities for solitude in SNP wilderness.

Table 6.2

Summary of Backcountry Signing Guidelines Based on Opportunity Class

OMPONENT	PRIMITIVE WILDERNESS	PRIMITIVE NON-WILDERNESS	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS	THRESHOLD WILDERNESS/ NON-WILDERNESS	APPALACHIAN TRAIL
Trailhead signing	Signing for trail system. Minimal signing.		Signing for trail system and area.	Signing for trail system and area. Special large text signs or repetitive signs may be used in problem areas.	Signing at trailheads w/ parking areas and at north & south entry points to park.
Trail junction signing	Cement post with directional band only. No additional signing. Stenciling on posts is discouraged.	Cement post with directional band. Additional signing such as stenciling on posts as needed.	Cement post with directional band. Additional signing such as stenciling on post permitted in non-wilderness only.	Cement post with directional band. Additional signing such as stenciling on post permitted in non-wilderness only. Special text signs may be used in problem areas.	Cement post with directional band. Use AT logo on post when possible.
Regulatory/ resource protection signs	Use primarily at trailhead. May be used elsewhere for resource protection or safety. Such signs are temporary.		Use primarily at trailhead. May be used elsewhere as needed.	Use primarily at trailhead. May be used elsewhere as needed. Special large text signs may be used in problem areas.	Use primarily at trailhead. May be used elsewhere as needed.
Site-specific sigos	Should not be used.	Signs only for visitor safety in non-wilderness.		Interpretive and safety signing permitted in non-wilderness.	
Facility signs	None in wilderness.	Use as needed at facilities.			
Temporary signs	Post signs at trailhead or boundary, except in emergency conditions on a case-by-case basis.		Post signs at trailhead or boundary when possible.	Post signs at trailhead or boundary when possible. Post elsewhere as needed.	

CHAPTER 7
RECREATIONAL USES OF THE BACKCOUNTRY

The recreational uses permitted or regulated in the Park are subject to changes as research and monitoring of resource conditions and visitor experience provides Park managers with new information. The Superintendent may adjust policies and' regulations to take appropriate actions to manage backcountry impacts (authority, Title 36 Code of Federal Regulations, section 1.5, Closures and Public Use Limits). These regulations are provided in a Superintendent's compendium/compilation document, an appendix to 36 CFR, and are published annually in the Federal Register and subject to public review and comment.

7.1 Rock Climbing

As early as the 1890s, the then-existing national parks recognized mountain climbing as a legitimate recreational activity. In the 1930s, the advent of more sophisticated techniques and tools lead to the introduction of technical rock climbing. Over the years this sport has increased in popularity and remains an appropriate backcountry-dependent recreational activity. According to NPS Management Policies (1988), the NPS will:

> ". . .encourage recreational activities that are consistent with applicable legislation, that promote visitor enjoyment of park resources through a direct association or relation to those resource, that are also consistent with the protection of the resources.. . Recreational activities that may be allowed include.. . mountain and rock climbing.. . " (Chapter 8:3)

In SNP, the earliest known technical climbing was done in the late 1930s and early 1940s by members of the PATC.

Technological developments in climbing equipment and styles of climbing have evolved over the years. During the past few years, "sport" climbing has rapidly developed, which focuses on increased technical skills and has resulted in a marked increase in climbing activity in the park. On most weekends, climbers can be found around areas like Little Stony Man Cliff and Old Rag Mountain. In 1991, a guide to climbing Old Rag Mountain was published in Rock & Ice magazine, which described approximately 100 routes and listed over 150 existing routes. Several bolted routes have been developed by visitors on Old Rag, some of which are visible and adjacent to the Ridge Trail.

The increase in climbing use has led to a number of resource impacts. Motorized drills have been used in the placement of steel bolts. Natural cracks are being cleaned of dirt and small plants, and lichens are removed from rock faces with wire brushes. There is more frequent use of chisels, hammers, and glue to alter the rock. The increasing use of chalk has also made highly visible "chalk trails" on rock faces. Side trails leading to the bases of climbs are probably the most noticeable impact. Most of these side trails are down very steep slopes which are quickly becoming well worn and eroded. Additionally, concern has been expressed by the

Virginia Division of Natural Heritage that a number of threatened plant species can be found along the Catoctin formation and that climbing could have an impact on these species (see chapter 2.4): particularly one-flowered rush (Juncus trifidus), fir clubmoss (Lvcouodium selago), three-toothed cinquefoil (Potentilla tridentata), and Rand's goldenrod (Solidago randii). Additionally, peregrine falcons, an endangered species, have shown an interest in mating and nesting in popular climbing areas such as Little Stony Man cliffs. Every year since 1992 the trail and cliff areas have been periodically closed to minimize disturbance of the birds.

In order to effectively manage climbing activity and associated impacts in SNP, a climbing management plan needs to be developed as a subplan to the BWMP. This plan will need to address the five criteria for allowing recreational activities as stated in Chapter 8:3 of NPS Management Policies and will need to address NPS wilderness management directives (NPS Director's Order #41). A complete inventory of existing and potential impairment to resources should be a part of this plan as well as an inventory of climbing areas and popular routes. Controversial issues such as use of fixed anchors (bolts) in wilderness as well as non-wilderness must be addressed. An LAC approach will be developed to manage climbing. It is strongly recommended that public involvement be obtained in the development of the plan, and that the climbing community as well as botanists be actively involved in policing this activity and minimizing resource impacts while assuring good opportunities for a quality rock climbing experience at SNP.

In the interim, existing regulations in 36 CFR Parts 1 and 2, as well as the Superintendent's **Compendium/Compilation of SNP Regulations,** provide the regulatory authority to manage climbing. Present regulations address destructive activities to natural resources including physical altering of rock faces, such as chiseling, breaking loose rocks, etc., which are prohibited. Existing regulations also address other visual adverse impacts such as use of chalk by climbers on rock faces. The removal of lichen or plants from rock faces is prohibited. The use of motorized equipment (power drills) in non-developed areas is prohibited. Such use is also prohibited in designated wilderness as described in the Wilderness Act.

Applicable Regulations:

36 CFR 1.5, Closures and Public Use Limits
36 CFR 2.1(a)(1)(iv) and (a)(1)(ii), Preservation of Natural, Cultural, and Archeological Resources
36 CFR 2.12(a)(1)(ii) and (a)(3), Audio Disturbances
36 CFR 1.4, Definitions ("developed area")

Future Actions

A. Develop a Climbing Plan as a subplan to the BWMP with public involvement from organizations such as PATC Mountaineering Section, The Access Fund, National Outdoor Leadership School and local climbing enthusiasts. SNP needs to better understand and address impacts to resources associated with climbing activity and assure that actions taken are consistent with NPS recreation and wilderness management directives and guidelines.

7.2 Bicycles

Touring the Park by bicycle is a popular means of transportation and this recreational activity is steadily increasing. Current regulations state that use of a bicycle (including mountain bikes) is limited to 'Skyline Drive and developed areas. Bicycles are prohibited in wilderness and on all trails and administrative roads in the backcountry.

Mountain bikes have become a popular form of recreation for the outdoor adventurer and the demand for use within the NPS is on the rise. The potential of bicycle use within SNP has been examined. In 1992 an evaluation was conducted by the Chief Ranger to examine potential use areas and associated impacts. Based on the information gathered, the decision was made to not change the existing regulation prohibiting bike use in the park's backcountry.

Applicable Regulations:

36 CFR 1.5, Closures and Public Use Limits
36 CFR 4.30, Bicycles
36 CFR 1.4, Definitions ("bicycle")

7.3 Horse and Pack Animal Use

For purposes of clarification, horses, mules, burros and llamas are designated as pack animals according to 36 CFR 2.16, Definitions.

Although horse and pack animal use is common in the Park and may be increasing, backcountry use requires restricting pack animal use to separate conflicting recreational use and concentrate this activity to areas which can sustain horse and pack animal impacts. It is widely recognized and documented that horse use on travel routes shared with hikers and backpackers can create conflicts. Trail tread conditions are heavily impacted by horse use and horses leave waste material which is increasingly problematic as volume of horse use increases. However, horse use is a traditional use at SNP and considered to be a primitive form of backcountry travel. A system of horse trails has been established to reduce conflict among trail users and to confine pack animals to specific trail areas. The trail system is maintained to park trail standards to sustain horse use and to mitigate impacts. Riding and pack animals are restricted to use trails or routes marked with yellow blazes. Off-trail or cross-country use, except to travel to a pre-determined campsite area, is not permitted. Travel on the Skyline Drive or the road shoulder is permitted only for accessing the yellow-blazed trail system.

Riders should bring their horses to a slow walk when passing in the immediate vicinity of other people. Riding or hitching pack animals in developed areas, within the immediate vicinity of trail shelters or other public gathering areas, is 'prohibited. Pack animal use is permitted only where trails and facilities are designated for such activity. Pack animals must be tethered to hitching posts where available or constrained in such a manner that they will not damage vegetation. Grazing is not permitted. A backcountry camping permit is required for overnight use of pack animals and all other backcountry regulations must be followed. Although overnight

camping activity is permitted, resulting horse use can be highly impacting to park natural resources and is discouraged even as "minimum impact" techniques are practiced. Nevertheless, horse users are encouraged to practice Leave No Trace backcountry ethics.

Applicable Regulations:

36 CFR 1.5, Closures and Public Use Limits
36 CFR 2.16, Horses and Pack Animals
36 CFR 1.4, Definitions ("pack animal")

Future Act ions

A. Develop site bulletin to provide information on pack animal use in the Park and to educate horse users in Leave No Trace backcountry use ethics.

B. Research, select, and implement appropriate backcountry camping strategy for pack animal users (ie. limited designated sites)

C. Encourage local horse clubs/individual rider user groups to take active responsibility in trails maintenance, particularly treadwork, if the horse trail system is to be managed at an acceptable condition.

Table 7.1
Listing of trails or portions of trails open to pack animal use:

NORTH DISTRICT

Beecher Ridge Trail
Bluff Trail
Browntown Trail
Compton Gap Trail
Harris Hollow Trail
Heiskell Hollow Trail
Hickerson Hollow Trail
Hull School Trail
Jordon River Trail
Keyser Run Road
Knob Mountain Trail
Lands Run Road
Mathews Arm Trail
Mt. Marshall Trail
Neighbor Mountain Trail
Piney Branch Trail
Rocky Branch Trail
Thornton River Trail

CENTRAL DISTRICT

Berry Hollow Fire Road
Conway River Fire Road
Dry Run Fire Road
Fork Mt. Fire Road
Fork Mt. Trail
Graves Mill Road
Hazel Mt. Trail
Haze1 River Trail
Mill Prong Trail
Old Rag Fire Road
Pine Hill Gap Trail
Pocosin Fire Road
Pocosin Horse Trail
Rapidan Fire Road
Red Gate Fire Road
Rose River Fire Road
Skyland Fire Road
Skyland/Big Meadow Trail
Slaughter Trail
South River Fire Road
Stony Man Mt. Horse Trail
Stony Mt. Trail
Tanners Ridge Fire Road
Upper Dark Hollow Trail
Weakley Hollow Fire Road
West Naked Creek Trail
White Rocks Trail

SOUTH DISTRICT

Big Run Loop Trail (S. side)
Big Run Portal Trail
Browns Gap Fire Road
Gasline Road
Madison Run Fire Road
Miller Run Fire Road
Paine Run Trail
Patterson Ridge Trail
Simmons Gap Fire Road
Smith Roach Gap Fire Road
South Fork Moorman Fire Road
Turk Branch Trail
Turk Gap Trail

7.4 Pets

Nearly all units of the national park system and most state parks nationwide prohibit dogs and other pets. Unlike many natural and recreation areas, SNP does permit pets, but with some restrictions. Although SNP has traditionally permitted dogs and other pets in the backcountry, significant problems are created as wildlife is harrassed and frightened by unrestrained pets, other visitors are frightened or disturbed by unrestrained or poorly supervised pets.

Pets are prohibited on designated nature trails (see below) and on some very heavily-used day hiking trails in the backcountry. (Guide dogs and work dogs are NOT prohibited on the trails.) The reasons for the closure on these trails are to:

1. Maintain public health and safety;
2. Avoid conflict among visitor use activities;
3. Protect natural resources; and
4. Protect pets from risk of injury (see 2-b below).

The following trails are closed to pets:

1. Nature trails
   a. Fox Hollow Trail
   b. Traces Trail
   c. Stony Man Trail*
   d. Story of the Forest (Swamp) Trail
   e. Deadening Trail

* Except the section which is also part of the AT from the Stony Man Nature Trail parking lot to where the AT splits again. The “no pets” sign is still posted at the trailhead to discourage pets. However, since the remainder of the AT is open to pets, AT through-hikers are permitted to take a pet on this section of the trail.

2. Other trails closed to pets
   a. Dark Hollow Falls Trail
   b. Old Rag Mtn.: Ridge Trail and Saddle Trail above Old Rag Shelter
   c. Bearfence Trail
   d. Limberlost trail

Pets are permitted on other trails and other areas in the backcountry in compliance with the regulations set forth in 36 CFR 2.15, Pets, which are as follows:

a. Pets must be restrained on a leash, not to exceed six feet, or otherwise physically confined.

b. Pets must not be left unattended or tied to an object except in designated areas (there are no areas currently designated at SNP).

c. Pets are not allowed to make unreasonable noise that impacts park users or frightens wildlife.

Impound Policy:

The CFR regulations that apply to free-roaming dogs are listed under 36 CFR 2.15, Pets, and are as follows:

A. Pets or feral animals that are running-at-large and observed by an authorized person in the act of killing, injuring, or molesting humans, livestock; or wildlife may be destroyed if necessary for public safety or protection of wildlife or other park resources.

B. Pets running-at-large may be impounded and the owner may be charged reasonable fees for kennel and/or boarding costs and collateral (fines) for violations as appropriate.

Numerous incidents have been recorded in which deer, bear, and other wildlife have been chased, injured, or killed by dogs roaming freely within the park. Cats have also chased, injured, or killed birds and small mammals.

Dogs owned by park neighbors frequently are not under control and roam into the backcountry on a regular basis. In addition, State law permits the use of dogs for hunting on lands outside the park. Dogs used in the legal pursuit of bear, foxes, raccoons, or other game outside of the park regularly follow wildlife into the park.

All Protection Rangers should be familiar with the impound and law enforcement procedures for handling free-roaming dogs which are described in NPS-9, Law Enforcement Guideline, SNP Addendum 1.

Applicable Regulations:

36 CFR 1.5, Closures and Public Use Limits
36 CFR 2.15, Pets
36 CFR 1.4, Definitions ("pet")
NPS 9, SNP Addendum 1; Law Enforcement Guideline, SNP impound policy

Future Actions

A. Consider additional restrictions for "pet-free" areas to reduce visitor and wildlife/dog conflicts and impacts.

7.5 Fishing

The mountain streams of SNP are inhabited by a variety of species of fishes and these pristine waters provide some of the best protected strongholds for native eastern brook trout. The Park's Fisheries Management Plan (FMP) has two objectives: (1) to preserve and perpetuate native brook trout as a key component of the Park's aquatic ecosystems; and (2) to allow for recreational fishing on those Park streams that consistently produce adequate numbers of gamefish for maintaining population stability. While the FMP has not yet been revised, SNP Management now recognizes a third objective: to preserve and perpetuate the native aquatic diversity of these streams. Regulations and park policies are designed to carry out these objectives.

In accordance with 36 CFR section 2.3, Fishing, a Virginia State fishing license is required for persons 16 years old and over to fish within SNP. The following fishing regulations are applicable:

Table 7.2 SNP Fishing Regulations and Guidelines

(1) Waters All streams within Shenandoah National Park, including all tributaries, are open for catch and release recreational fishing unless (1) designated as closed or (2) designated as open for harvest. Streams designated as open for harvest are also considered to be open for catch and release fishing. Those streams that are closed or designated for harvest are listed in the compendium and the Recreational Fishing brochure.

(2) Season Streams and their tributaries designated as *Open for Harvest or Catch and Release* are open all year.

(3) License All residents 16 years and older fishing within the Park must have a Virginia State fishing license in his/her possession. A 5-day nonresident license ($6.00) may be purchased at Panorama Restaurant, Big Meadows and Loft Mountain Waysides, or from local sporting goods stores. Non-residents 12 years and older must have a Virginia license.

(4) Size Limit No trout under nine (9) inches in length may be kept. Undersized fish must be immediately and carefully returned to the water. Size limits on other species of game fishes are those established by applicable State law.

(5) Creel Limits No person may retain more than six (6) trout per day nor have more than six (6) trout in possession. Creel limits on other species of game fishes are those established by applicable State law.

(6) Only a single hook (barbed or barbless) or artificial lure may be used.

(7) Commercial Fish Guides Anyone who serves as a fishing guide or instructor for compensation must obtain an Incidental Business Permit from the Park Superintendent prior to entering the Park.

Park Streams Designated As Open For Harvest Fishing

The following streams, including their tributaries within the Park are open for harvest fishing in accordance with regulations published in the Code of Federal Regulations (CFR) and the Virginia State Fishing Regulations.

Streams	Countv
Piney River	Rappahannock
Thornton River, North Fork	Rappahannock
Thornton River, South Fork	Rappahannock
Hughes River	Madison
Brokenback Run	Madison
Whiteoak Canyon Run	Madison
Cedar Run	Madison
Rose River	Madison
Conway River	Madison/Greene South
River	Greene
Ivy Creek	Greene
Doyles River	Albemarle
Jeremy's Run	Page
Pass Run	Page
Hawksbill Creek, East	Page
Hawksbill Creek, Little	Page
Naked Creek, East Branch	Page
Naked Creek, West Branch	Page
Big Run	Rockingham
Madison Run	Rockingham
Paine Run	Augusta
Meadow Run	Augusta

Streams Designated As Closed

Fishing is prohibited at all times on the following streams, including their tributaries. No gamefish species, including trout, may be in possession at any time. These streams have been designated as long term inventory and monitoring scientific study areas and must remain undisturbed.

Stream	County
Ragged Run	Madison
Dry Run, North Fork	Page
One Mile Run	Rockingham

Recreational Fishing Guidelines

Anglers who wish to continue recreational fishing at its finest are encouraged to consider the following ethical fishing techniques for hooked fish:

(1) All fish that are to be released must be carefully handled and immediately returned to the stream. Try to release fish without removing from the water.

(2) Maintain control of fish with wet hands and only a slightly firm grip.

(3) Most importantly, avoid contact or damage to sensitive gills.

(4) Never leave litter, hooks or spent fishing line in the Park - pack it out.

Applicable Regulations:

36 CFR 1.4, Definitions ("fishing")
36 CFR 1.5, Closures and Public Use Limits
36 CFR 2.3, Fishing

Future Actions

A. Periodic regulatory review of the fishing regulations will occur as part of the Park Compendium revision process.

B. Additional public use limits and closures may be implemented due to severe weather events.

7.6 Hiking

There are approximately 500 miles of trails in the Park, including a 95-mile section of the AT. All trails are marked with a colored blazing system and directional trail posts. White blazes represent the AT, blue blazes indicate trails designated for hiking only, and yellow blazes show horse trails and administrative roads. Blazes are painted on trees and are maintained by Park personnel and volunteers.

At trailheads and junctions are concrete posts with metal bands indicating mileages and trail directions. Hikers should not depend solely on these posts and blazes, but should obtain more information from a Park contact station or map prior to beginning their hike. "Short hikes" and other specific trail site bulletins are available at the visitor centers and information stations. PATC topographical trail maps are also sold at visitor centers and information stations throughout the Park. There are numerous other publications available on hiking in and around SNP. Hikers are encouraged to stay on marked trails unless they are highly experienced and proficient with topographical map and compass use; off-trail hiking is very strenuous due to rocky and steep topography, seasonally dense vegetation, and numerous downed trees from severe storms.

Trails are maintained at various standards depending on the opportunity class within which they are managed. Hikers need to carefully plan and prepare to achieve the backcountry experience they are looking for, as trails vary widely in challenge and degrees of solitude experience. Weather changes are rapid in the mountains and hikers are often unprepared for the immediate climate differences between nearby metropolitan areas and the Park. It is important that Park employees providing hiking information are also aware of directing hikers of varying experience levels to appropriate trail areas and provide the appropriate safety information.

The popularity of day-hiking in the Park limits the possibilities of solitude some visitors are seeking. To find a sense of isolation where one can enjoy what nature has to offer without encountering other people, the experienced hiker might explore trails located within the Primitive Wilderness and Primitive Non-wilderness opportunity classes, depending on the seasonal backcountry visitor use levels.

Hiking access is available from various points along Skyline Drive and from State and private lands adjacent to Park boundary. Park boundary accesses are often difficult for the inexperienced visitor to locate, generally provide poor parking opportunities, and often create conflict with local landowners through whose land many, sometimes unsubstantiated, public accesses cross. Overuse and subsequent local landowner difficulties have resulted in closure and restrictions at many boundary trailheads. Park boundary trail access should not be encouraged due to these concerns. Chapter 13 provides current boundary access information.

7.7 Overnight Camping

A backcountry camping permit is required for all overnight campers excluding cabin users. Permits provide Park staff with the opportunity to educate visitors on minimum impact backcountry use techniques and regulations, provide safety and weather information, assist visitors in appropriate trip planning, and more. Park managers can monitor density and location of backcountry overnight use and are provided with other baseline information on backcountry visitors. Permits may be obtained at various locations in and around the Park. Detailed backcountry camping permit and additional backcountry camping information is provided in chapter 12.

Applicable Regulations:

36 CFR 2.10, Camping and Food Storage
*36 CFR 7.15 Backcountry Camping

Future Actions

"A. Special Regulations will be removed to the Park Compendium upon approval of proposed regulations; the compendium regulatory review process will be implemented and public use limits/closures will be applied.

7.8 Cross-country Skiing

Winter conditions at SNP offers a variety of cross-country ski opportunities when suitable snow conditions exist. Snowfall may vary greatly from one winter to the next and the potential for skiing opportunities from one year to the next are fairly unpredictable. No cross-country ski trails are designated or are maintained specifically to accomodate skiing. Skiing is permitted on all park trails and administrative roads and the Skyline Drive (when closed to public vehicle use). Snow conditions good for skiing in the Park generally coincide with Skyline Drive road closure due to poor Drive road surface conditions and travel access to trailheads is therefore often very limited. Generally, snow-covered administrative roads provide the best skiing opportunities. A site bulletin for each the North and Central Districts are available to suggest possible ski routes. Bulletins may be obtained from information stations.

In the North District, the local Shenandoah Nordic Ski Patrol provides area ski patrol (and foot patrol depending on snow conditions or the lack thereof) routinely on winter weekends, also providing backcountry camping permits and winter weather preparedness information to Park visitors in the Thornton Gap/Panorama area.

Applicable Regulations:

36 CFR 2.19, Winter Activities

7.9 Hang Gliding

A special use permit is required for hang gliding and is issued by completing a Form SNP-31 application and paying the appropriate fee at park headquarters during business hours. The permit is valid for one calendar year and must be in physical possession of the permittee upon launch. The user must be rated at Hang 3 (cliff launch, high altitude) or better and must have the landing site owner's permission prior to landing on private property. Approved launch sites are Dickey Hill, Hogback Mountain, and Millers Head (designated on site maps available in the compendium of park regulations). These backcountry (non-wilderness) sites are undeveloped, unsigned, and not maintained by the park. Hang gliders may not be launched elsewhere in the park and may not be landed anywhere in the park.

Local hang glider clubs include the Central Virginia Hang Glider Association and the Capitol Hang Glider Association. These clubs self-insure their members and have arranged private landowner permission for use of landing sites adjacent to the park. The Central Virginia Hang Glider Association performs launch site maintenance to meet safety needs.

Applicable Regulations:

36 CFR 7.15, SNP Special Regulation (powerless flight)
36 CFR 1.5, Closures and Public Use Limits
Virginia State Law, Title 29.1-509; Hazardous Sports Law (references landowner

liability in the use of private land as landing sites by hang gliders)

Future Actions

A. Launch sites should be monitored for resource impacts and site maintenance and rehabilitation needs. The launch site at Millers Head should be closely monitored for trampling impacts to endangered area vegetation as described in the National Heritage Report. Access trails should be maintained. Local hang glider clubs might participate in a site maintenance program addressed by a MOU.

CHAPTER 8
TRAIL MANAGEMENT

8.1 Trail System

Nearly 500 miles of trails are maintained within SNP. About 200 miles of these trails are located within designated wilderness. The park's trails vary widely in length, difficulty, access, condition standards, and types of use permitted.

The Civilian Conservation Corps and the PATC built many of the park trails between 1933 and 1942. Today, the majority of the trails are well-graded and lead to significant features, connect developed areas, or follow interesting routes. Many trails are linked together and offer a variety of circuit hikes. However, a number of the horse trails and the lesser-used foot trails follow old road beds; some of which are steep, eroded, and poorly designed. Older trails which terminated at the Park boundary and had limited or no public access were closed. Additionally, remnants of old fire foot trails which are no longer being maintained can be found throughout the Park.

Standards of maintenance on park trails vary depending on a number of factors, including the opportunity class in which they are managed, the type of trail (ie. nature trail, horse trail), whether the trail is within legislatively designated wilderness (restricting the use of power tools and affecting trail condition standards), or has other special legislation attached to it (such as the AT, a National Scenic Trail), and the level of visitor use.

Trail access and parking is primarily found along Skyline Drive. Parking areas range from large paved lots to small unmarked spaces for a few vehicles along the road shoulder. During peak times, it is not uncommon for parking lots to overflow with vehicles parked on the grass along the road shoulders. Trailhead parking along the boundary is generally very limited, particularly for horse trailers and large groups.

Types of Trails

Appalachian Trail (White-blazed)
The longest, continuous trail in the park is a portion of the Appalachian National Scenic Trail, or AT, which generally follows the ridge line for 95 miles from Compton Gap to Jarman Gap and is part of the 2,000+ mile route from Maine to Georgia (see chapter 3.5). This segment of the trail was first built between 1928 and 1932 by the PATC prior to the establishment of the Park and construction of Skyline Drive. Much of the trail was displaced and required relocation during the construction of the Skyline Drive, and currently the trail crosses the Skyline Drive at 30 places. In 1968, the entire AT was legislatively designated as a National Scenic Trail. The AT is blazed white and maintained primarily by PATC with Park staff assistance as necessary.

Foot Trails (Blue-blazed)
Foot trails are blazed blue and lead to many ridges and hollows throughout the Park. Many blue-blazed trails connect with the AT or horse trails (yellow-blazed). About 200 miles of Park

trails are included in the blue blazed system. Most of these foot trails, considered to be side trails of the AT, are generally maintained by PATC under a MOU. The Park usually assists PATC with major trail rehabilitation projects or large blowdown removals.

Horse Trails (Yellow-blazed)
Almost 200 miles of designated horse trails and administrative roads are available for horse and pack animal use. Horse trails are blazed yellow, and these are the only trails available for horse and pack animal use.

Nature Trails (not blazed)
Nature trails comprise about 8 miles of the total trail miles in the Park. Most of these trails are self-guided where the user can learn about the ecosystem with either a brochure or by reading information posted on signs along the trail. They are generally less than two miles in length and some provide a circuit. Nature trails are found near developed areas, and backcountry camping is very limited if not specifically prohibited. Pets are prohibited on all Park nature trails with the exception of the Stony Man Nature Trail.

Liiberlost Trail (not blazed)
Limberlost Trail in the Central District is the only handicap accessible trail in SNP. This loop trail is ideal for people with mobility limitations, novice hikers and families with baby strollers. The trail is 1.3 miles long and features a five foot wide hard-packed trail surface comprised of crushed greenstone. The trail gradient is less than 8% throughout, and there are reststops and wooden benches every 400 feet. The trail also features a 65' bridge which spans the Whiteoak Canyon Run and a 140' boardwalk which traverses an ecologically sensitive swampy area. Pets are prohibited on this trail with the exception of seeing-eye dogs. The Limber-lost Area is best known for its old-growth hemlock forest.

8.2 Role of the Potomac Appalachian Trail Club

The Park and the PATC have been jointly involved in the stewardship of trails since the 1930's. The PATC is a member of the ATC (see chapter 3.5) with responsibilities for maintaining the AT and many other foot trails in the Park and in Virginia, Maryland, and Pennsylvania.. The partnership between the Park and the PATC is solidified every five years in a MOU which includes the following objectives:

1. To coordinate maintenance on trails as listed in the Trail System inventory, Appendices.

2. To establish procedures for reviewing changes in the Park's trails system.

3. To correct hazardous trail conditions at the earliest opportunity.

The PATC is responsible for performing all routine and recurring trail maintenance including

blazing, trimming and removal of vegetation, clearing windfalls, and construction and maintenance of water control structures on those trails of their responsibility. The PATC recruits and obtains volunteers who adopt and oversee maintenance of trail sections. Additionally, the PATC annually organizes the Shenandoah Crew which operates during a four- to six-week period in the Park, providing one to two weeks of trails construction and maintenance in each district. The PATC also coordinates trail maintenance workshops for overseers and prospective overseers in cooperation with the Park; The PATC manages three maintenance structures (South River, Ivy Creek and Indian Run) for equipment and tool storage and as overnight facilities for PATC-sponsored work trips (see chapter 6.3).

In cooperation with other AT partners (ATC and ATPO) the PATC supports SNP with Trail Patrol and Ridgerunner programs to monitor trail conditions and to provide information and support to visitors and Park managers. As of 1998, volunteer natural heritage site monitors are working with SNP resource specialists to monitor rare plant species at selected sites along the AT to document the impacts of hiking trails on rare plant populations.

8.3 Trail Maintenance Standards

Much more than just a convenient travel zone for visitors to provide recreation and access to destination backcountry sites, trails function as a management tool to confine human use and associated resource impacts, serve to regulate access to or away from specified backcountry areas, and improve visitor safety in difficult or unfamiliar natural conditions. Although standards for trail conditions may vary, well maintained trails are important to these objectives so that resource conditions and a quality visitor experience are preserved.

Blazing

Objective: All maintained trails except nature trails and Limberlost Trail in the Park will be blazed to some extent depending on the type of opportunity class in which the trail falls. The objective in blazing is to mark the trail often enough to guide the hiker and keep the trail distinguishable, but not so often that blazes become a visual intrusion. In the Primitive Wilderness and Primitive Non-wilderness classes, blazing is not necessarily intended for the convenience of the hiker or horse user but to keep the trail distinguishable, open, and maintained for hikers of various ages and experience levels typically travelling in SNP backcountry.

General Standards for blazing:

- Use 2 " X 6” vertical rectangles.
- Place at eye-level on live trees. Avoid painting rocks.
- Use double blazes (one above the other) for sharp turns and trail junctions
- Blazes should be visible across an intersection with another trail, a stream, or road.
- Where two blazes of different colors are used on the same trail, the two blazes are to be placed side-by-side.
- Avoid overblazing.
- Cairns, metal diamond markers, etc. should not be used to mark trails.

Standards for Primitive Wilderness, Primitive Non-wilderness, and Semi-primitive Wilderness and Non-wilderness Opportunity Classes (blue- and yellow-blazed trails)

- Use blue paint for maintained foot trails; yellow paint for horse trails
- Reblaze only as necessary (generally no more than every three years) to keep blazes visible. Carefully remove excess blazing.
- No more than one blaze should be visible at any time, unless special conditions warrant (i.e. trail difficult to follow due to overgrown vegetation).
- When standing at one blaze, pick a prominent spot ahead, walk past it a short distance and blaze the next prominent spot. Blazes should be 300-500 feet apart if possible. Avoid abrupt changes in frequency.

Standards for Threshold Wilderness and Non-wilderness and for Appalachian Trail Wilderness and Non-wilderness Opportunity Classes (Blue-blazed, yellow-blazed, and white-blazed trails)

- Use blue paint for maintained foot trails; yellow paint for horse trails; white blazes for the AT. Nature trails are not to be blazed.
- Reblaze every few years to keep blazes visible and to replace missing or enlarged blazes. Carefully remove excess blazing.
- No more than one blaze should be visible at any time, unless special conditions warrant.
- When standing at one blaze, pick a prominent spot ahead, walk to it, pick the next good spot and place the blaze there. Blazes should be 300-500 feet apart. Avoid abrupt changes in frequency.

Techniques for Blazing:

- Pick prominent, large, living trees; dark-colored bark provides a better contrast for the blaze.
- Choose trees which are prominent when foliage is out (clip away low bushes or protruding branches to clear the blaze area).
- Scrape a 3” X 7” rectangle on thick barked trees.
- Rub moss and lichen off a 3 " X 7” rectangle on thin barked trees.
- Paint neatly; avoid using too much paint (it will run down the tree).
- Blaze in the direction you are hiking; walk back to blaze the other direction,
- Avoid blazing rocks.
- To avoid overblazing, err on the side of too few blazes; more can be placed later if needed.

Equipment for Blazing:

- 1 gallon bucket with bail,
- 1" brush,
- blaze paint,
- paint scraper,
- rags, paper towels, aluminum foil to wrap brush in until cleaning, etc., and
- brush cleaner and hand cleaner for afterwards.

Vegetation Maintenance

Objective: To keep trails from being overgrown with vegetation by removing branches, weeds, and brambles that interfere with passage along the trail.

General Standards:

- Width will vary with type of trail and opportunity class.
- Steep slopes with thin and unstable soils should have narrower trail tread as roots help to stabilize the slope.
- Height should be sufficient to allow a tall backpacker or a rider on a horse on yellow-blazed trails to pass,
- Cut branches flush with the main stem; shrubs and trees should be cut flush with the ground to avoid leaving hazardous stubs (see Techniques below).
- Remove debris from trail; scatter if there are large amounts.
- Do not grub or remove trailside plants; the remaining plants and root systems help stabilize the soil.

Standards for Primitive Wilderness and Primitive Non-Wilderness Opportunity Classes (Blue-blazed and yellow-blazed trails)

The purpose for trail vegetation maintenance in these areas is to keep the trail open for light travel. Visitor convenience is not a primary objective.

- Trail vegetation should be maintained to allow hikers and horse riders to pass (not necessarily in shorts) single file without contacting shrubs, weeds, briars, or branches (blue-blazed trails about l-2 feet on each side of trail; yellow-blazed trails, 2-3 feet on each side of trail)
- Trail vegetation should be trimmed as necessary in late spring; additional work during summer months may be necessary to maintain the required width and height.

Standards for Semi-primitive Wilderness and Non-Wilderness Opportunity Class (Blue-blazed and yellow-blazed trails)

The purpose for vegetation maintenance in these areas is to keep the trail open for moderate travel. Visitor convenience and safety are also considerations.

- Trail vegetation should be maintained to allow hikers and horse riders to pass for the most part easily without contacting shrubs, weeds, briars, or branches (blue-blazed trails about 2-3 feet on each side of trail; yellow-blazed trails, 3-4 feet on each side of trail).
- Entire trail should be maintained in spring and at least once during late spring; additional vegetation maintenance may be necessary to maintain the required width and height.
- Areas in front of blazes should be kept open to allow maximum visibility of blazes.

Standards for Threshold Wilderness and Non-wilderness and for Appalachian Trail Wilderness and Non-wilderness Opportunity Classes (Blue-blazed, yellow-blazed, and nature trails)

The purpose for vegetation maintenace in these areas is to keep the trail open and maintained for heavy travel. Visitor convenience and safety are also primary considerations.

- Trails should be maintained to allow hiker and horse riders to pass easily without contacting shrubs, weeds, briars, or branches (blue-blazed, AT, nature trails about 3 feet from each side of trail; yellow-blazed trails, 3-4 feet on each side of the trail.
- For blue-blazed and nature trails, entire trail should be maintained in the spring and at least once more during the summer; wet areas, old field, and other sections prone to weed and briar growth should be cleared more often if necessary. Yellow-blazed trails should be maintained at least once during late spring and more often if needed.
- Areas in front of blazes should be kept open to allow maximum visibility of blazes.

Techniques for Vegetation Maintenance:

The amount of vegetation maintenance is dependent upon the opportunity class. For primitive areas, a minimal amount of maintenance should be undertaken.

- Low shrubs and young trees are cut flush with the ground to prevent tripping and to reduce sprouting from the stump and roots.
- Trim branches 1" from the main trunk of the stems to prevent snagging passing hikers and to prevent tree injury.
- Branches growing towards the trail should be cut back to the next limb growing away from the trail (to encourage growth away from the trail).
- It is better to remove all lateral branches than to remove the tree top since removal of the terminal bud will encourage lateral growth across the trail.
- Grubbing with a cutter mattock or pulaski may be necessary to clear the tread of long neglected trails; do not remove any more vegetation than is necessary to define the tread.

Equipment:

- Long handled clippers (loppers),
- Weeders (swing blades),
- Small saws,
- Pulaskis or cutter (#3) mattocks (for grubbing out vegetation in the trail tread),
- Power weeders (except in designated wilderness areas),
- Proper safety equipment (goggles, ear protection, gloves).

Clearing Fallen Trees and Windfalls

Objectives: Perform safe removal of dangerous trees and allow passage along the trail while retaining features which contribute to trail maintenance and to user enjoyment. Timely removal of trail obstructions minimizes visitor-created detour trails which degrade the resource and complicate effective trail maintenance.

General Standards:

- Safety is the primary consideration. Do not attempt to remove large or "hung-up" trees alone. Do not exceed the capability of equipment or personal skills.
- Clearing should be done at least once each year in early spring to remove winter storm damage; additional work may be necessary during the year due to storms.
- Clear to the same width of cleared vegetation.
- Appropriate safety equipment **must** be worn (goggles, ear protection, chaps, helmet, gloves). Personnel should also protect themselves from tick infestation (long sleeves, tick repellent). Personnel should clear trees in pairs and must be checked out by a supervisor before performing chain saw work. Primitive tool crosscut saw and grip hoist work can be even more dangerous than chainsaw work in some situations; safety equipment including gloves and a helmet **must** be worn.

Standards for Primitive Wilderness and Primitive Non-wilderness Opportunity Classes (Blue-blazed, yellow-blazed trails)

- Remove only those trees, windfalls, or other obstructions which do not lie flat on the ground or which cannot easily be stepped over or walked under by a person carrying a backpack or rider on a horse.
- The cleared width should allow persons to walk or ride single file.
- In wilderness, if the width of deadfalls are so large that a tremendous amount of effort and manpower will be required to remove the deadfall, or if worker safety is seriously compromised with primitive tool work, consideration should be given to relocating the trail around the obstacle, but only as a last resort. Steepness of slope, length of detour, difficulty in getting around the obstacles are factors which should be considered. Chainsaw use under these circumstances requires parkwide project clearance and compelling evidence for use of mechanized equipment.

Standards for Semi-Primitive Wilderness and Non-wilderness, Threshold Wilderness and Non-wilderness, and Appalachian Trail Wilderness and Non-wilderness Opportunity Classes (Blue-blazed, yellow-blazed trails, nature trails)

- Remove all fallen trees, windfalls, and other obstructions from trail, except those which prevent erosion (by acting as waterbars), prevent access by vehicles at trailheads, and which can be easily stepped over without breaking stride. Trees not removed should lie flat on the ground and should be less than 12" in diameter.
- All obstructions should be removed as soon as possible (particularly from spring through autumn) to prevent danger to users and discourage hikers from walking off the trail).

Techniques for Clearing Fallen Trees:

- Remove material far enough from trail side to prevent snagging of hikers.
- Watch the tension on fallen trees; saw so the natural tension opens the cut rather than pinches the saw.
- Use pry poles or levers to relieve tension and open the sawcut.
- Drag windfalls away from the immediate sight of the trail. Try to reduce the visual impact of cut trees by turning cut ends of logs away from view of the trail. Flush cut stumps to the ground to reduce visual impact and to encourage rapid decay of the stump.

Equipment:

- Bow saws,
- Cross-cut saws,
- Axes,
- Clippers,
- Chain saws (for non-employees, use only as authorized by MOU with the Park or as advised by a district supervisor for Volunteers-In-Park personnel; chainsaws and other motorized equipment are prohibited in wilderness except as approved by Superintendent).
- Grip hoist (especially for use as primitive tool to drag trees and large rocks off trails in wilderness).

Trail Tread (Erosion Control and Prevention)

Objective: Maintain or restore a trail tread (the footpath surface) which is safe for users and prevents the deterioration of the trail resources.

All maintenance activity expected to occur outside of the original footpath and associated water control features must have parkwide project clearance completed and approved. Use of natural materials is required in trail construction work; use of dimension lumber is discouraged and use of pressure-treated or creosoted lumber is not permitted.

General Standards:

- Install grade dips or install waterbars on all slopes at a frequency sufficient to eliminate water from the trail before erosion occurs.
- Install checkdams in badly eroded trails to retain sediment and restore tread. Checkdams are less effective than waterbars.
- Keep culverts clear of silt and organic debris.
- Clear debris from streams downstream from trail crossing (to prevent damming and flooding on the trail).
- Dig channels for small streams and channels for streams to cross the trail without travelling along the trail.
- Remove accumulated silt and organic debris from waterbars in spring or when needed.
- Remove loose stone and other debris which could cause hikers to trip or twist an ankle.
- Discourage shortcutting of switchbacks by blocking shortcuts with branches and other debris. Heavy materials such as stumps or rocks might be used so that people do not remove them.

Standards for Primitive Wilderness and Primitive Non-wilderness Opportunity Classes (Blue-blazed and yellow-blazed trails)

- Annual maintenance may be sufficient; sections with unusual problems may require additional maintenance. The prevention of resource damage (erosion) should dictate the frequency of maintenance, with minimal amount of work.

Standards for Semi-Primitive Wilderness and Non-wilderness, Threshold Wilderness and Non-wilderness, and Appalachian Trail Wilderness and Non-wilderness Opportunity Classes (Blue-blazed, yellow-blazed, nature trails)

- All waterbars should be cleaned and restored at least once each year due to erosion damage and wear from heavy foot or horse traffic.

Techniques:

Waterbar construction:

- Choose locations along the trail which naturally tend to allow water to run off the trail such as turns in the trail. Restore old waterbars if possible. Place waterbars near the top of a slope to prevent water from gaining momentum.
- Construct a waterbar by digging a shallow trench at a 30-40 degree angle from the perpendicular of the trail and placing in it 10-12" rocks or a log. Strip bark from logs to slow rotting and use hardwoods like black locust. **(Do not cut standing trees for this material!)** Rocks or logs should protrude about 6" above the level of the tread on the downhill side (use a 10" to 12" diameter log). Cover rocks with small rocks and soil to create a mound. Secure logs with wooden stakes (natural stakes are preferable) or rocks on the downhill side. Cover stakes or rocks with soil and compact well. Another alternative is to construct a waterbar with well packed soil alone.
- Slope the trail above the bar gently toward the bar to create a broad trench. The lowest point of the trench should be at the bar and should be below the level of the trail tread on the downhill side. Do not expose so much of the downhill side of the waterbar that it becomes undermined by erosion.
- The waterbar should extend past the tread on both sides of the trail.
- The trench should extend beyond the waterbar and should be fanned out to assure that water is adequately dispersed and does not return to the trail.
- Drainage ditches alongside the trail may be used to move water to a suitable location for drainage away from the trail.
- Compact waterbars well so that use will not damage them. Do not leave protruding rocks or stakes which could trip a hiker.
- Fallen logs laying directly on the ground and which can be easily stepped over make good waterbars and checkdams.

Checkdam construction:

- Where a drainage waterbar cannot be constructed due to high berms on both sides of the trail, construct a simple wood or rock dam perpendicular to the trail to collect silt and debris washing down the trail. Construction should be substantial enough to prevent hikers stepping on the dam from breaking it down.

- When the area behind the dam is full, build another dam further down the slope.

Waterbar maintenance:

- Remove all loose material from the trench; clear trench outside of tread to allow water to move away from the trail.
- Dig or scoop out accumulated silt from the trench; put all accumulated soil on the back side of the waterbar. Do not throw the soil to the side of the trail. Soil is a precious commodity as evidenced by eroded trails. The bottom of the trench next to the bar should be slightly below the level of the tread on the downhill side of the bar.
- If necessary, rebuild or repair the bar itself.

Obtaining tread material:

The following are good sources for tread fill material:

- Deposited material from up-trail erosion (ie., waterbars, checkdams).
- Material from the footpath.
- Material may also be pulled from the banks or berms of the footpath area.

The source for tread material needs beyond the above must be approved by park staff. Borrow pits are not to be dug. Any disturbance of the soil beyond the trail tread, berms, and associated water control features itself must have parkwide project clearance.

Equipment:

- Pick mattock, cutter-mattock, or Pulaski
- Shovel,
- A x ,
- Saw,
- Fire rake or McCleod.

New Trail Construction or Relocations

All proposed new trail constructions or relocations must be approved by the Superintendent and are subject to the parkwide project clearance. Project project clearance must be obtained anytime the soil is disturbed outside of the existing trail tread, berms, and associated water control structures. Any trail relocations and new trails are to be constructed in a manner which promotes hiker safety and resource protection. No new trails will be constructed within designated wilderness, regardless of opportunity class.

Future Actions

A. Use Global Positioning System (GPS) to assist in trail maintenance and management.

B. Revisit, revise trail maintenance standards and review trail system requirements as storm damage impacts are assessed.

CHAPTER 9
BACKCOUNTRY CAMPSITE MANAGEMENT

9.1 Implications from Recreation Ecology Research

Recreation ecology is the study of recreational impacts to protected natural resources. Such studies generally seek to identify the type and extent of resource impacts and to evaluate relationships between use-related factors and environmental factors. This section summarizes some research findings relevant to backcountry campsite inventory, monitoring, and management recommendations.

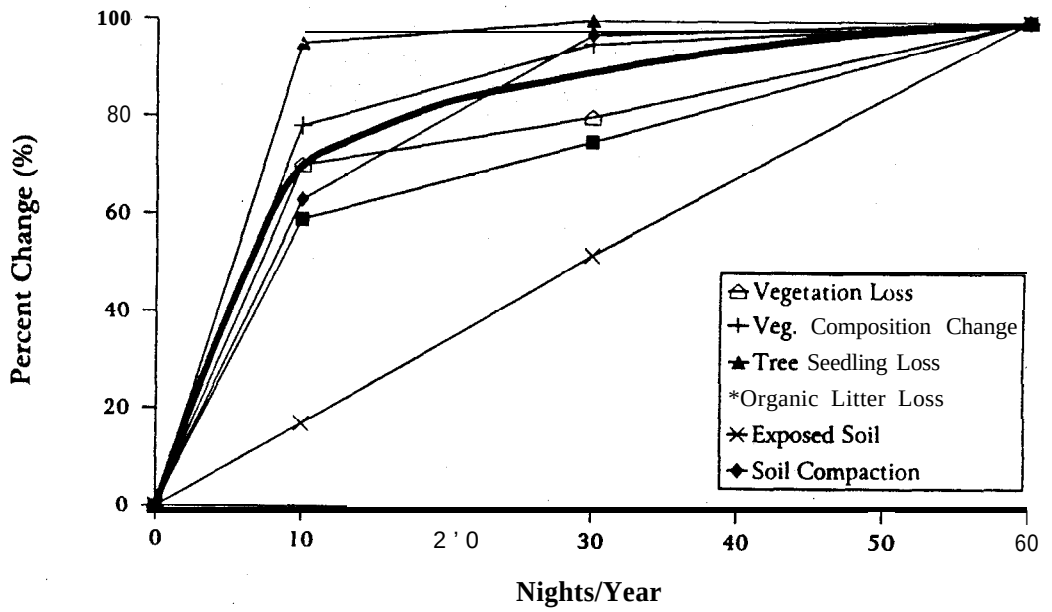
Studies of visitor impacts to both campsites and trails have documented that most resource impacts have a curvilinear relationship to level of use. In general, initial recreational use causes the most substantial changes while the rate of additional change diminishes rapidly with increasing use levels (Figure 9.1). A few impact parameters, such as loss of tree seedlings, are highly affected by very low levels of site use. At the other end of the spectrum, a few impact parameters, such as soil exposure, occur late in the impact process and appear to be related to use intensity in a more linear fashion. The majority of impact parameters, such as vegetation loss, are intermediate in their response. As depicted in Figure 9.1, research performed at the Boundary Waters Canoe Area Wilderness in Minnesota (Marion, 1987) has shown that the majority of change occurs on sites with less than a dozen nights of use per year.

Level of use is an important determinant of impact but many environmental factors (e.g. soil type and vegetation type and density) and use-related factors (e.g. type of use, party size, and visitor behavior) can be nearly as important. For example, in the Boundary Waters Canoe Area Study, vegetation ground cover averaged 52% on campsites with less than 25 % tree canopy cover, but averaged only 4% on campsites with 75100% tree cover. Sites with greater sunlight penetration support shade-intolerant grasses and sedges which, due to their growth forms, are significantly more resistant to trampling than forest herbaceous plants.

Use-related factors, over which managers typically have some control, can also be critical. Many studies have shown that on a per capita basis, hiking and camping with horses can cause several orders of magnitude more impact than hikers and campers on foot. Similarly, visitors who camp in large groups, build fires, trench around tents, and chop on trees can cause significantly more impact than visitors who obey minimum impact camping practices.

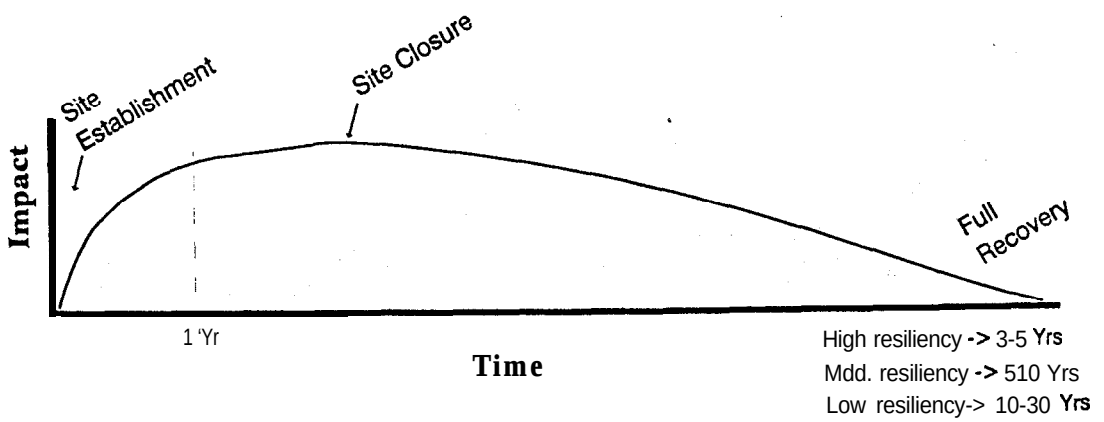
One final relevant recreation ecology finding pertains to the relationship between initial impact rates and recovery rates. Research has shown that while substantial impacts occur during the first year of a campsite's establishment, recovery rates are considerably longer (Figure 9.2). Recovery rates are dependent upon the resiliency of vegetation and soils. Vegetation resiliency is primarily related to environmental factors such as length of growing season and soil productivity. Soil resiliency is related to soil texture, soil moisture, freeze and thaw cycles, and biological activity in the soil.

Figure 9.1. Use/impact relationship for selected impact parameters from a study of campsites in the Boundarv Waters Canoe Area Wilderness.



Note: Change is expressed as a percentage of change on high use sites. Thus, approximately 70% of the vegetation loss that occurs on campsites receiving 60+ nights/year has already occurred on campsites receiving 10 nights/year. The generalized curvilinear use-impact relationship is depicted by the thicker black line.

Figure 9.2. A comparison of campsite impact and recovery rates.



9.2 History and Evaluation of SNP Campsite Management

SNP has experimented with each of the four major campsite management strategies: unregulated **at-large** camping, **visitor containment, visitor dispersal,** and **area closure.** The effectiveness of these alternative strategies is dependent upon how they are applied and requires an understanding of recreational ecology knowledge that, until recently, was poorly developed. The discussion that follows evaluates how these strategies have been applied at SNP.

Prior to 1972 the park appears to have permitted unregulated **at-large** camping in the backcountry. Under this management strategy, visitors camp wherever they want with few or no regulations regarding campfires or other camping practices. Such unregulated camping was quite common in the past and is still permitted in many lightly used NPS units today. While at-large camping maximizes visitor freedom, it is generally appropriate only under low levels of use due to the relatively high potential for resource impacts. When SNP's backcountry use expanded to 34,000 in 1967, managers judged the resulting resource damage to be unacceptable and implemented a **visitor containment** strategy with 39 designated campsites in 1972.

All visitors, without limits on number of groups, group size, or total capacity, were required to camp within sight of red camping posts or at backcountry shelters. Such regulations guaranteed excessive crowding, conflicts, and resource damage. Backcountry use reached 121,000 by 1973, three times the current visitation (see chapter 2, Table 2.1). It is not surprising that such use overwhelmed the 39 designated camping areas. This strategy was abandoned in 1974 with implementation of a **visitor dispersal** strategy initiated through the establishment of new regulations (see chapter 1, Table 1.1).

Under the dispersal strategy visitors were encouraged to camp away from trails, streams, shelters, roads, developed areas, and other groups. In addition, permits were required, group size was limited to 10, camping stays at each site were restricted to two consecutive nights, and some low-impact camping information was communicated. While more effective than the previous strategies, this approach works best only under conditions of low use. In its purest form, visitor dispersal seeks to minimize visitor impacts (and social problems) by distributing visitor use to such a large number of "sites" that none develop any obvious signs of wear. The extremely low trampling resistance of most forest ground vegetation communities tolerate very little camping activity and is often eliminated by more than 5-10 nights of use per year. The "capacity" of more open grassy vegetation types can support much higher use, perhaps as much as 15-20 nights per year (Marion, 1992).

Current and past experience has shown that SNP's dispersal regulations have been largely unsuccessful in dispersing visitors camped in the backcountry. An extensive campsite inventory completed in 1983, nine years after implementation of the dispersal regulations, revealed approximately 1,300 identifiable campsites. More importantly, 80% of these campsites were judged to be in violation of the "within sight of trail" regulation, and 25% were in violation of the "within 25 feet of streams" regulation (Marion and Haskell, 1988). A decade later, a second, more comprehensive survey located approximately 700 campsites, 68% of which were judged to be in violation of one or more locational regulations (Tables 9.3, 9.4, and 9.5)

(Marion and Williams, 1993). Furthermore, 80% of the campsites were "obvious" and 35 % had lost nearly all of their vegetation cover and had bare soil exposed in core areas. The results of these surveys indicate that visitors have not been sufficiently dispersed to avoid the creation of recognizabie campsites or even the loss of organic litter and exposure of bare soil.

Management efforts to achieve backcountry camping dispersal have been unsuccessful, both in SNP and elsewhere, due to a number of factors. Visitor behavior is perhaps the most significant factor. Many, perhaps most, visitors simply do not want to disperse beyond sight of trails and other groups, away from water or to locate and camp on previously unused sites. Many visitors enjoy camping close to other groups for social reasons, others fear getting lost when out of sight from trails, and some may simply feel too tired at the end of a long hike to extend the necessary effort to locate a legal campsite. From a visitor's perspective, pre-existing campsites are also more convenient, comfortable, and require less work to use. Finally, water and other scenic attractions in the backcountry will always attract larger numbers of visitors than less interesting areas. All studies of unregulated visitor distribution in backcountry and wilderness areas have found use patterns to be highly uneven. Management efforts to alter these natural tendencies through regulations are perhaps doomed to failure without substantial and prohibitively expensive educational and law enforcement programs.

A second major factor which explains poor dispersal success in SNP is the mountainous topography. Many of the Park's trails follow the bottoms of drainages where flat terrain adjacent to streams permits good opportunities for camping. Unfortunately, many of the trails parallel these streams so closely that regulations prohibited camping in most of the best locations. These are also areas commonly containing cultural resources. Prior to changes in legal camping locations, more than 25 feet from streams and out of sight of trails, legal camp sites were uncommon along such drainage bottom trails due to excessive slopes. Prior to 1997 regulations changes, a difficult burden was placed on visitors to find legal campsites in many areas of the Park.

Results from the 1992/93 campsite survey (Table 9.5) suggest that the dispersal policy at SNP appeared to cause considerably more resource impact than necessary. The curvilinear use/impact relationship and various barriers which inhibit visitor dispersal contribute to the conclusion that the most effective campsite impact minimization strategy is visitor containment (designated sites), at least in areas receiving heavy use. Under a visitor containment strategy, aggregate impact can always be reduced by limiting the total number of designated sites. However, a number of factors act to limit the extent to which containment is appropriate. The resource impacts of extremely concentrated use, as shown by SNP's own history with this type of policy, quickly reach levels which are unacceptable to both managers and visitors alike. Vegetation and organic litter loss are generally recognized as unavoidable on designated sites and these changes are reversible over fairly short periods of time. A more significant and unacceptable resource impact is soil erosion, which, in contrast to other campsite impacts, is not self-limiting and represents a more lasting form of resource deterioration. The concentration of use on fewer and fewer sites also compounds problems with social crowding and conflicts. While designated single-party campsites located out of sight from each other is the most effective policy for ensuring visitor solitude, there must be enough sites to accommodate groups for any given night.

The final campsite management strategy, **area closures** to camping, was implemented in 1977 for a number of popular backcountry areas. Such closures were applied primarily to areas which received heavy day and overnight visitation, both to avoid resource impacts and to ease crowding and conflict. On a smaller scale, area closures have been established for individual campsites through the placement of "No Camping" posts on heavily impacted illegal campsites. From a resource perspective, area closures are effective when areas which are particularly sensitive to visitor impacts are closed and use is shifted to more resistant environments. Otherwise, area closures have the temporary effect of resolving problems only to have them reoccur a few years later in the new areas receiving the additional use. From a social perspective, area closures can effectively resolve crowding and conflict by geographically separating camping activities from day users. In this instance the issue of fairness, which type of backcountry use is being removed, is the primary concern.

A rest/rotation campsite management strategy is almost always inappropriate due to the large ratio of impact to recovery rates (Figure 9.2). In an area of moderate resiliency such as SNP, a campsite impacted in one year might require 5 years to recover. A rest/rotation program would therefore require 4 campsites in various stages of recovery for each campsite in use. Few areas have sufficient resiliency and numbers of potential camping locations to support such a program and visitor compliance would be particularly difficult to achieve.

Table 9.3. Number, size, and amount of soil exposure on campsites by Condition Class.

Condition Class	Campsites		Campsite Size (ft^2)	Area of Soil Exposure (ft^2)
	Number	Percent		
1	141	20	229	0
2	306	45	328	0
3	164	. 24	644	163
4	69	10	757	448
5	4	1	1765	1573
	685			
2.2	-- Averages --		434	271

Table 9.4.

CONDITION CLASS DEFINITIONS

Class 1: Campsite barely distinguishable; slight loss of vegetation cover and /or minimal disturbance of organic litter.

Class 2: Campsite obvious; vegetation cover lost and/or organic litter pulverized in primary use areas.

Class 3: Vegetation cover lost and/or organic litter pulverized on much of the site, some bare soil exposed in primary use areas.

Class 4: Nearly complete or total loss of vegetation cover and organic litter, bare soil widespread.

Class 5: Soil erosion obvious, as indicated by exposed tree roots and rocks and/or gullying.

Table 9.5. Number and percent of illegal campsites by campsite legality factor.

Campsite Legality Factor	Illegal Campsites	
	Number	Percent
<1/2 mi. from developed park areas or < 250 yds from paved roads	33	5
< 25 ft. from streams	172	25
In sight of formal park trails	396	58
In sight of "No Camping" signs	49	7
Total number of illegal campsites, any factor	463	68

9.3 Backcountry Campsite Management Strategies

Park managers have a dual mandate to provide quality recreational experiences and protect cultural and natural resources and processes. The management of backcountry recreational use necessitates a compromise between these mandates because impacts are an inevitable consequence of use. Managers must strive to minimize rather than eliminate recreational impacts, with consideration given to both individual site impact, aggregate impact, and the costs to visitors of compliance. These factors, as well as management, environmental, and use-related factors which determine the effectiveness of campsite management strategies, must be evaluated in the formulation of a comprehensive campsite management program.

Campsite Management Recommendations for Actions Beyond 1997

The consideration of alternative campsite management approaches will begin with a review of potential alterations to current policies. For reasons discussed previously in this chapter, reliance on a dispersal strategy alone is not recommended. Dispersal has the potential to work well in many areas of the Park which receive low use. The success of this strategy could be increased through Leave No Trace educational efforts that emphasize site selection criteria promoting the selection of legal and impact resistant campsites. Interpretive efforts might also effectively reduce some forms of impact, such as tent ditching, campfire building, and tree damage, that are more strongly related to depreciative behavior than visitor numbers. Improved low impact information conveyed through brochures and trailhead posters could increase the effectiveness of the current dispersal strategy at little cost. Expanded personal communication of low impact information through the permitting process, interpretive talks, and ranger patrol contacts in the backcountry represent more effective but higher cost educational approaches.

Some form of visitor containment needs to be incorporated into the current system to reduce impacts in moderate to heavy use areas. Recreation ecology researcher David Cole has advanced an educational approach which encourages dispersal in remote areas and containment in more popular areas. Visitors who know and want to apply low impact camping practices are instructed to locate and use pristine, impact resistant sites, using care to avoid damage and to naturalize the area following use. Visitors in more popular areas are instructed to locate and use moderately impacted campsites. Visitors are directed to avoid lightly impacted sites, as their use will rapidly result in higher impacts, and highly impacted sites, as their use will prevent the recovery of impacts which have reached unacceptable levels. This educational approach is based on recreational ecology relationships (Figures 9.1 and 9.2) and has been implemented in a number of U.S. Forest Service wilderness areas. However, its effectiveness is unknown and at least one study found the educational message to be too difficult for visitors to comprehend and apply in the selection of appropriate campsites.

A more regulatory but potentially more effective alternative is the use of designated campsites in popular backcountry locations. Under this approach, small clusters of impact resistant designated campsites would be established in areas with concentrated use where the current dispersal system is ineffective. The number and location of designated sites would be determined through examination of trail use data, the number, distribution, and condition of

existing campsites from monitoring data, and field reconnaissance work. Designated camping regulations can be restrictive on visitor freedom, so an alternate form of containment is also envisioned. In moderately used areas, visitors might be instructed to camp on existing legal (established) but non-designated campsites. This offers visitors greater flexibility in choosing their camping locations, yet encourages the repeated use of a limited number of sites. Dispersed camping, with an emphasis on the selection of previously unused sites, might also be permitted but would be encouraged only in lightly used areas.

The LAC planning and management model, being incorporated into this BWMP, will provide an overall decision making framework for the implementation of these camping options. Which options are emphasized would be primarily dependent upon ROS class designations.

Campsite Management Recommendations bv Opportunity Class

While more complex than the present camping policy, the proposed policy combines elements of both the containment and dispersal strategies in a way that maximizes both resource protection and visitor freedom. Furthermore, a more flexible and effective response to changes in amount, type, and distribution of use is permitted. Under the LAC framework, significant increases in use and impacts will trigger careful assessments of causes, and following such an analysis, an evaluation of a range of corrective management actions. Such actions include the extent of educational efforts, campsite rehabilitation, backcountry patrols, and regulation enforcement efforts; the number and type of regulations; management emphasis among the three backcountry camping options; use limitation; and area closure. In general, indirect management actions which are least intrusive to the backcountry visitors' experiences, such as visitor education and campsite rehabilitation, are preferred over more direct actions. Management judgement will be paramount in the selection of preferred actions, however, as the extent, complexity, intensity, or visibility of problems vary. Management objectives, which guide the appropriateness of alternative management actions, also vary by opportunity class. It is also important to note that diminishing use levels and impacts should lead to a reversal of those policies which unnecessarily restrict visitor freedom. Improving conditions, as indicated by monitoring, should alert managers to consider rolling back previously implemented actions to maintain a balance between resource protection and recreation objectives. Preferred responses to increasing levels of use and impact are also presented below by opportunity class.

Appalachian Trail Wilderness and Non-wilderness

This opportunity class includes the entire AT and receives moderate to fairly intensive use, depending on location. The preferred form of camping for 'long-distance AT hikers are the huts which exist every 10-15 miles along the trail. The preferred form of camping for other AT hikers is the use of designated campsites in heavily used areas and existing legal sites in moderately used areas. Dispersed camping would also be permitted although not emphasized. Specific backcountry camping requirements are provided to park visitors by site maps/bulletins.

The following actions or enhancements to existing programs, ranked in approximate order of preference, would be considered under conditions of increasing use and impacts:

1. Information and education,
2. Backcountry patrols and visitor contacts,
3. Regulations enforcement,
4. Campsite rehabilitation,
5. Increase number of designated campsites,
6. Eliminate dispersed camping option,
7. Eliminate existing legal (established site) camping option,
8. Restrict use through travel zone or campsite rationing system.

Threshold Wilderness and Non-wilderness

This opportunity class is typically adjacent to developed frontcountry areas and receives intensive use. The preferred form of camping is the use of designated campsites in heavily used areas and established legal sites in moderately used areas. Camping may be restricted to using only designated sites in some of the most popular areas. Dispersed camping would not be permitted in this opportunity class.

The following actions or enhancements to existing programs, ranked in approximate order of preference, would be considered under conditions of increasing use and impacts:

1. Information and education,
2. Backcountry patrols and visitor contacts,
3. Regulations enforcement,
4. Campsite rehabilitation,
5. Increase number of designated campsites,
6. Eliminate established site camping option in additional areas,
7. Eliminate established site camping option entirely,
8. Restrict use through travel zone or campsite rationing system.

Semi-primitive Wilderness and Non-wilderness

This opportunity class is intermediate between Threshold opportunity class areas and the truly remote areas of the backcountry. The preferred form of camping is the use of established sites, although use of designated campsites may be required in the more popular areas. Dispersed camping would also be permitted although not emphasized.

The following actions or enhancements to existing programs, ranked in approximate order of preference, would be considered under conditions of increasing use and impacts:

1. Information and education,
2. Backcountry patrols and visitor contacts,
3. Campsite rehabilitation,
4. Regulations enforcement,
5. Increase number of designated campsites,
6. Eliminate dispersed camping option,
7. Reduce emphasis on established site camping option, eliminate option in some areas,
8. Restrict use through travel zone rationing system.

Primitive Wilderness and Primitive Non-wilderness

These two opportunity classes include the most remote and lightly used areas of the backcountry. The preferred form of camping is the use of dispersed camping, with an emphasis on the selection of previously unused camping locations and the use of low impact camping techniques. Camping on established sites would also be permitted but discouraged.

The following actions or enhancements to existing programs, ranked in approximate order of preference, would be considered under conditions of increasing use and impacts:

1. Information and education,
2. Campsite rehabilitation,
3. Eliminate established sites camping option,
4. Restrict use through travel zone rationing system.

Regardless of opportunity class, areas of the backcountry could be closed to all camping which are particularly susceptible to impacts, contain critical wildlife habitat, contain vulnerable cultural resources, or support rare, endangered, or threatened species. In addition, special provisions are recommended, limited to the Threshold opportunity class, to accommodate some recreational uses that are deemed appropriate but have a higher potential for resource damage. Large groups who demonstrate a need for primitive backcountry group camping experiences might be served by developing several clusters of designated campsites (party size limited to 10/site) for use on a reservation basis. Visitors wishing to camp with horses might be accommodated by developing several special horse use campsites, also for use on a reservation basis.

Proposed **Backcountrv Camping Regulations**

Proposed new backcountry camping regulations are presented in Table 9.6. While some regulations apply to the entire backcountry, others are specific to each of the three camping options. Another significant change from former regulations is the replacement of “within sight” camping restrictions by distance restrictions. This is recommended because: 1) visibility assessments are inherently variable and dependent upon time of year and exact positioning and color of tents, 2) over half (1992/93 Campsite Inventory) of the existing campsites are illegal because they are within sight of formal trails, and 3) “within sight” restrictions are subjective and difficult to enforce. The establishment of a minimum 20 yard setback from forma! trails for designated and established campsites should preserve hiker and camper solitude while permitting an expansion of the number of “legal” camping locations. Where convenient, distance restrictions are communicated in yards due to their close correspondence to the typical human stride, thus facilitating their application by visitors and enforcement by rangers.

Table 9.6. Backcountry Camping Regulations

NOTE: Enforceable regulation statements are in **bold.**

	Parkwide Backcountry Camping Regulations
1.	**Backcountry camping permits are required.**
2.	**Group size is limited to 10 people.**
3.	**Campfires are prohibited** (except at fireplaces at huts and shelters).
4.	**Store food so wildlife cannot have access to it. Hang food in a tree at least 10 feet above the ground and at least 4 feet from the tree trunk.**
5.	Protect water resources. **Camp at least 10 yards from any stream.**
6.	Protect cultural resources. **Camp at least 50 yards from standing building ruins such as stone foundations, chimneys, log walls, etc.**
7.	Provide for solitude. **Camp at least 50 yards from another camping party or "no camping" post.**
8.	**Camp at least 100 yards from a hut, shelter, or cabin.** The park limits camping at huts to long term hikers (trip duration of 2+ nights in park) and one night stay. Shelters are for day use only.
9.	**Camp at least 1/4 mile from Skyline Drive and park boundary. Camp at least 1/2 mile from a park facility such as campgrounds, picnic areas, visitor centers, lodges, wayside restaurants, and Camp Hoover.**
10.	Use good toilet habits. **Relieve yourself at least 20 yards from streams, trails, or roads. Bury solid human waste in a hole at least three (3) inches deep.**
11.	**Pets must be leashed at all times. Pets are not permitted on some trails.**
12.	**Carry out all trash.** "Pack it in. Pack it out."
	Established Campsite Regulations (high & moderate use areas)
1.	**Camp** in an existing campsite **at least 20 yards from a park trail.**
2.	**No more than two (2) consecutive nights in the same location.**
	Dispersed Campsite Regulations (low use areas)
1.	**Camp** in an undisturbed area **at least 50 yards from a park trail.**
2.	**No more than one (1) night in a single location,** defined as within 50 yards from the previous site.
	Designated Campsite Regulations
1.	**Camp and cook in designated site.**
2.	**No more than two (2) consecutive nights at a single campsite.** Designated campsites are found in the following areas: currently none.
	No Camping Zones (Day use only)
1.	Four areas designated as outstanding natural areas are closed to camping: Old Rag Mtn. above 2800', Summit of Hawksbill Mtn., White Oak Canyon between upper falls and Cedar Run Link Trail, and Limberlost Trail area.

Programs Needed to Support Proposed Campsite Management Policy

Four management programs are viewed as essential to the success of this proposed campsite management policy:

1. The LAC and ROS models provide an excellent framework to guide management decision making. These models, incorporated into the BWMP, provide for a more objective yet flexible approach to backcountry management.

2. An improved program emphasizing staffed permit issuance is needed to effectively implement the proposed campsite management policies. The new policies are more effective and flexible but these advantages are dependent upon the park staff's ability to reliably communicate them to backcountry visitors.

3. A permanent program of campsite monitoring is viewed as critical for a number of reasons. Monitoring will enable managers to identify and quantify resource impacts as amount and type of use changes over time. Monitoring thus provides an objective method for comparing conditions to management standards reflecting the limits of acceptable change. Monitoring data can be analyzed to help evaluate the causes of problems and to identify effective management actions, and over time, the effectiveness of implemented actions. Finally, monitoring data can be used to identify and assign priorities to campsite rehabilitation efforts.

4. A capability to locate, establish, and maintain impact-resistant designated campsites and to rehabilitate existing legal and dispersed campsites is needed. Procedures to accomplish these objectives have not been developed and may require additional research or management experimentation. Parkwide project clearance is required for each proposed designated campsite.

Selection and Management of Designated Campsites

The BWMP recommends that formal designated campsites be considered as a management option in all but the Primitive Wilderness and Primitive Non-wilderness opportunity classes. Designated campsites might be needed in the following situations: (1) in the most popular backcountry areas that receive high overnight visitation, (2) in areas that receive moderate overnight visitation but management experience and monitoring data show that the "established site" camping option has been ineffective in controlling resource or social impacts or illegal camping, (3) in areas, regardless of use level, where camping is considered appropriate but the sensitivity of natural or cultural resources requires camping only in designated sites, or (4) to accommodate particular types of use, such as horseback riders or larger groups, which require special facilities. Project clearance, including potential disturbance of sensitive natural, cultural, and archeological resources, is required prior to creation of any new designated campsites.

Pit toilets may be necessary at high use designated sites to minimize human waste impacts. Their need may be determined through management judgement or by monitoring following site

establishment. The appropriateness of pit toilets in wilderness, particularly larger enclosed structures, should also be carefully considered. Bear poles or storage lockers for safeguarding food may also be needed at designated campsites to prevent the attraction of bears.

Designated campsites may be available on a first-come, first-served basis or, where necessary, by reservation. Site reservation systems substantially restrict visitor freedom and will be avoided where possible. Visitors must be warned that a limited number of designated sites exist in popular areas and to allow time for further travel when these sites are full. Where possible and appropriate, site numbers should be adjusted to accommodate the number of groups seeking to camp during average high use periods (not peak use periods).

Designated Campsite Selection Criteria

It is proposed that designated campsites be developed either singly or in clusters of up to three to five campsites. Figure 9.7 illustrates one possible arrangement in a typical valley bottom setting. Social trail development is minimized by placing campsites out-of-sight from the trail and on the opposite side of a stream. A signed and improved access trail and stream crossing will help prevent formation of multiple access trails. Individual site access trails approach directly from the stream, anticipating the need for easy access to water. Separation of sites by at least 20-40 yards will enhance solitude. Placement of other facilities such as pit toilets or food storage facilities should also anticipate and minimize the development of additional trails.

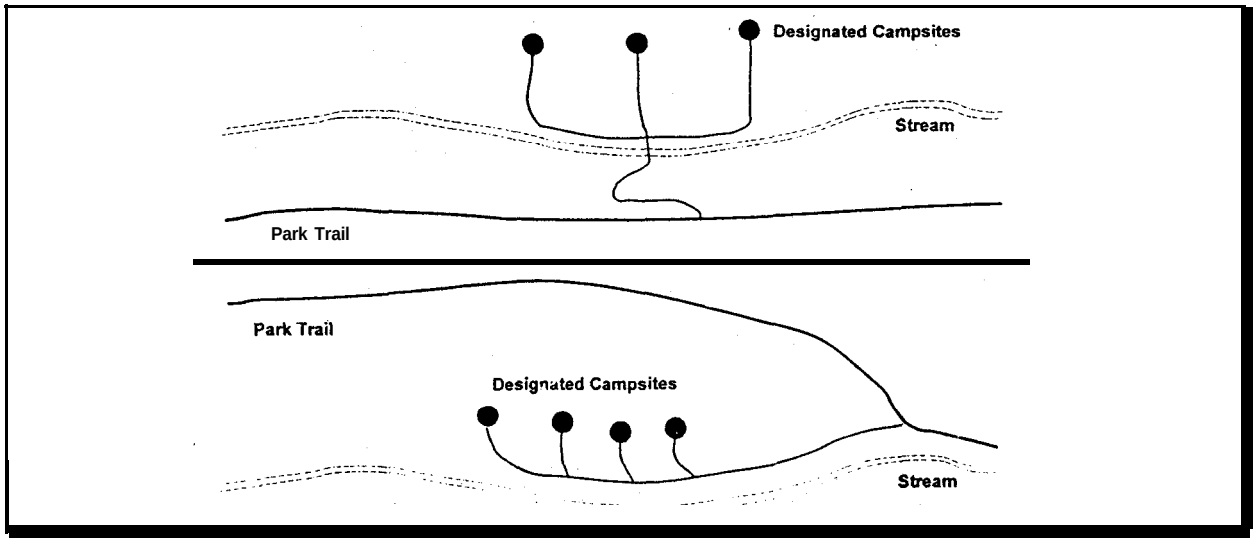


Figure 9.7. Illustration of a typical arrangement for the placement of designated campsites.

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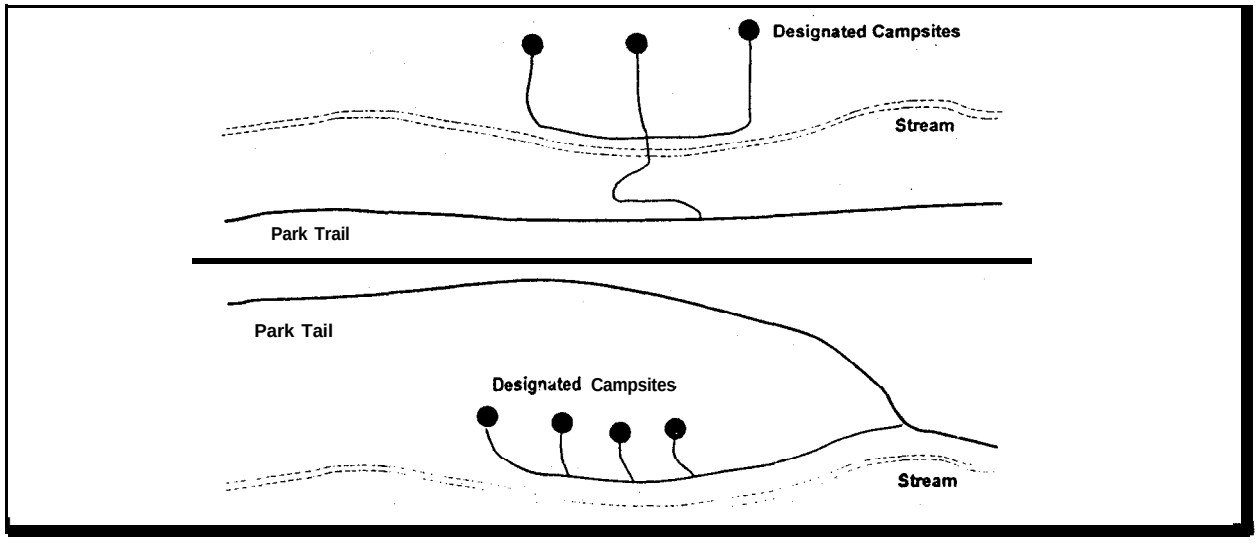


Figure 9.7. Illustration of a typical arrangement for the placement of designated campsites.

Campsite selection criteria (Table 9.8) are designed to favor campsites that will be recreationally durable and ensure visitor solitude, although other factors are noted and must be considered. These criteria should be periodically reviewed and modified as needed, particularly as monitoring data reveals how different campsites stand up to intensive or long-term use. Management experience and research in other areas shows that a few types of changes are particularly troublesome on designated campsites that receive intensive use. The following section discusses the selection criteria and offers recommendations for managing campsites to minimize these problems.

Campsite location criteria ensure adequate spacing from formal park developed areas, boundaries, trails, between campsites: and from water resources. Ideally campsites should be located out-of-sight from formal park trails and from other campsites to enhance the solitude of both hikers and campers. However, steep slopes make achieving this goal a challenge so criteria are based primarily on distances. Campsites should also be located to minimize the development of additional trails. Access trails should be designed and constructed to avoid resource impacts and the development of user-created trails. Campsite access trails might be marked with small camping symbol signs or with paint blazes and should exit the park trail in a perpendicular fashion. Trails should anticipate and accommodate the need for easy access to water sources and to toilets or food storage facilities when present.

Campsite expansion criteria emphasize selection of sites with limited expansion potential due to steep slopes, rockiness, dense vegetation, or poor drainage. A critical goal of site selection is to identify site locations that will be unable to expand even under conditions of repeated heavy use. In the ideal situation sites with natural barriers to expansion are located and used. However, such occurrences are rare and other options are frequently needed:

1) Place campsites in areas where the prevailing slope is approximately 7 to 12 percent. A minimal amount of cut and fill work* can create small campsites that have more gentle slopes of two to three percent, yet the steeper off-site slope effectively prevents campsite expansion.

2) Place campsites in extremely rocky areas where rock removal and the addition of soil can create small campsites that cannot expand.
3) Firmly anchor a 4x4 campsite post and encourage or require visitors to place tents and cooking areas within a specified distance (10 yards) of the post.

* Note: Soil disturbance or removal requires cultural resource compliance and archeological survey. Archeological survey is not required in areas with slope of + 15% or in proven previously disturbed areas. Fill can be imported to areas with vehicular access.

Campsite development and maintenance work can limit campsite expansion by ensuring the existence of two or three adequate tenting locations (10 x 10 feet) on each site. These locations should be improved where necessary by leveling soil to create a two to three percent slope, and removing or covering rocks, stumps, or exposed roots. Camping in adjacent off-site areas can be discouraged by partially burying large rocks or by digging shallow pits (***note** cultural resource compliance requirement) in some areas and mounding soil in others.

Campsite slope criteria favor sites with a gentle slope (two to three percent) that facilitate drainage yet minimize soil erosion. Slope is a critical factor influencing erosion potential because intensive trampling on designated sites causes them to lose most vegetation and organic litter and expose soils. Campsites with naturally ideal slopes are preferred (and awarded preference points) over sites where cut and fill work would be needed to create such slopes. Just as on trails, routine maintenance should evaluate and correct any drainage problems that develop over time on campsites.

Vegetation composition and vegetation cover criteria favor sites with impact resistant vegetation or areas that have little vegetation to lose. The most resistant campsites are those under open overstories supporting a grassy ground cover. Unfortunately such areas are relatively rare. Research results also indicate that campsites with a northern aspect or located in oak forests lose least amount of vegetation cover. Vegetation loss can be minimized by selecting sites under particularly dense forest canopies. Such areas often have less than 20 percent vegetative ground cover and thick organic litter horizons. Campsites placed in these areas have less vegetation cover to lose, are not visually obvious, and have thick organic layers which minimize soil exposure. Furthermore, the high organic litter production of dense forest canopies annually renews organic materials that cushion compactive forces and reduce the potential for soil compaction.

Tree damage, while a common problem associated with designated site camping, is not addressed by site selection criteria because tree damage is primarily a function of visitor behavior. Campsite regulations prohibiting campfires and educational ***Leave No Trace*** camping information should adequately resolve this problem. Damage to trees from visitors hanging food bags can be addressed through the provision of bear poles on some or all designated campsites. The unauthorized use of axes and saws in backcountry should be discouraged or perhaps regulated.

Table 9.8 Campsite selection criteria.

Points	Campsite Selection Criteria
	1. Campsite Location
Required	Campsite is located greater than: ½ mile from a park facility (other than shelters); 1/4 mile from Skyline Drive or park boundary; 23 yards from a formal park trail, campsite, camping prohibition sign; 50 yards from standing building ruins (ic. foundations, walls, chimneys); 10 yards from any stream or water source.
1	Campsite is located out of sight (in summertime) *or* more than 40 yards from any other campsite or hut/shelter/cabin..
1	Campsite is located out of sight *or* more than 40 yards from a formal park trail.
1	Campsite is located more than 20 yards from any stream or water source.
	2. Expansion Potential
3	Poor expansion potential: off-site areas are completely unsuitable for any expansion due to steep slopes, rockiness, dense vegetation, and/or poor drainage.
2	Moderate expansion potential: Off-site areas moderately unsuitable for any expansion due to the factors listed above.
-1	Good expansion potential: Off-site areas are suitable for campsite expansion, features listed above provide no effective resistance to campsite expansion.
	3. Campsite Slope
Required	Most areas of the campsite have gentle slopes (2-4%) or they can be easily created.
1	Most areas of the site already have gentle slopes.
2	**4. Vegetation Groundcover**
	The composition of ground vegetation in off-site areas is predominantly grasses or sedges, as opposed to broadleafed herbs, ***or*** off-site vegetation cover is very sparse (less than 20%).
1	**5. Forest Canopy**
	The composition of the forest canopy in the campsite 'area is predominantly oaks.
1	6. **Aspect**
	The landform upon which the campsite is situated has a northerly aspect.
	7. Pre-existing Campsite
1	The area contains a pre-existing campsite with acceptable characteristics.

Applying Selection Criteria

Once a decision has been made to establish new designated campsites the site selection process begins with a review of any cultural sites or critical habitat for R,T&E species or other important wildlife known to occur in the vicinity of the proposed campsites. Though exemptions may be granted, designated campsites will generally not be placed in close proximity to sensitive cultural or natural resources, Other site selection considerations not included in the Table 9.8 criteria include such factors as proximity to water sources and visitor attractions, aesthetic appeal, visitor safety, and visitor distribution patterns.

The campsite selection criteria in Table 9.8 will be applied during field reconnaissance surveys to identify and rank potential designated campsite locations. As a general rule, twice the number of desired new site locations should be identified and rated to ensure the search is thorough and that the most highly rated sites are selected. Pre-existing sites should be used whenever possible but only when they score highly on site evaluation criteria. Common but critical deficiencies of many existing sites is their proximity to trails, water, and other sites and a strong potential for expansion. Responsibility for this work would be assumed by district backcountry rangers, who would also prepare campsite proposals to be approved on a case-by-case basis. Consultation in the site selection and approval process across district lines is recommended to ensure parkwide consistency.

campsite Development

In most instances campsite development will require field work to construct site access trails and smooth and gently sloped tentsites. Some type of special blazing or small camping symbol sign is necessary at junctions between park trails and campsite access trails. For sites located in the vicinity of shelters a site map will help to orient visitors to campsite locations. Trails to water sources, toilets, and food storage facilities should also be anticipated and constructed. At campsite locations a camping post or camping sign is needed (preferably numbered) to officially designate the site, distinguishing it from nearby illegal sites that may be present or created.

Given the group size limit of ten individuals campsites should have either two or three tentsites large enough to accommodate three to four person tents (10x10 feet minimum). The number of tentsites at each site will depend on site-specific geography but the goal should be at least a 50/50 split between two and three tentsite campsites. Smaller cooking areas can also be provided or some tentsites can elongated to create such space. Tentsites may be created in a number of arrangements. They can be developed singly with short connecting trails or placed together in a rectangular or circular configuration. Their surfaces should have a two to four percent slope and be free of depressions, stumps, roots, or protruding rocks. These can be produced by limited excavation (***note** cultural resource compliance requirement) and fill work or by importing fill in areas with vehicular access. Where needed, crib logs to retain soil on slopes can be used. Two logs that join at the downslope end of the tentsite are preferred over the use of three of four logs that will appear more artificial and unnatural. The goal of all work, particularly within wilderness, is that it be the minimum necessary to accomplish its purpose and substantially unnoticeable to campsite visitors. For example, the shape of tentsites should be

rounded rather than square and cut and fill work should have blended and irregular rather than sharp and straight boundaries.

Impacted Backcountry Campsite Rehabilitation

An applied aspect of the LAC planning framework is managing resource impacts when an established standard is being approached or exceeded. A variety of use-related, environmental, and managerial factors are subject to manipulation by park managers in efforts to prevent, minimize, and rehabilitate such impacts, The recovery of campsites which have exceeded specified standards can be hastened through a campsite rehabilitation program. However, rehabilitation efforts merely treat symptoms (the impacted areas) and must be accompanied by management actions which address the causes for the substandard conditions.

Resource indicators at SNP which address backcountry campsite impacts focus on the total impacted area of a site, amount of vegetation loss within a campsite, total amount of exposed soil within a campsite, number of sites exceeding a particular condition class, and density of campsites within an area.

If campsite impact standards along a particular trail are exceeded, backcountry managers have a variety of management strategies available for reducing site impacts, including: (1) educating users to low impact camping techniques, (2) enforcing camping regulations, (3) shifting use to more durable sites, including designated sites, (4) rehabilitating campsites, (5) closing campsites, (6) rationing use, and (7) closing selected areas to camping.

Campsite management strategies at SNP are based on opportunity classes and attempt to limit the size and amount of exposed soil on designated, existing legal, and dispersed campsites. Campsites which are "illegal" or exceed impact standards within an opportunity class should be targeted for rehabilitation or closure.

Campsite Rehabilitation Techniques

Research indicates that once a typical campsite is moderately impacted, it may take ten years or more without any use for complete recovery. In a National Park or wilderness area, backcountry managers may want to accelerate this process for a variety of reasons. A typical goal of backcountry campsite rehabilitation is to reduce site size or to discourage use of the site entirely. Basic techniques used in site rehabilitation include: (1) creating an uneven surface, (2) loosening soil and reintroducing organic material, (3) naturalizing site appearance, (4) eliminating campsite accessibility, and (5) site closure signing (if needed).

Creating an uneven surface: The goal of creating an uneven surface on an impacted site is to reduce its visual attraction and suitability for tenting to potential campers. One of the most reliable techniques used at SNP is to embed rocks into the soil on the site. Large rocks are moved onto the site, then set into a hole so that they are difficult to move. Another option is to use a grubbing tool to create mounds and shallow dips on the site. ***note** Cultural compliance is required for this activity.

Loosening soil and reintroducing organic material: Another goal of site rehabilitation is to relieve soil compaction and to accelerate the process of natural reseeding. This can be accomplished by loosening the soil surface with a fire rake or pulaski. This is followed by raking in organic material, such as leaf litter and duff material from an off-site location into the upper soil horizon. Introduction of leaf litter and other organic materials includes natural seeding which may accelerate the revegetation and renaturalization process.

Naturalize the appearance of site: Another method of rehabilitating a site is to blend the impacted site into the surrounding scene to reduce its potential for future use. This is typically done by dragging large pieces of dead and downed wood onto the site and spreading leaf litter across the site. Fallen wood catches and holds blowing leaves in autumn, further accelerating naturalization of the site. The use of dead wood on a site near a shelter or hut site is usually not time well spent, since the wood is used in fireplaces. Another option is active revegetation which may be appropriate on certain sites, but is more intensive management, often with marginal success rates.

Eliminating social path to site: The goal of eliminating informal trails to rehabilitated sites is to further reduce the opportunity that the site will be found and used again. This is often the most difficult step in rehabilitation to achieve. The typical method used is physically obstructing paths for some distance at the junction where they leave the main trail. Dead and downed wood is used for this purpose, but wood settles to the ground over time and often needs to be replaced from year to year. Another option is revegetation of the path with fast growing, hardy, and obstructive vegetation such as blackberry vines or greenbriar. The most effective method for eliminating a social trail is to eliminate or reduce the chance that the trail is recognized by a visitor. This can be accomplished in a variety of ways, but whichever technique is selected must be applied to the entire length of the social trail visible from the main trail or other campsites.

Site closure by signing: Signing can be used in conjunction with site rehabilitation, but should not be considered a method of site rehabilitation by itself. Closure signing might be used when rehabilitation techniques outlined above do not appear adequate to reduce use on a particular site, or when visitor use persists in spite of rehabilitation attempts. Wooden 4x4 posts with a routed message: "NO CAMPING" have been used since the late 1970's to close impacted, illegal campsites with fair success. These signs are subject to damage by vandals and bears. Literature suggests that signs with a brief explanation of why the site is closed may gain greater compliance, such as, "NO CAMPING - REVEGETATION AREA." As outlined in Chapter 6.8, the individual closure signs should not be viewed as permanent signs in the backcountry and their need should be reviewed annually at the district level in relation to the management objectives for that opportunity class.

Campsite Rehabilitation at SNP

In 1983 backcountry rangers at Shenandoah made the park's first inventory of impacted backcountry campsites. The campsite inventory revealed the existance of 1300 campsites, which rangers believed represented about 80% of the impacted campsites in the park at the time. In

conjunction with the campsite inventory, a 3 year campsite rehabilitation study was conducted, using 30 campsites per district for a total of 90 sites. The results of the study are found in Analysis of Visitor Impacts and Rehabilitation Methods for Backcountry Campsites at SNP (Marion and Haskell, 1988) and some of the findings are summarized as follows:

In general, the rehabilitation work was successful: one-third of the rehabilitated campsites disappeared; 45 % of campsites decreased more than 50% in size; 25 % of campsites remained the same size, while 3% increased in size. Note, however, that a decrease in campsite size does not imply ecological recovery, which may take more than 10 years.

Campsites at lower elevations had considerably lower rehabilitation success than those at higher elevations. These campsites are typically found along streams, and in dense hemlock stands where recovery of ground vegetation would be expected to progress slowly and visitor use levels are high. Rehabilitation success was highest for campsites in early successional vegetation types where the ground vegetation is typically dominated by grasses and sedges which are more resistant to trampling.

Rehabilitation success was higher for those campsites which were not visible from the nearest established trail and for those sites which were "illegal" and in plain view of the trail.

Several combinations of rehabilitation techniques were tried. The use of "No Camping" signs was most effective in reducing site size. The placement of natural barriers on campsites and along access trails appeared to be an effective method of discouraging use, but natural barriers had to be reestablished several times due to their removal by campers. The technique of loosening soil was not documented well enough to evaluate its effectiveness.

Other Impacted Campsite Management Techniques

A brief review of current literature on the subject of backcountry campsite rehabilitation suggests the following:

The temporary closure of campsites as part of a rest-rotation system is unlikely to succeed because of the extremely slow recovery time of impacted sites.

The use of fertilizer to accelerate revegetation is not recommended. Fertilizer seldom improves revegetation success and tends to favor exotic species, while increasing the risk of eutrophication of nearby waters.

Revegetation by transplanting can be successful, but is time consuming and can disturb adjacent areas from which plants are removed. Another option with a greater rate of Success is transporting to the backcountry the cuttings of native plants grown in a nursery for transplanting.

Another revegetation option is site seeding with the seeds of native plants adapted to the site. The process is complicated by the special needs of gathering, storing, and matching any special germination requirements of the seed.

Future Actions

A. Formalize designated backcountry campsite selection criteria and management guidelines. Select designated backcountry campsites in areas where it is deemed necessary.

B. Based on the most recent impacted backcountry campsite inventory, identify the priority areas where backcountry campsite rehabilitation is needed.

9.4 Sanitation and Public Health

Human Waste

Backcountry users are expected to practice good sanitary habits and comply with the provision of *36 CFR 7.15 d (2), Sanitation, which states: "Except in comfort facilities provided therefore, no person in the backcountry shall urinate or defecate within ten (10) yards of any stream, trail, unpaved road or park facility. Fecal material must be placed in a hole and covered with not less than three (3) inches of soil." Pit toilets at designated campsites may be needed in the future. (*NOTE: Sanitation regulations will be revised as SNP Special Regulations, 36 CFR 7.15, are removed to the Park Compendium upon approval of proposed backcountry use regulations.)

Food Storage

The opportunity to view wildlife in their natural state is a major attractant to national parks. Wildlife, however, are easily conditioned to not only accept, but to seek out visitors' foodstuffs as a supplement to their regular diet. Once this becomes a practice, animals become habituated to humans and dependent upon unnatural and often harmful food supplies. To prevent this from happening, strict food storage regulations are in effect. Backcountry users must comply with the provision of 36 CFR 2.10 (d), Camping and food storage, which states in part: "The superintendent may designate all or a portion of a park area where food must be....suspended at least 10 feet above the ground and 4 feet horizontally from a post, tree trunk, or other object." This not only discourages bears but many other species of wildlife that are attracted to human foods as well.

Toilets

Primitive toilet facilities are found adjacent to PATC-operated huts and cabins and are reserved for those people using the huts or renting the cabins. As discussed in chapter 9.3, pit toilets will be installed at high-use designated campsites.

Trash and Garbage

Backcountry users are required to pack out all refuse and garbage. 36 CFR 2.14 (a) (1) states, "Disposing of refuse in other than refuse receptacles is prohibited." Garbage cans will only be provided at trailheads where it is deemed necessary.

Water Ouality and Public Health

A chlorinated water system is provided at Byrds Nest 3, and is maintained on a regular basis. This is a closed system with pipelines, valves, and faucets, and is sampled for water quality on a regular basis.

Untreated water sources are found throughout the backcountry. There are numerous open springs that are not treated or sampled on a regular basis. Any of these sources that are signed have a one minute boil warning on the sign. Only water sources found in the Threshold opportunity class, in the AT opportunity class along the AT footpath, or adjacent to PATC cabins will be signed. Water sources should only be signed if water is coming out a pipe (unclosed system) or is the main water supply around a cabin, hut, or shelter.

Under current regulations (1997), backcountry campsites must be located at least 25 feet from any stream (36 CFR 7.15 (b) (3) (v)). Furthermore, campers are required to exercise care and caution to prevent contamination of any water source due to sewage, wastewater disposal, horse and pack animal use, dishwashing, bathing, etc. according to 36 CFR 2.14 (a) (6) Sanitation and refuse. Several water-borne diseases including Giardiasis and Camplylobacter are presumably present in untreated park water sources. Backcountry users should be encouraged to treat all unprotected surface water by boiling it vigorously for one minute or by filtering it with a device which filters these micro-organisms. If these precautions are ignored, the chances for gastro-intestinal distress of varying severity is greatly increased.

Future Actions

A. As designated campsites are established, pit toilets must be installed at high-use sites and all designated site areas must be monitored for excessive human waste buildup.

B. Monitor fecal counts in water sources located near heavily used backcountry campsites or day use areas.

C. Evaluate the need for the water system at Byrds Nest #3 shelter; eliminate the system if appropriate.

CHAPTER 10
RESEARCH AND MONITORING

10.1 Backcountry Campsite Impact Inventory and Monitoring

The monitoring program incorporated in this plan addresses visitor use, one of many challenges to preserving natural environments. Though a central purpose for the creation and management of parks, visitation inevitably affects the natural and cultural resources of parks. This is particularly true at overnight campsites and day-use recreation sites, where visitation and its effects are concentrated. Potential consequences of visitation include the trampling and subsequent loss of ground vegetation, shrubs, tree seedlings, and felling of saplings; erosion of surface litter and humus; exposure, erosion, and compaction of mineral soil; and exposure of tree roots and damage to tree trunks (see Table 10.1) (Cole 1982, Marion 1984, Cole and Marion 1988). Disturbance of cultural resources by visitors has also been documented at SNP.

The NPS recognizes the need for effective visitor management and resource protection programs to balance visitation with its associated resource impacts. The recurring question, "are we loving our parks to death?" increasingly challenges managers to develop and implement management policies, strategies, and actions that permit the recreational use of 'parks without compromising their ecological and aesthetic integrity. Furthermore, managers are frequently forced to engage in this balancing act under the close scrutiny of the public, competing interest groups, and the courts.

As with other prominent and critical resource issues, managers can no longer afford a wait-and-see attitude or rely on subjective impressions of deterioration in resource conditions. Managers require scientifically valid research and monitoring data. Such data should describe the nature and severity of resource impacts and the relationships of controlling visitor use and biophysical factors. Research has revealed that these relationships are complex and not always intuitively obvious. A reliable information base is therefore essential to managers seeking to develop and implement effective visitor and resource management programs.

Table 10.1. Resource impacts caused by camping activities.

Vegetation Changes	Soil Changes	Additional Concerns
• Loss of Vegetation Cover • Alteration of Composition • Loss of Species • Damage to Trees • Exposure of Tree Roots • Loss of Tree Regeneration	• Loss of Organic Matter • Erosion • Compaction • Reduction in Soil Moisture	• Littering • Threats to Water Quality • Threats to Human Health • Threats to Wildlife • Threats to Cultural Resources

This plan calls for the application of the NPS visitor impact monitoring procedural manual (Marion 1991) to the development and implementation of a backcountry campsite inventory and impact monitoring program for SNP. The inventory and monitoring procedures outlined in the

manual were implemented at SNP in 1992, with the inventory completed in mid-1993. Legislative, administrative, and park resource protection mandates and objectives provide justification for this program and are documented elsewhere in this plan.

Although there are numerous reasons for developing a backcountry impact inventory and monitoring program, the actual value of these programs is entirely dependent upon the park managers who initiate and manage them. Programs developed with little regard to data quality assurance or operated in isolation from resource protection decision making will be short-lived. In contrast, programs that provide managers with reliable information that is necessary to develop and evaluate resource protection policies, strategies, and actions can be of significant value. Only through the implementation of objective management frameworks which integrate defensible monitoring programs can we hope to provide legitimate answers to the question, "are we loving our parks to death?"

Management Policies and Guidelines

Authority for implementing congressional laws is delegated to agencies, which identify and interpret all relevant laws and formulate management policies to guide their implementation For the NPS, these policies are set forth in the Management Policies.

Several statements in the Management Policies specifically require resource inventory and visitor impact monitoring:

> The National Park Service will assemble baseline inventory data describing the natural resources under its stewardship and will monitor those resources at regular intervals to detect or predict changes. The resulting information will be analyzed to detect changes that may require intervention and to provide reference points for comparison with other, more [human-]altered environments. (Chapter 4:4)

> Backcountry use will be managed to avoid unacceptable impacts on park resources or adverse effects on visitor enjoyment of appropriate recreational experiences. The National Park Service will identify acceptable limits of impacts, monitor backcountry use levels and resource conditions, and take prompt corrective action when unacceptable impacts occur. (Chapter 8:3)

> In every park containing wilderness, the conditions and long-term trends of wilderness resources will be monitored to identify needs for, and results of, management actions . . . every wilderness monitoring program will not only assess physical and biological resources, but also identify what impacts people have on resources and values and what impacts they have on other people using the wilderness. (Chapter 6:5)

> Potential impacts on soil resources will be routinely monitored. (Chapter 4:20)

Resource inventory and monitoring are also recommended for parks that have restricted visitor use:

> Any restrictions on recreational use will be limited to the minimum necessary to protect park resources and values and to promote visitor safety and enjoyment. To the extent practicable, public use limits established by the National Park Service will be based on the results of scientific research and other available support data. (Chapter 8:2)

Two NPS natural resource management guidelines, NPS-75, the Guidelines for Natural Resources Inventorying and Monitoring (USDI 1992), and NPS-77, Natural Resources Management Guideline (USDI 1991), also have relevance to visitor impact monitoring. NPS-75 states:

> It is the policy of the National Park Service to assemble baseline inventory data describing the natural resources under its stewardship, and to monitor those resources forever; to detect or predict changes that may require intervention . . . and with growing awareness of the effects of human activities within the parks, natural resource baseline inventories and subsequent monitoring are an essential basis for park management. (Chapter 1: 1)

NPS-77 also addresses resource inventory and monitoring programs:

> To fulfill the NPS mission of conserving parks, it is essential that park managers know the nature and condition of the resources in their stewardship, have the means to detect and document changes in those resources, and understand the forces driving the changes. (Chapter 5:20)

Superintendents are responsible for developing and implementing backcountry recreational use programs in parks (noted in chapter 3). Restrictions on visitor use are to be the minimum necessary:

> Any restrictions on use should directly relate to the accomplishment of specific management objectives identified in the plan, or resolve specific, documented impacts. (Chapter 3:73)

This plan has adopted a planning/management framework combining aspects of the LAC (Stankey et al., 1985) and VIM (Graefe, Kuss, and Vaske, 1990) approaches (see chapter 4). A backcountry campsite monitoring program is an essential element for these planning and management frameworks. As noted earlier, the NPS Management Policies requires using approaches that identify and monitor acceptable limits of change in backcountry settings.

Under the LAC and VIM frameworks, numerical standards can be set for individual impact parameters to specify the limits of acceptable change. These limits define the critical boundary line between acceptable and unacceptable conditions, establishing a measurable reference point to which future conditions can be compared. A visitor impact monitoring program provides the information that is needed by managers to formulate realistic standards and to periodically assess and evaluate resource conditions in relation to these standards.

Visitor Perceptions of Impacts

Visitor perceptions of recreational impacts are yet another justification for management concern regarding the acceptability of resource impacts. Results from visitor impact perception research indicate that visitors to wildland environments are indeed aware of recreational impacts (Lucas 1979, Marion and Lime 1986). In general, visitors are more sensitive to direct impacts of other visitors (such as the occurrence of litter, horse manure, malicious damage to vegetation) and particularly obtrusive examples of tree root exposure and soil erosion. A recent survey of visitors to three eastern wilderness areas found that littering and human damage to campsite trees were among the most highly rated indicators affecting the quality of wilderness experiences (Roggenbuck 1992). These and other resource impact indicators, such as the amount of vegetation loss and bare ground around a campsite, were rated above many social indicators, including the number of people seen while hiking and encounters with other groups at campsites. Additional studies of this type can supply valuable input to managers in the selection of appropriate impact monitoring indicators.

History of Campsite Monitoring at SNP

A trail inventory conducted within the Front Royal Sub-District in 1979 is the first recorded effort to monitor visitor impacts in Shenandoah National Park. The inventory included tallies of campsites and used areas, and items such as fire rings, litter, and tree cutting.

All backcountry campsites were evaluated from 1981-83 as part of a baseline campsite inventory and rehabilitation effort (Marion and Haskell, 1988). This survey included two impact parameters, site size and degree of erosion, and several inventory parameters such as site distance from water and the trail, vegetation type, elevation, slope, and developments. The survey was designed to inventory sites and to test practical methods for rehabilitating sites, not as a long-term monitoring system.

In 1989, South District staff inventoried 50 impacted campsites in the Riprap area using protocol developed by Cole for the U. S. Forest Service. The sites were rated and the most impacted sites were rehabilitated.

Research work by Marion in 1990-91 in the South District of SNP evaluated the accuracy and precision of alternative campsite monitoring procedures through field trials with park backcountry staff. This work provided the basis for some of the recommendations in the servicewide visitor impact monitoring manual (Marion 1991).

In 1992, a parkwide backcountry campsite monitoring program (chapter 9) was initiated and sponsored by the Mid-Atlantic Region Science Program. The inventory was completed in mid-summer 1993. Data from the inventory was available for analysis and has been used to develop standards and shape new strategies for backcountry management at SNP in this plan.

Monitoring Program Development, Objectives and Capabilities

Monitoring Program Development (1992)

Development of the campsite monitoring program initiated in 1992 was sponsored by the Mid-Atlantic Region Science Program under Cooperative Agreement 4000-9-8014, Supplemental Agreement Number 24. The development of the monitoring program was part of a larger research study designed to evaluate alternative backcountry camping impact management strategies. It is hoped that in the future, campsite monitoring data from Shenandoah and Great Smoky Mountains National Parks will be compared to evaluate three strategies: **dispersed camping** and **area closures** to camping as practiced at SNP, and **designated site camping** as practiced at Great Smoky Mountains National Park.

Monitoring Program Objectives

The overall objective of the backcountry campsite impact monitoring program is to provide park decision makers with reliable yet cost-effective data on the condition of campsites over time. Specifically, the monitoring program seeks to:

1. Obtain quantifiable measurements for managerially relevant campsite impact parameters using scientifically valid procedures.

2. Provide current and reliable information for resource protection decision making, including data analysis capabilities providing input to visitor impact management frameworks based on indicators and standards.

3. Maintain flexibility in the design and application of 'monitoring procedures to accommodate changing management needs and constraints.

4. Emphasize data accuracy and precision through the development and documentation of standardized monitoring procedures, quality assurance protocols, and field staff training programs.

Monitoring Program Capabilities

Effective management of visitor impacts requires objective and current information from inventory, monitoring, and research efforts. Management informational needs include documentation of where impacts are occurring, the types and severity of impacts, how impacts relate to amount and type of visitor use, how impacts relate to influential biophysical factors, and the effectiveness of management strategies and actions implemented to minimize resource impacts.

Scientists and managers have developed numerous impact monitoring systems to document and evaluate resource impacts resulting from visitor use. These management-oriented monitoring programs provide a standard approach for collecting and analyzing site-specific information on the nature and severity of visitor impacts over time (Table 10.2).

Table 10.2. Capabilities of visitor impact monitoring systems.

Monitoring Capabilities
• Identify and quantify site-specific resource impacts.
• Summarize impacts by environmental or use-related factors to detect and evaluate relationships.
• Aid in setting and monitoring management standards for resource conditions.
• Evaluate deterioration in resource conditions to suggest potential causes and effective management actions.
• Evaluate the effectiveness of resource protection measures.
• Identify and assign priorities to maintenance needs.

When implemented properly and with periodic reassessments, these programs can produce a data base that has significant benefits for the park manager, A monitoring program provides an objective record of changes occurring in visitor areas, even though individual managers may come and go. A monitoring program can help in detecting and evaluating trends by comparing data from present and past impact assessments. Deteriorating conditions can be detected before severe or irreversible impacts occur, allowing time to implement corrective actions. Relationships between specific impacts and use-related or biophysical information may suggest appropriate management actions. A monitoring program also helps in evaluating the success or failure of resource protection measures.

This plan seeks to formalize the implementation of a backcountry campsite impact monitoring program for SNP. It is recognized that long term monitoring of backcountry conditions is integral to the plan's success. The selection of physical or social indicators and the formulation of standards can not be justified or defended if existing and changing backcountry conditions are not documented and monitored. It is also recognized that there are many forces in public agencies which act against the continuance of long-term resource monitoring programs, such as changes in park personnel and priorities. It is recommended that this monitoring program be incorporated into the park's base operation in a manner similar to the Long Term Ecological Monitoring System (LTEMS) to help to ensure long-term support.

A comprehensive campsite impact monitoring manual, specific to SNP, has been developed as part of the campsite monitoring (Marion, 1993). This manual provides comprehensive documentation for the operation of the campsite monitoring program, including information on the following topics: personnel responsibilities and needs, budget estimates, recommendations for monitoring frequency, and descriptions of field forms, assessment procedures, database management, data analysis, and report production.

The value and longevity of the campsite impact monitoring program will be dependent largely upon its integration with and responsiveness to park management and decision making. A failure to cultivate and maintain organizational support will ultimately lead to its termination or result in a program that is operated in isolation by a particular district or unit. Achieving and maintaining a broad base of support for the monitoring effort should be a primary objective'for those involved with managing the monitoring program.

Future Actions

A. Implement a long term backcountry campsite monitoring program at SNP. This would include identifying personnel responsible and budget needs for field implementation and data management.

B. Identify and establish backcountry management personnel responsible for overseeing monitoring programs, analyzing data for comparison with established indicators and standards, and recommending management actions when standards are approached or exceeded.

C. Options are designated campsites or area closure to camping where significant cultural resources are being impacted.

10.2 Backcountry Trail Impact Inventory and Monitoring

During the 1970s the only trail conditions which were formally monitored were the blue blazed trails maintained by **PATC** trail overseers. These trails were inspected annually by SNP rangers using PATC's inspection form. The AT and other high visitor use trails throughout the park were maintained by regular NPS trail crews who informally monitored the trails and planned the year's work in the spring during the first walk through. A group of narrow grade, low use, yellow blazed foot trails referred to as "fire foot trails" were informally monitored and maintained on a as-time-permitted basis by the backcountry rangers.

In 1979 and 1980 two events occurred which prompted a major reorganization of trails maintenance responsibilities at SNP. There was an initiative along the entire AT to return all routine trail maintenance of the AT to local trail clubs. This occurred at a time when SNP's trail crew budget was severely cut. SNP and PATC responded to these changes and worked out an agreement which generally guides trail designations and trail maintenance responsibilities today. PATC is responsible for general trail maintenance on the AT and the majority of other foot trails (blue-blazed trails) and SNP trail crews are responsible for maintenance on horse/foot trails (yellow-blazed trails) and are available to assist PATC with technical or special trail maintenance needs.

Since 1980 the backcountry rangers have been responsible for monitoring backcountry trail conditions throughout the park. This had typically been done by documenting trail conditions on a "Trail Inspection/Condition Report" (Form SNP-259) annually, or more often if needed and forwarding the report to the trail overseer. These reports or a version of them are still in use today. These monitoring reports are non-technical in nature and are intended to give trail

managers and maintainers a brief overview of trail conditions to identify problems and aid in planning future work trips. The trail inspection report documents several items:

- Blazing (condition, appropriate number?),
- Signs (repairs needed, recommended changes),
- Obstacles (fallen trees, etc. causing hikers to be diverted),
- Vegetation (trimming needed),
- Erosion/water control (tread loss, perennial wetness),
- Tread problems (other than water),
- Other concerns (short cutting, litter, vandalism, etc.),
- Level of maintenance needed to correct problems noted,
- Trail access problems.

From 1983 to the early 1990s backcountry rangers summarized trail condition information and into an annual "State of the Trails" report which was presented at annual meetings of PATC and SNP trail managers. The State of the Trails report included details to serve as a guide from which annual trail work plans were developed at the district level. Trail condition monitoring at SNP has historically been non-technical and rather subjective from year to year depending on the trail maintenance experience of the trail inspectors. Trail condition monitoring at SNP focuses on identifying and prioritizing trail maintenance needs of the park with the highest priority always being those trails with obvious occurring resource damage or public safety concerns.

The most detailed monitoring project of SNP trails took place in 1986, when an interdivisional Maintenance and Resource Protection and Visitor Management (RP&VM) division survey was made of all the trails in the park. In this survey teams used a measuring wheel, a clinometer 'and a surveyor's notebook to record the location of all existing trail features (waterbars, etc.) and needed trail work to the nearest foot, as well as percent slope of tread and percent side slope. This information was used in 1987 to administer a more than $600,000 trails rehabilitation contract to restore trails damaged by flooding in November 1985.

In 1998, Park management assigned monitoring, management of the SNP trail system, and supervision of the NPS trail crews to the Division of Natural and Cultural Resources (NCR) to more efficiently coordinate management and maintenance of the SNP trail system. These responsibilities are now those of the parkwide Trails Coordinator, District Trail Crew Supervisors, and the Backcountry and Wilderness Manager.

Storm Damage Assessment to Trails

In addition to routine monitoring of trail conditions, the Division of NCR coordinates special trail condition monitoring projects documenting the effects of natural disasters such as floods, hurricanes, and ice storms on the trails. This documentation is then used to coordinate non-routine trail maintenance projects, or to apply for special disaster relief funding.

Although backcountry trail condition monitoring at SNP is mainly focused on identifying and

prioritizing district and parkwide trail maintenance needs by the most efficient means, the system readily identifies occurring resource damage and public safety concerns. The monitoring data gathered for the routine annual reports is subjective in nature and not quantitative. Quantitative monitoring data is sometimes gathered on SNP trails when needed to document major resource damage related to a natural disaster. Such data is much more expensive to gather and requires additional staffing than is normally programmed the park's backcountry management operation.

Future Actions

A. Develop a more consistent and quantitative method for monitoring and inspecting trail conditions at SNP.

10.3 Natural Resource Inventory and Monitoring

SNP began the development of natural resource monitoring programs in the early 1980s with special emphases on air quality, water quality, fish and black bears. In 1991 the park was selected as a prototype inventory and monitoring program for the NPS which allowed the park to hire monitoring specialists and expand programs for other resources of concern. An overview of the monitoring program development is found in the Natural Resource Inventorv and Long-Term Monitoring; System Plan for Shenandoah National Park (1991). The records, data and analyses of the inventories and monitoring projects is maintained by the staff of the Division of Natural and Cultural Resources.

The goal of this program is to identify and measure changes in the components of the natural systems that represent SNP. In most cases, the program will be establishing baseline data for resources for the first time since the park was established. This information will be made available for management decision making, resource protection, education of park staff and the public, and scientists interested in specific resource questions. Direct human impacts on resources will be identifiable in some resource datasets. Resource conditions and changes in the resources can be compared to the results of backcountry use monitoring and appropriate responses for protection of resources or environmental processes can be developed. In some cases recommendations for restoration with subsequent monitoring will result. This monitoring system will be ongoing and will continue to adapt to changes in the resources and the needs of SNP managers.

10.4 Social Inventory and Monitoring

The NPS is endeavoring to enhance the social science component of park and servicewide resource management programs. This goal is yet to be reached. In the interim this Park shall approach social science issues on an as needed basis. In 1992 a park ad hoc committee on social science issues has identified several topics that relate to backcountry use:

1. Visitor perception of backcountry and its use,
2. A long-term monitoring of backcountry user and their impacts,

3. Park neighbors' perceptions of park values, and
4. Backcountry accessibility for an aging population.

As the social science component of the resource management program develops, its application to the needs of backcountry management will be recognized and applied.

Future Actions

A. Conduct a social science survey of backcountry visitors to: 1) identify appropriate social indicators and their current range of conditions within the recreational opportunity classes defined by this plan, 2) describe their perceptions of existing trail and campsite conditions, 3) describe their perceptions of existing and planned camping regulations, and 4) develop an efficient monitoring program for social science indicators. An Old Rag social science survey may be conducted separately and prior to the parkwide survey due to critical management issues at that location,

B. Develop standards for social science indicators and implement a routine monitoring program.

10.5 Data Collection and Management

The data collected in the various items monitored in the course of this plan shall be reduced to a digital format and archived in the Division of Natural and Cultural Resources (NCR).

Future Actions

A. Develop a system for collecting and archiving collected backcountry monitoring data with the NCR.

CHAPTER 11
INTERPRETATION AND EDUCATION

11.1 "Minimum-Impact" Backcountry Use Education

Providing effective education and information to backcountry and wilderness users is an essential lighthanded management strategy that permits freedom, exploration, and spontaneity to the backcountry user. Informing backcountry users is typically viewed as unobtrusive and non-authoritarian. With effective education and information the backcountry visitor retains freedom of choice; they can choose to respond or not to respond. With this approach the manager becomes a helpful guide rather than one who restricts or regulates. Research has consistently shown that a majority of backcountry users want information.

Most experts believe that the majority of unacceptable visitor impacts in backcountry or wilderness settings are nonmalicious acts. These unintentional acts are carried out by the uninformed, unskilled, and careless backcountry user. Persuasive and well directed information can be highly effective in reducing environmental impacts, visitor conflicts, and problem behaviors.

The key to providing effective education and information to backcountry users is to (1) identify the target audiences to be reached, (2) present information to the target audiences at places where they will receive it, (3) provide information in a timely manner (before the user enters the backcountry), (4) provide messages which are relevant, credible, sequential, and concise, and (5) select the most effective media to channel the information within the given circumstances or constraints. Continued evaluation and adjustment of each element of this process must be on-going for this educational approach to be effective.

Identifying our backcountry user audiences is essential. Taking the shotgun approach is inefficient and ineffective. We must identify those groups which use and impact the backcountry resource most, like boy scout and youth groups, first-time backcountry users, and day-hikers. We need to provide these target audiences with target messages as far in advance of their entering the backcountry as possible, so that they can make informed decisions about their trip plans and be knowledgeable enough to behave in a minimum-impact manner.

Just issuing permits to trip leaders and reviewing the rules and regulations is not enough. With thoughtful strategies involving minimum-impact information we can help people attain the experiences they seek, ayoid disappointments from expectations not met, and separate user groups seeking to participate in conflicting and incompatible activities. Information and education can be used to direct potential wilderness users seeking experiences not dependent on wilderness to more appropriate areas within the backcountry. Informing visitors of heavily and lightly used zones and times within the backcountry can better redistribute use throughout the area or through time, and provide increased opportunities of solitude. Educating actual or potential backcountry users on minimum-impact hiking and camping can increase knowledge and skill levels, change behavior, and reduce site impact.

The NPS and other federal land management agencies have adopted the "Leave No Trace" (LNT) outdoor skills and ethics education program developed by the National Outdoor Leadership School (NOLS) in Lander, Wyoming. This is a national educational program whose mission is to educate wildland user groups, federal agencies, and the public about minimum-impact camping and hiking. The program is not meant to provide a set of rules and regulations, but is intended as principles and practices which help the backcountry/wilderness user to make better decisions "based on an abiding respect for and appreciation of wild places and their inhabitants. " NOLS provides the LNT Skills and Ethics Series of educational booklets which are directed to LNT practices for specific geographical regions of the country. The LNT Southeastern States booklet is that which provides recommended LNT practices for the region including SNP. Also, the NOLS publication, Soft Paths, offered for sale at SNP visitor centers by the Shenandoah Natural History Association (SNHA), is an excellent guide to responsible ethics and behavior in outdoor recreation.

Research indicates that the most effective media of communicating information to backcountry users is oral or face-to-face communication. Written brochures can be effective, particularly in combination with personal contact. Short educational slide presentations or videos have proven to be effective, as well as some "user-friendly" microcomputer aids. Communication through television, radio, and newspapers has been shown to be ineffective for reaching the backcountry user.

Based on this information the following strategies have been developed to reduce backcountry user impacts on SNP's backcountry.

Education and Information Strategies

A. Personal Contact Strategies

1. Provide LNT training. in park backcountry recreation management to park and concessioner employees so that effective "face-to-face" communication with visitors to educate them on minimum-impact techniques is assured. This training is of particular importance for those employees responsible for issuance of backcountry camping permits. The park needs to continue to provide opportunities for some employees to achieve training as "LNT Masters" to further train other employees and targeted user groups. In cooperations with NOLS, the park may also provide in-park LNT Master training courses to include trainees from park cooperators, user groups, other NPS areas, and other land management agencies.

2. Develop a workshop on LNT camping that can be presented to target audiences prior to their backcountry visit. Audiences could include any appropriate groups such as scouts and other youth groups and their leaders. Workshops can be conducted on and off site during the shoulder seasons.

B. Written Information Strategies

1. Rewrite the current backcountry brochure. Emphasis will be placed on wilderness ethics and SNP backcountry management, as well as the latest minimum-impact camping techniques. Distribution will be widespread at visitor centers, entrance stations, ranger stations, and through park mailings and all the listed personal contact strategies.

2. Site bulletins and maps will be developed. Distribution of this material will be somewhat limited. It will be available at the trailheads either through personal contact or dispenser. The appropriate site bulletin will be provided to backcountry campers inquiring or obtaining a backcountry camping permit for a designated campsite area.

C. Multimedia Strategies

1. Develop a 10 to 12 minute video on minimum-impact camping in SNP. The target audience will be unskilled, first-time SNP backcountry campers and perhaps any first-time visitors to the backcountry. It will be part of the backcountry overnight camping permit program to help educate first-time users upon permit issuance. The video might be available for sale by SNHA, the park concessioner, and area outfitters. The video will also be available for loan to organized groups like Boy Scouts and church groups. The video will be shown at backcountry workshops and training courses. It may be shown by outfitters in their stores, at off-site programs, and at the visitor centers as desired. Such organizations as PATC and NOLS might contribute to accomplishment of this task.

Future Actions

A. Personal Contact Strategies:

1. Establish a backcountry user information hotline. This phone line would be available to potential backcountry users during park business hours. It would be answered, during the height of the backcountry season, by a limited number of rangers who are well informed on backcountry concerns in order to provide consistent and accurate information. A recorded information message would be provided to callers after hours and allow callers to leave a message for a return call or mail information request.

2. Increase backcountry user contacts with rangers at busy trailheads and on trails. Though law enforcement backcountry patrols are important in detecting and monitoring visitor impacts, they may have limited effect in influencing visitor behavior as damage may be done by the time a ranger contact is made. Contacting visitors at the trailhead or on the trail, at optimum times of the day, can prevent resource and social impacts by reaching and educating the uninformed and unskilled backcountry user before they have had a chance to damage the resource and degrade the experience of other visitors.

3. An optional backcountry certification workshop or course will be conducted regularly or as a scheduled interpretive activity. Participants will be certified as a park LNT camper and upon course completion issued a card which certifies the user's knowledge of park backcountry management principles. The only requirement for future backcountry use will be for the permit holder to file a trip itinerary and possess their

permit card each time they use the backcountry.

4. Interpretive programs will be conducted in each district throughout the core visitor season. Programs would include minimum-impact camping and what to do if lost in the woods. Target audiences will be day users and unskilled first-time backcountry users.

B. Written Information Strategies:

1. A backcountry newsletter will be printed annually and sent to all persons who were issued a backcountry permit for the previous year. The target audience is, of course, repeat users of the park's backcountry. Emphasis of the newsletter will be on backcountry management concerns, updates on policies and regulations, and suggested alternative hikes to lessen impacts on heavily used areas.

C. Multimedia Strategies:

1. Develop a "user-friendly" computer program using touch screen exhibits and information systems to dispense information about the backcountry in a sequential decision-making format. Touch screen exhibits will be placed at each visitor center and programmed in a decision-tree format. The format will allow the user to use their own decision-making criteria in their own preferred sequence. The program can be used by all target audiences, because they could select the information that would be most useful or beneficial to them. The exhibit can be programmed to offer instruction in LNT camping techniques or help someone choose a trail that meets their personal desires and experience level.

2. Create a video program which can be used at backcountry camping permit issuing stations to educate backcountry users on LNT camping techniques. This program can also be provided to outside organizations and local outfitters.

EVALUATION OF EDUCATION AND INFORMATION STRATEGIES

1. In cooperation with Virginia Tech and other interested institutions, conduct social science surveys on each strategy implemented to evaluate its relative effectiveness. Make adjustment and improvements to the strategies as needed.

2. Interpretation efforts will use focus groups as an evaluation tool to assess the effectiveness of such strategies as the minimum-impact camping video, interpretive presentations, workshops on minimum-impact camping, and the computer touch screen exhibit. Evaluating by focus groups is a structured group discussion by park visitors on specific interpretive programs or information services. Focus groups reveal visitor's attitudes toward and perceptions of the interpretive program or information service. The results of the evaluation will be a written summary of visitor's verbal responses to questions about these services. Interpreters will follow the guidelines as set forth in the training package prepared for the NPS entitled, "Focus Groups: A Tool for Evaluating Interpretive Services."

CHAPTER 12
BACKCOUNTRY CAMPING PERMIT SYSTEM

12.1 System and Administration

SNP backcountry is used primarily by day hikers for a variety of activities. Backcountry day use has substantial direct impact on trails and at attraction sites, but overnight camping activities have much greater potential for resource and social impacts off-trail. Overnight campers differ from day users in their expectations of the backcountry experience which involves additional skill, challenge, and risk in the outdoor environment. Backcountry camping activities need to be managed to reduce impacts and additional service and information needs to be provided to visitors. A mandatory backcountry camping permit system is a management action selected as an important program in meeting the objectives of the BWMP. The system is designed to meet the following objectives:

1. Educate and inform overnight visitors on camping regulations and practices to minimize their impacts on the backcountry resource .

2. Direct overnight visitors to backcountry areas where they can best meet their interests as well as where they cause the least impact.

3. Provide customer service by informing overnight visitors of backcountry conditions, anticipated weather conditions, and safety information.

4. Provide customer service by acknowledging the visitor's presence in the backcountry so that any needed emergency response by park staff is enhanced.

5. Provide assurance that the backcountry camper understands and acknowledges regulations and expected behavior in the backcountry, therefore enhancing the park staff's ability to enforce regulations designed to protect both the resource and the visitor's backcountry experience.

6. Provide a method of documenting overnight visitor use and campsite location statistics for analytical use. This documentation can be applied to decisions on management actions to reduce backcountry impacts.

To best meet these objectives, staffed backcountry camping permit issuance requiring face-to-face contact is the preferred strategy over self-registration permit issuance. The backcountry camping permit system should meet these objectives while providing for visitor convenience in obtaining the mandatory permit.

Backcountrv Camping Permit Issuing Stations

Historically, Park entrance fee collection stations have been responsible for a major share of issuing backcountry camping permits. However, visitor activity in and around these stations has

impacts on accountability and security in fee collection operations. Vehicle and visitor congestion at stations during peak visitor use periods further impacts fee operations, visitor and employee safety, visitor service, and the success of the permit system in resource protection. Experience in managing the SNP backcountry camping permit system indicates that issuing permits is most appropriately done at visitor centers or information stations designed and that are staffed for extensive visitor contact.

Any form of backcountry camping permit issuance at fee collection stations should be minimized, especially during peak visitation periods. It is anticipated that staffed permit issuing stations will be limited primarily to Dickey Ridge Visitor Center and Thornton Gap Inforation Station in the North District, Byrd Visitor Center in the Central District, and Loft Mountain Information Station in the South District. To expand the system of permit issuing stations (particularly outside of the park) might be counter-productive since some centralization is necessary for effectiveness in meeting some permit objectives and in anticipation of user fees and development of a computerized permit network and mandatory fee permit system. Strategies for issuing permits including support from cooperative volunteer organizations such as PATC, Sierra Club, Nordic Ski Patrol (north district), and others should be explored. A seasonally staffed information station has been established at the base (park boundary) of Old Rag Mountain in the Central District to provide visitor service and backcountry resource protection (see chapter 13).

Visitors may also currently obtain permits by mail or by telephone contact with any permit-issuing station or Park headquarters, but this is not encouraged due to some difficulty in this strategy to meet some permit objectives. In the future, mailing of permits might be performed by a centralized permit office to remove this workload and responsibility from the Park headquarters area. A centralized backcountry office would facilitate a computerized permit network and a backcountry campsite reservation/fee system as the need arises.

Self-registration backcountry camping permit stations can be the preferred alternative at some locations and times. Backcountry camping impacts during the winter months are substantially reduced from the rest of the year due to reduced park visitation in general, the tendency of winter backpackers to be more highly skilled in minimizing their impacts, and the seasonally dormant forest environment. Therefore, parkwide permit self-registration is appropriate outside of the backcountry use “core” season, from about mid-November through mid-March when park staffing is also at its minimum. All Park backcountry regulations continue to be enforced through this period. During this period the permit system will provide only rough visitation estimates for Park management and basic trails and regulation information to visitors. Permanent self-registration stations will also be provided at AT locations with the intent of providing service, information, and permit convenience to long-distance trail hikers entering the park. Otherwise, “after hours” permitting and any other backcountry camping permit self-registration must be severely limited. Park interpretive, publications and station signing must clearly state the backcountry camping permit requirement and the scheduled station hours during which permits can be obtained.

Backcountry camping permit self-registration should be closely monitored and minimized as

changes in backcountry conditions approach the standards set in the management objectives. Emphasis must be placed on management of backcountry conditions, not on management of a camping permit system.

Backcountry Site Bulletins/Maps

The visitor's backcountry opportunities and protection of the resource from human impact will be managed by the backcountry camping permit system based on five "opportunity classes" described for the park. The opportunity classes reflect a spectrum of visitor opportunities from "low use" to "high use" areas and management actions from "light-handed to "heavy-handed." For example, management actions can range from a dispersed camping strategy and infrequent ranger patrols to designated campsite reservations or strict area closures and routine ranger patrols. The opportunity classes have been mapped as zones in the BMP. Within the mapped zones, specific campsite management strategies, backcountry trail and campsite standards, and visitor opportunity for solitude are described for each opportunity class. This is a complex management and planning system in response to complex backcountry issues, but is made logical and simplified for visitors by use of backcountry site maps.

Backcountry site bulletin/map handouts will be the key to providing the visitor with trip planning and campsite information during issuance of a backcountry camping permit. The park backcountry has been sectioned into "sites" with identifying geographical names. Each site will have an 8.5" x 11" map which describes the opportunity class or classes within that site in terms of applicable camping regulations. The site map will include basic trail map information (not to the detail of district PATC trail maps) and specific campsite regulation information for each zone located within the site. The site map might include area closure information, appropriate safety messages, and other site-specific information. Each administrative district in the park will have several site maps for appropriate issuance with the backpacking permit. For example, a visitor traveling the Jeremys Run-Neighbor Mountain trail circuit in the North District and camping in Jeremys Run would be given a "Jeremys Run" site map. From map information, the visitor would be required to camp in any existing "established" campsite within the Jeremys Run trail area. Dispersal camping in the Neighbor Mountain zone, a low use area, would be permitted as described by that site map (see chapter 9 for details on campsite management). The site map strategy ensures that the visitor is properly informed even when the permit issuer is totally unfamiliar with the area the permit is being written for (a situation that will be minimized as possible). The backcountry camping permit would be written using "zone codes" instead of "trail codes." A generic site bulletin would be produced for the Primitive Wilderness and Primitive Non-wilderness opportunity classes throughout the Park and could relate to a variety of sites, reducing the number of site bulletins or maps needed parkwide.

Other Backcountry Camping Permit Issuance Strategies

To facilitate issuance of permits at established stations and the training of new permit writers, a videotaped or computer-aided program of about 10 minutes duration, describing Leave No Trace backcountry camping regulations and practices will be produced. Vandal- and weather-resistant informational displays will also be constructed for use at each of the stations. These displays should be constructed so that they can be easily converted to outdoor self-registration permit stations during the winter months. In addition to regulation information, these off-season

stations would provide permit self-registration procedures, permits, and a limited range of site map handouts for visitors. A presentation of camping opportunities could be displayed to assist visitors in trip planning. A "dichotomous key" (such as those used in field identification guides) illustrating a series of steps (decisions) would aid the visitor in determining where in the backcountry to camp according to individual preference and experience.

In the future, a certification system could be established which would enable repeat backpackers to obtain a permit without going through the trip planning and regulations discussion at a staffed registration station could be established. Certification in the form of a card could be issued to individuals who have attended and passed special certification courses. The card could be presented at the staffed registration station and a permit issued with only general data collection, safety, and site map information communicated. Such a system would reduce the time required in issuing the permit, therefore rewarding the "certified" visitor with not having to go through a familiar and perhaps unnecessary process. This system might be expensive to implement, but could be feasible with a computerized permitting system.

A backcountry reservations system for designated and group campsites may also be established in the future if needed and technologically feasible. This method of rationing use would be enhanced by a centralized backcountry office and a computerized permitting system. This system needs to be enforceable, which will be challenging with limited backcountry staffing levels.

Future Actions

A. Produce interpretive displays for backcountry camping permit stations (rotate use to self-registration stations during winter months).

B. Produce backcountry site bulletin/maps.

C. Emphasize face-to-face permit issuance contacts using strategies described in this section of the plan. Reduce availability of self-registration permits during peak visitor periods.

D. Establish "business hours" for backcountry camping permit issuance and publicize this information through brochures and entrance station signing. Do not issue permits outside of these hours and step up enforcement of the "required permit" regulation.

12.2 Backcountry Camping Permitting Procedures

A "Backcountry Camping Permit Handbook" will be available at each permit-issuing station The handbook includes information necessary for completing a backcountry camping permit and effectively communicating regulations to visitors. The handbook will be revised at least annually and should contain the following information:

1. Overview of backcountry camping permit purpose and issuance instructions,

2. Coding guide for backcountry camping permits,

3. Backcountry campsite codes,

4. Site bulletin/maps for campsite zones,

5. Description of backcountry rules and regulations,

6. Information on bears and food storage,

7. Park boundary access information for each district,

8. Horse use site bulletin/map information for each district,

9. Information on backcountry shelters, huts, and cabins,

10. Trail system inventory for each district, and

11. Description of water sources in each district; Giardia information.

All backcountry camping permit issuing stations must have a handbook available for use by those employees issuing permits. Employees must be familiar with the handbook and permitting procedures. It is recommended that these employees also have access to and read the BWMP to have a basic understanding of the SNP backcountry management philosophy, Leave No Trace backcountry use ethics, and management actions.

The permitting procedure consists of 6 basic steps:

1. Contact the visitor in a pleasant and professional manner.

2. Determine the visitor's interests, preparation for, and experience in backcountry camping at SNP.

3. Provide trip planning for the visitor as needed. The visitor might wish to consult and/or purchase a park map to plan the trip.

4. Inform the visitor of minimum impact camping practices and park backcountry regulations.

5. Inform the visitor of safety, weather, drinking water precautions, and other special backcountry conditions.

6. Complete the permit according to handbook instructions.

(See chapter 16.2 for **Future Actions)**

12.3 Backcountry Camping Permit Codes

Coding Guide For Backcountry Camping Permits

1. Name and Address section:

Enter the name and address of the person requesting the permit and/or the responsible group leader.

(Blocks 1 - 5)

Enter the visitor's home 5-digit zip code, if available.

2. Start and finish dates: (Blocks 9 - 17)

Give the month and day on which the backcountry trip will begin in the park (the first night in the backcountry).

Give the month and day on which the trip will end (the day of departure from the backcountry).

3. Location of entry/exit:

List (use place name) the trailhead or backcountry entry point, or where the car will be parked.

List (use place name) the trailhead or point of departure from the backcountry if different from above.

4. Number of people in group: (Blocks 26 - 27)

Enter the total number of people in the party up to 10.

Note: Backcountry regulations prohibit more than 10 persons in a camping party to help minimize camping impacts on the Park. Groups larger than 10 persons need to break up into smaller groups with each group on a separate permit and its own group leader. Groups are discouraged from hiking together and must camp at least 50 yards apart and preferably out of sight of one'another.

5. Campsite Name, Zone, Code, & Nights:

List each area the party will use for camping and the number of nights at each area. Camping is limited to 2 nights at a campsite to minimize impacts.

Camping area names will be either trail names or geographic locations. Backcountry campsite codes are listed alphabetically by district.

Campsite codes do not have to appear on the camper's copy of the permit, but need to be coded on the white copy.

If a camping party plans to stay at more than 10 different campsite areas, use one permit for the first 10 sites. Show start and finish dates for these 10 sites only. Use another permit for the remainder of trip. Clip the data copies together.

For continuity, when a camping party is spending a night off the trail in a developed area in the park (i.e., Loft Mt. Campground) show it on the permit, then code as follows:

199 - North District developed area
299 - Central District developed area
499 - South District developed area

6. Remarks:

In this area of the permit, but not necessarily in the "Remarks" block, enter the license tag(s) of the vehicle(s) in the party which will be parked at a trailhead(

Use this area of the permit to write comments such as, "Regs. Reviewed" or "Regs. Understood".

7. Signatures:

The visitor signs the permit to certify understanding of and agreement to abide by backcountry camping regulations.

The issuing employee signs and dates the permit, then gives the original permit to the visitor, instructing the visitor to display the permit on a pack while camping in the park backcountry. White and pink copies are routed to the district office, then on to park dispatch office.

For permits placed at self-registration stations, write: "Self-Reg. " and the station name (i.e., Self-Reg . , Rockfish).

8. Issuing Station: (Blocks 79 - 80)

Issuing station codes are listed by district and are used to track the backcountry permit workload at contact stations. See the attached codes.

9. Special Notes:

Four areas in the Central District have been designated as outstanding natural areas. Camping is not permitted within these areas to manage adverse impacts upon park resources

and are appropriately signed along the trails.

- Limberlost area, bounded by Limberlost Trail.
- Summit area of Hawksbill Mt.
- Whiteoak Canyon, between the first and fourth waterfalls.
- Summit area of Old Rag Mt., above 2800' contour.

Trails closed to pets: (excepting guide dogs and work dogs)

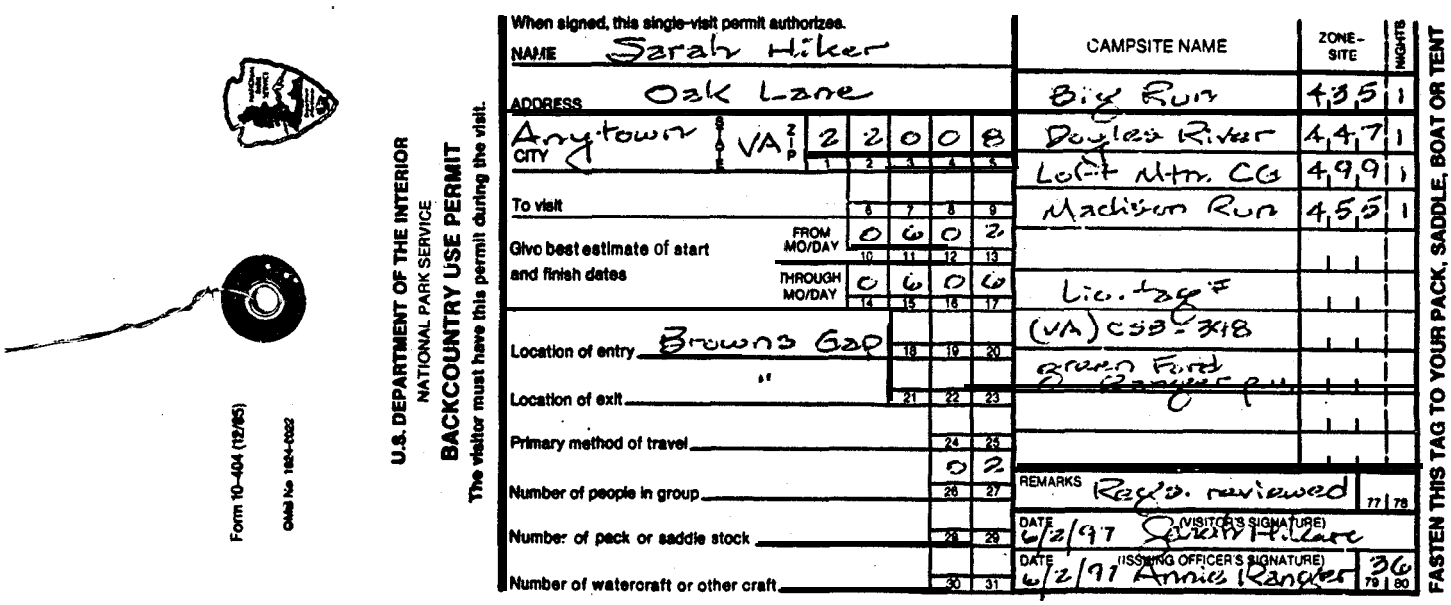
-- Nature Trails:
- Fox Hollow
- Traces
- Stony Man
- Story of the Forest (Big Meadows)
- Deadening (Loft Mt.)

-- Other trails closed to pets:
- Bearfence
- Dark Hollow Trail
- Old Rag Mt. (Ridge Trail and Saddle Trail)
- Limberlost

Figure 12.1

Sample

Backcountry Camping Permit



Form 10-404 (12/85)
OMB No. 1024-0022

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BACKCOUNTRY USE PERMIT
The visitor must have this permit during the visit.

When signed, this single-visit permit authorizes.

NAME Sarah Hiker
ADDRESS Oak Lane
CITY Anytown STATE VA ZIP 22008
To visit
Give best estimate of start and finish dates — FROM MO/DAY 06 02 — THROUGH MO/DAY 06 06
Location of entry Browns Gap
Location of exit "
Primary method of travel
Number of people in group 02
Number of pack or saddle stock
Number of watercraft or other craft

CAMPSITE NAME	ZONE-SITE	NIGHTS
Big Run	435	1
Doyles River	447	1
Loft Mtn. CG	499	1
Madison Run	455	1
Lic. tag # (VA) CSB-348		
Green Ford Ranger pu		

REMARKS Reg's. reviewed
DATE 6/2/97 (VISITOR'S SIGNATURE) Sarah Hiker
DATE 6/2/97 (ISSUING OFFICER'S SIGNATURE) Annie Ranger
36

FASTEN THIS TAG TO YOUR PACK, SADDLE, BOAT OR TENT

BACKCOUNTRY CAMPSITE CODES FOR APPALACHIAN TRAIL SECTIONS

NORTH DISTRICT	HUTS
AT boundary to Gravel Springs	101
AT Gravel Springs to Elkwallow	102 Gravel Springs
AT Elkwallow to Beahms Gap	103
AT Beahms Gap to 211	104 Pass Mt.

CENTRAL DISTRICT	
AT 2 11 to Pinnacles Picnic Area	201
AT Pinnacles Pic. Area to Hawksbill Gap	202
AT Hawksbill Gap to Lewis Spring	203 Rock Spring
AT Lewis Spring to Bearfence Mt. Hut	204
AT Bearfence Mt. Hut to Swift Run Gap	205 Bearfence Mt.

SOUTH DISTRICT	
AT Swift Run to Simmons Gap	401 Hightop
AT Simmons Gap to Loft Mt. Summit	402 Pinefield
AT Loft Mt. Summit to Doyle Riv. Ov.	403
AT Doyle Riv. Ov. to Blackrock Gap	404 Blackrock
AT Blackrock Gap to Jarman Gap	405
AT Jarman Gap to Rockfish Gap	406 Calf Mt. Shelter

MILES BETWEEN HUTS ALONG APPALACHIAN TRAIL (SOUTH TO NORTH)

Rockfish Gap (enter park)
7 <
Calf Mountain Shelter (406)
13 <
Blackrock (404)
13 <
Pinefield (402)
8 <
Hightop (401)

Hightop (401)
13 <
Bearfence (205)
11 <
Rock Spring (203)
15 <
Pass Mountain (104)
13 <
Gravel Spring (102)
8 <
Compton Gap (leave park)

NORTH DISTRICT CAMPSITE ZONES

101 AT (A) Boundary to Gravel Springs
102 AT (B) Gravel Spr. - Elkwallow Gap - (Gravel Springs hut)
103 AT (C) Elkwallow Gap - Beahm's Gap
104 AT (D) Beahm's Gap - Rt. 211 - (Pass Mt. Hut)
124 Beecher Ridge Trail
148 Beecher-Overall Connecting Trail
116 Big Devils Stairs Trail (to boundary)
115 Bluff Trail
118 Browntown Trail
142 Butterwood Branch
150 Compton Gap Trail
109 Compton Peak
105 Dickey Ridge Trail (north of DRVC)
120 Dickey Ridge Trail (south of DRVC)
129 Elkwallow Trail
134 Fork Mt. Trail
106 Fox Hollow Nature Trail (no pets)
107 Harmony Hollow
119 Harris Hollow Trail
125 Heiskell Hollow Trail
139 Hickerson Hollow Trail
138 Hull School Trail
110 Indian Run
111 Jenkins Gap Trail
128 Jeremy's Run Trail
117 Jordan River Trail
143 Kemp Hollow
130 Keyser Run Road
126 Knob Mt. Trail
153 Knob Mt. cut-off Trail
108 Lands Run Road
121 Little Devils Stairs Trail
145 Mathews Arm Trail
112 Mount Marshall Trail
127 Neighbor Mt. Trail (includes cut-off trail)
141 Oventop Mt.
123 Overall Run Trail
140 Pass Mt. Trail
155 Pass Mt. Road
137 Pignut Mt.
133 Piney Branch Trail (below Hull School Tr.)
132 Piney Branch Trail (above Hull School Tr.)
135 Piney Ridge Trail

131 Pole Bridge Link Trail
149 Rocky Branch Trail
144 Shenk Hollow
151 Snead Farm Loop Trail
154 Spring House Road
152 Sugarloaf Trail
113 The Peak
147 Thompson Hollow Trail
136 Thornton River Trail
114 Tuscarora-Overall Run Trail (formerly Big Blue-Overall Run)
122 Tuscarora Trail (formerly Big Blue)
146 Weddlewood Trail
199 North District developed area (ie. Mathew's Arm Campground, etc.)

CENTRAL DISTRICT CAMPSITE ZONES

201 AT (A) Rt. 211-Pinnacles Picnic Area
202 AT (B) Pinnacles-Hawksbill Gap
203 AT (C) Hawksbill Gap-Lewis Spr. - (Rock Spring Hut)
204 AT (D) Lewis Spr-Bearfence Mt
205 AT (E) Bearfence Mt-Swift Run - (Bearfence Hut)
344 Abrams Mountain
324 Bearchurch Rock
333 Bearfence Mountain (no pets)
213 Beech Spring Hollow
253 Berry Hollow
306 Big Fill Hollow
2 2 2 Blakey Ridge Rd.
330 Bootens Gap
229 Broad Hollow Trail
215 Buck Hollow
216 Buck Ridge
305 Buck Spring Area
332 Bush Mountain
322 Cat Knob
226 Catlett Mt.
227 Catlett Spur
222 Cave Falls
307 Cedar Run Trail 350 Cedar Run Link
291 Central District, Boundary East
292 Central District, Boundary West
299 Central Dist. Developed Area (i.e. Big Meadows Campground, etc.)
331 Conway River Fire Road
234 Corbin Cabin Cut-off
237 Corbin Hollow
238 Corbin Mountain
257 Crescent Rock
212 Crusher Ridge
342 Dean Mountain
261 Dove1 Mountain
345 Dry Run Falls Fire Rd.
206 Elder Ridge
309 Fishers Gap
321 Fork Mountain Fire Rd.
303 Franklin Cliffs
262 Grindstone Mountain
225 Hannah Run
301 Hawksbill Gap
353 Hawksbill Summit (no camping permitted)

308 Haywood Mt/Spitler Hill
220 Hazel Mountain
223 Hazel Mountain Trail
221 Hazel River Trail
351 Hensley Hollow
352 Hensley Ridge
230 Hot-Short Mountain Trail
235 Hughes River
260 Indian Run Trail
219 Jenkin's Hollow
211 Jewel1 Hollow
325 Jones Mountain Area
323 Jones Mountain Trail
245 Kettle Canyon
304 Kite Hollow
3 19 Laurel Prong
208 Leading Ridge
337 Lewis Mountain
336 Lewis Mt. East
335 Lewis Mt. West
314 Lewis Spring Area
249 Limberlost Trail (no pets; no camping permitted)
242 Little Stony Man
207 Marys Rock
209 Meadow Spring
317 Milam Gap
318 Mill Prong
246 Miller's Head
263 Naked Creed, East Branch
327 Naked Creek, West Branch
302 Naked Top
259 Negro Run
236 Nicholson Hollow
217 Old Hazel Trail
247 Old Rag Fire Road
232 Pine Hill Gap Trail
343 Piney Mountain
239 Pinnacle Peak
233 Pinnacles Ridge
338 Pocosin Area
339 Pocosin Fire Road
340 Pocosin Hollow
341 Pocosin Horse Trail
329 Powell Mountain Trail
251 Ragged Run

315 Rapidan Fire Road
326 Rapidan River
250 Ridge Trail (Old Rag Mt.) (no pets; no camping permitted on Old Rag summit above 2800 feet elevation)
241 Robertson Mountain Trail
231 Rocky Run
311 Rose River Fire Road
310 Rose River Loop
252 Saddle Trail (Old Rag Mt.) (no pets; no camping permitted on Old Rag summit above 2800 feet elevation)
349 Saddleback Mountain
228 Sam's Ridge Trail
224 Sam's Run
. 210 Shaver Hollow
214 Skinner Ridge
244 Skyland Fire Road
248 Sky land-Big Meadows Horse Tr .
334 Slaughter Fire Road
328 Smith Mountain
348 South River Area (no camping permitted)
347 South River Falls Trail
346 South River Fire Road
308 Spitler Hill/Haywood Mt.
320 Staunton River
243 Stony Man Mountain (no pets)
312 Stony Mountain Trail
315 Tanner's Ridge
240 Thorofare Mountain
258 Timber Hollow
313 Upper Dark Hollow Horse Trail
254 Weakly Hollow Fire Road
218 White Rocks Trail
256 Whiteoak Fire Road
255 Whiteoak Canyon Trail (no camping permitted between ~~first and fourth falls)~~ Upper Falls and Cedar Run Link Trail)

SOUTH DISTRICT CAMPSITE ZONES

401 AT (A) Swift Run-Simmons Gap - (Hightop Hut)
402 AT (B) Simmons Gap-Loft Mt - (Pinefield Gap Hut)
403 AT (C) Loft Mt - Doyles River Overlook
404 AT (D) Doyles River-Blackrock Gap - (Blackrock Hut)
405 AT (E) Blackrock Gap-Jarman Gap
406 AT (F) Jarman Gap-Rockfish Gap - (Calf Mt. Shelter)
459 Abbott Ridge
444 Austin Mountain
431 Bear-wallow Run
412 Beldor Ridge
472 Big Branch
435 Big Run
468 Blackrock Gap
433 Brown Mountain
445 Browns Gap
446 Browns Gap Road
474 Calvary Rocks
450 Cedar Mountain
479 Cool Spring Hollow
463 Crimora Road
443 Deep Run
495 Dorsey Hanger Hollow
447 Doyles River
499 Dundo Campground
456 Dundo Hollow
452 Dundo Reservoir Road
409 East Swift Run
420 Eaton Hollow
437 Eppert Hollow
423 Flattop Mountain
458 Furnace Mountain
413 Gap Run
485 Gasline Road
498 Goat Ridge
460 Hall Mountain
494 Hangman Run
410 Hanse Mountain
490 Hawksbill Creek
416 Hightop Mountain
417 Hightop Road
465 Horsehead Mt.
427 ivy Creek
487 Jarman Gap

448 Jones Run
467 Lefthand Hollow
442 Lewis Mountain
440 Lewis Peak
449 Little Flat Mountain
470 Little Gate Branch
432 Loft Mountain (not Loft Mt. Campground)
499 Loft Mountain Campground
411 Lower Hawksbill Creek
441 Lower Lewis Run
457 Luck Hollow
455 Madison Run
461 Miller Run
469 North Fork Moormans River (flood damaged - Day Use Only)
430 One Mile Run
466 Paine Run
436 Patterson Ridge
426 Pinefield Gap
454 Pinestand Mountain
473 Pond Ridge
496 Pond Ridge Branch
419 Powell Gap
476 Riprap Hollow
475 Rocks Mountain
414 Rocky Mount
434 Rocky Mountain Run
438 Rockytop
493 Roundtop
497 Sawlog Ridge
483 Sawmill Ridge
484 Sawmill Run
471 Shop Run
421 Simmons Gap
415 Simmons Gap-Beldor Road (west side)
422 Simmons Gap-Fork Hollow Rd. (east side)
418 Smith Roach Gap
488 South Dist. Crosscountry East
489 South Dist. Crosscountry West
491 South Dist. Boundary East
492 South Dist. Boundary West
499 South District Developed Area (i.e. Loft Mt. Campground, etc.)
486 South Fork Moormans River
462 Stull Run
407 Swift Run Gap
478 Thorofare Ridge

464 Trayfoot Mountain
481 Turk Branch
480 Turk Gap
482 Turk Mountain
429 Two Mile Ridge
428 Two Mile Run
424 Upper Hawksbill Creek
439 Upper Lewis Run
451 Via Gap
425 Weaver Mountain
408 West Swift Run
453 Wildcat Hollow (Pasture Fence Mt.)
477 Wildcat Ridge

Permit Issuing Station Codes: (Blocks 79 - 80)

North District:

Front Royal Entrance Station	11
Dickey Ridge Visitor Center	12
Mathews Arm Campground	13
Thornton Gap Entrance Station	14
Thornton Gap Information Station	15
Miscellaneous - North Dist.	16
Piney River	17
Tom Floyd Wayside Self-Reg.	19

Central District:

Byrd Visitor Center	21
Big Meadows Campground	22
Lewis Mountain Campground	23
Miscellaneous - Central Dist.	26

South District:

Swift Run Entrance Station	31
Loft Mountain Campground	32
Simmons Gap	33
Rockfish Entrance Station	34
Loft Mountain Information Station	35
Miscellaneous - South Dist.	36

Park Headquarters:

Headquarters over-the-counter	41
Headquarters by mail	42

Future Actions

A. Implement all new procedures as described in this section.

B. Develop a computerized permitting system per the approved NRPP proposal.

12.4 Backcountry Fees

A permit fee program was established at the leased Nethers parking area at park boundary for Old Rag area trails in fall 1995. This action was primarily in response to park boundary access parking difficulties and seasonally severe crowding on Old Rag trails. Some details of this permit program are described in chapter 13.2, Boundary Access.

In 1996, to address the need for funding of necessary services which have not kept pace with demand, Congress directed the U.S. Department of the Interior, including the National Park Service, to implement the Recreation Fee Demonstration Program. The program intends to help spread some of the costs for managing public lands among those who use them. The Recreation Fee Demonstration Program allows a significant portion of the fees collected at SNP to be spent directly on behalf of the Park. The program is to continue for three years, at which point the program will be evaluated. The findings will determine a fee collection policy in later years. SNP determines which activities are to be covered by fees and, in some cases, visitors will have to pay for activities that have never had an associated fee. In 1997 a fee program has been initiated at park boundary trailheads including White Oak Canyon and Old Rag area parking lots in Berry Hollow in Central District and Little Devils Stairs parking lot in North District. These fee collection stations utilize pipe safes for "honor system" payment of fees by backcountry visitors. The portion of new fees which'are to be used on behalf of the Park are for a variety of projects identified by the park staff, including rehabilitation of trails damaged in recent years by storms.

The development of a computerized backcountry camping permit system is anticipated to occur with an associated program cost recovery fee and/or a new recreational use fee.

A. Design and incorporate backcountry camping permit fees program into backcountry program planning in anticipation of permit fees to be charged to backcountry campers.

CHAPTER 13
PARK BOUNDARY MANAGEMENT

13.1 Adjacent Related Lands

"Scenic views, trout streams, black bears, lush plant life... Shenandoah National Park was created to preserve this beautiful mountain sanctuary for all to enjoy. Increasingly, we find that we must look beyond Park lands to protect the values for which Shenandoah was created. The Related Lands Study is providing information which is essential to our ability to carry out this mission. " This statement is from the July 1992 SNP Employee Bulletin describing the Related Lands Study .

The purpose of the Related Lands Study is to undertake a resource inventory of the lands with a direct ecological or land use relationship to the Shenandoah National Park. The study will for the first time, assemble all the resource information about the park and its surrounding communities in a single location. The data will be used to create a sound technical base for future joint planning activities by the park and its surrounding communities. The study is being conducted because the Shenandoah National Park can no longer be seen as an island isolated from its neighbors. The use of land surrounding the park has a tremendous impact on what happens within it. The park is interested in finding out how the changes that are occuring outside its boundary affects their ability to manage the resources within it. The park is also looking to work closely with the counties surrounding the park to develop locally based initiatives that conserve those resources that may be valued by both. In addition, the park expects that as a result of the full study, a set of criteria will be developed that can be used to evaluate the significance of lands being offered by donation..

Those issues being addressed by the Related Lands Study which have -direct impact on park backcountry recreation management includes recreation access to trails and streams, trailheads and the problems they can create for abutting property owners, and activities within the park that affect nearby private property owners.

13.2 Boundary Access

Boundary access issues often affect the relationship between the Park and its neighbors. Boundary trailheads provide easy access for many local visitors to enjoy and appreciate the park. Boundary trailheads attract much use by visitors from outside the local area and can contribute to the local economy. Many boundary trailhead areas have "guaranteed access" public right-of-ways through private lands as described in the Park's GMP. Other boundary accesses remain open to the public at the discretion and good will of the private landowner. Guaranteed boundary accesses are often the result of historical State-owned, cross-mountain road right-of-ways which existed prior to establishment of the Park. When the roads were abandoned by the State, public right-of-way access outside of the Park was often retained through otherwise private land. Some boundary trailhead accesses are located adjacent to State or County maintained roads. Unfortunately, boundary access can have negative impacts on the relationship the park

has with its neighbors. A few boundary accesses at private land receive abuse often associated with heavy visitation including illegal camping, litter, trespassing, vandalism, parking, and noise. Accesses are sometimes used by visitors with mountain bikes, ATV's, and other equipment not compatible with park values, regulations, or the desires of the abutting landowner. It is difficult to control uses and abuses on Park boundary other than with signing and intermittent ranger patrols. Some landowners who have allowed access in the past have recently closed boundary trailhead accesses citing some of the above described problems in their reasoning.

Very few boundary accesses have formal parking lots available and parking is frequently very limited or non-existant. Many accesses are unsigned and difficult to recognize or negotiate even with a good map. It is important that park employees provide boundary access condition information to visitors wishing to access the park by boundary trailhead. Park backcountry permit issuing stations and visitor centers in particular should maintain current information on boundary access descriptions.

Old Rag Boundary Access Issues

One area that receives very heavy visitor access pressure is the Old Rag boundary area. Since fall 1995 a fee permit system has been implemented at Old Rag. Objectives are to reduce the impacts to adjacent private landowner property and to mitigate human overuse in the Old Rag wilderness on weekends and holidays between Memorial Day and the last weekend in October. This is done by limiting parking to 200 cars in the temporary parking lot and charging a fee at the staffed Contact Station (where there is also a variety of backcountry and resource-related information available including backcountry camping permits, hiking route alternatives, etc.). Possession of a hiking permit is verified at the Ridge Trail Trailhead before hikers can enter the area. If there are more than 200 cars at the temporary lot, all excess cars are turned away and advised of other hiking/camping options.

As of November 1996, the fee permit system did seem to be reducing visitor impacts to landowners and visitor overcrowding/overuse effectively. During 1995-1996, visitors had to be turned away only twice at the temporary parking lot. This action will continue and will be monitored for effectiveness; the action may be modified upon completion of a visitor survey to be conducted in the near future.

Future Actions

A. Confirm all boundary access points as described by the Park GMP. Obtain guaranteed access right-of-ways at boundary access trailheads which do not have this status and abandon those accesses which do not favor public use.

B. Foster good relationships with Park boundary neighbors; assure Park administrative access for emergency use where public boundary access does not exist.

C. Perform a social science survey in the Old Rag boundary area to assess backcountry visitor perceptions of Old Rag area conditions, identify appropriate social indicators for the area, and develop an efficient monitoring program for social science indicators.

D. Examine boundary trailhead public access points for feasibility for possible implementation of a boundary access permit/fee program.

Table 13.1

NORTH DISTRICT BOUNDARY TRAIL ACCESS
(revised 2/98)

EAST SIDE:

TRAIL	USE	COMMENTS
HICKERSON HOLLOW (from Rt. #604)	Horse Foot	Good access; parking for 3 cars along roadside
NORTH AT/TOM FLOYD (Rt. #602)	Foot	Good access; parking for 3 cars along roadside
COMPTON GAP (Rt. #610)	Horse Foot	Good access from Chester Gap; parking for 5 cars
JORDAN RIVER (Rt. #629)	Horse Foot	Fair access; parking for 4 cars along roadside; trail access not plainly visible
MT. MARSHALL (Rt. #625)	Horse Foot	Good access; parking lot for 5 to 8 cars
HARRIS HOLLOW (Harris Hollow Rd)	Horse Foot	Poor access; parking limited to 1 or 2 cars along roadside
KEYSER RUN (Rt. #614)	Horse Foot	Good access; parking for about 10 cars at Little Devil Stairs parking area; do not block road
LITTLE DEVILS STAIRS (Rt. #614)	Foot	Same as Keyser Run

PINEY BRANCH (Rt. #600)	Horse Foot	Fair access; parking in the area is very limited along roadsides;. do not block gate or road
THORNTON RIVER (Rt. #612)	Horse Foot	Fair access; parking in the area is very limited along the roadside: do not block road or private driveways
PASS MOUNTAIN (US Rt. #211)	Foot	Good access from highway; parking for about 4 cars across highway
WEST SIDE:		
DICKEY RIDGE (US Rt. 340)	Foot	Parking for about 6 cars at north entrance of Skyline Drive
LANDS RUN (Rt. #622)	Horse Foot	Good access for 2 cars along roadside
JENKINS GAP (Rt. #634)	Horse Foot	Fair access; limited parking along roadside
BROWNTOWN (Rt. #631)	Horse Foot	Poor access; very limited parking along rodside; access is not plainly visible
MATHEWS ARM (Catron Rd)	Horse Foot	Poor access; very limited parking along roadside; access is not plainly visible

THOMPSON HOLLOW (Thompson Hollow Rd)	Foot	Good access; parking for 3 cars; do not block gate or turnaround area
TUSCARORA (US Rt. #340)	Foot	Fair access; very limited parking along shoulder of highway
HEISKELL HOLLOW (from Rt. #697)	Horse Foot	Poor access; not recommended
JEREMYS RUN (from Rt. #611)	Foot	Temporary access; trail relocation to Rt. #611 from boundary
ROCKY BRANCH (Rt. #666)	Horse Foot	Fair access; can be difficult to locate; parking is limited to 1 or 2 cars at base of private driveway

Table 13.2

CENTRAL DISTRICT BOUNDARY TRAIL ACCESS
(revised 2/98)

EAST SIDE:

TRAIL	USE	COMMENTS
BUCK HOLLOW (Rt. 211)	Foot	Good access; parking for 4-5 cars in pullout
HAZEL COUNTRY (Rt. 600) includes Hazel R., White Rocks, Sams Ridge	Foot Horse	Fair access; limited parking for 4 cars along roadside outside of gate; access through private land
BROAD HOLLOW (Rt. 681)	Foot	Good access; limited parking for 2 cars along roadside
PINE HILL GAP (Rt. 681)	Foot	Good public access; limited parking for 3 cars along roadside
NICHOLSON HOLLOW (Rt. 600-Nethers)	Foot	(1) Access through .5 mile of private land; parking for 4-5 cars at trailhead (2) Public access at Old Rag temporary lot for 200 cars
WEAKLEY HOLLOW (Rt. 600-Nethers)	Foot Horse	Good access; parking lot limited to about 15-20 cars (closed during permit season, weekends May-October); plus Old Rag temporary lot for 200 cars
BERRY HOLLOW (Rt. 600-Syria)	Foot Horse	Good access; parking for about 12 cars

WHITE OAK CANYON CEDAR RUN (Rt. 600-Syria)	Foot	Access through private land .2 miles; leased parking lot for 20-25 cars
ROSE RIVER (Rt. 670)	Foot Horse	Private access; limited parking for about 6 cars
RAPIDAN AREA Camp Hoover and environs (Rt. 649)	Foot Horse	Good access through park and RWMA; parking along roadside
JONES MOUNTAIN (Rt. 662)	Foot	Good access; limited parking for 4-6 cars at State parking area at park boundary
CONWAY RIVER (Rt. 615)	Foot Horse	Poor access through RMWA, road impassable .25 mile below park boundary gate; parking along roadside
SLAUGHTER TRAIL (Rt. 667)	Foot Horse	Fair access; parking for 2-4 cars at end of state road. Road washed out, in poor shape. Impassable ford across river
POCOSIN HOLLOW (Rt. 667)	Foot	No public access through private land; no parking available
POCOSIN FIRE ROAD (Rt. 637)	Foot Horse	Fair private access; road in poor shape before boundary. Limited parking along road at gate for 2 cars. Hike to Park .5 mile
SOUTH RIVER (Rt. 642)	Foot Horse	No public access. Gated and locked, no parking

WEST SIDE:

SKYLAND FIRE ROAD (Rt. 672)	Foot Horse	No public access; no parking, posted by private landowner
REDGATE FIRE ROAD (Rt. 611)	Foot Horse	Good access; limited parking along roadside for 4 cars
TANNERS RIDGE FIRE ROAD (Rt. 682)	Foot Horse	Good access; parking for 4-5 cars at lot
WEST BRANCH NAKED CREEK (Rt. 607)	Foot	Good access; parking for 5 cars. Not recommended, trail obliterated by flooding
EAST BRANCH NAKED CREEK (Rt. 759)	Foot	Poor access on private land; no parking
POWELL MOUNTAIN (Rt. 759)	Foot	Good access; limited parking along road for 1 car
MEADOW SCHOOL (Rt. 759)	Foot	Good access; parking for 5 cars. Trail in poor condition
DRY RUN (Rt.625)	Foot Horse	Fair private access; road before boundary in poor condition; limited parking for 3 cars

Table 13.3

SOUTH DISTRICT BOUNDARY TRAIL ACCESS
(revised 2/98)

EAST SIDE:

TRAIL	USE	COMMENTS
SMITH ROACH GAP ROAD (from Rt. #626)	Horse Foot	Fair access; parking for 2 cars near park gate
SIMMONS GAP ROAD (Rt. #628)	Horse Foot	Good access; parking for 2 cars near park gate
BROWNS COVE (Rt. #629)	Horse Foot	Fair access; limited parking along road, 1.2 miles from park boundary
NORTH & SOUTH FORK MOORMANS RIVER ROADS (Rt. #614)	Foot	Good access; parking for 10+ cars above Charlottesville Reservoir; parking for 4 cars near park gate on NFMR road (NOTE: due due June '95 flooding, NFMR road is day use only; closed to horse travel)
BUCKS ELBOW ROAD/JARMAN GAP (Rt. #611)	Horse Foot	Fair access; parking for 1 car at park gate; limited parking along road

WEST SIDE:

TRAIL	USE	COMMENTS
GAP RUN (from Beldor Hollow Rt. #628)	Foot	Poor access; 1 or 2 cars at pull out off Rt. #628

BELDOR ROAD/ SIMMONS GAP (Rt. #628)	Horse Foot	Good access; parking for 2 cars near park gate
ONE MILE RUN (Rt. #649)	Foot	No access; no parking, all private land is posted
BIG RUN PORTAL (from US Rt. #340)	Horse Foot	No access; no parking, all private land is posted
LEWIS PEAK (from Rt. #708)	Foot	No access; all private land is posted
MADISON RUN (Rt. #663)	Horse Foot	Good access; parking for 5 cars along road near junction of Rt. #663 and #708
PAINE RUN (Rt. #661)	Horse Foot	Fair access; parking for 3 cars at private turn-around at end of Rt. #661; No public access from Rt. #614
RIPRAP (from Rt. #612)	Foot	Fair access; parking for 2 cars at boundary; stream crossing may be rough; access confusing because of private development area
TURK GAP (from Rt. #612)	Horse Foot	No access; land is posted; route is difficult to find
GASLINE ROAD (Rt. #611/622)	Horse Foot	Poor access; limited parking along road; access is double gated on private land, but hikers & horse riders are welcome

13.3 Visitor Use Measurement

In addition to monitoring resource and social conditions in the backcountry, some measurement of the volume of visitor use in backcountry areas contributes to decisions on management actions. Backcountry visitor use statistics are maintained by the park headquarters dispatch office.

Backcountry overnight visits are determined from backcountry camping permit information (from camping party size and number of nights spent) and from PATC cabin use records. Backcountry camping permit visitor night information is routinely reported to the dispatch office at the end of each month by district offices or permit issuing stations. Presently there is no reliable system established for monitoring and tabulating general backcountry day use on park trails except for at boundary trailhead areas.

Park boundary access visitor use is monitored by a variety of methods throughout the park and is routinely reported to the dispatch office at the end of each month. The individual district operations use different strategies and systems to monitor boundary access use and to determine visitor use figures according to their needs and staffing levels. The following equipment and systems can be used to monitor this use:

A. **Trail register boxes** are designed and intended for visitors to voluntarily sign in on a register sheet (see sample in Appendices) at boundary trailhead locations. Information developed from register sheets may include a group leader or organization name, number of visitors in group, day or overnight hiking trip, and hike destination. The register box system enables park managers to monitor visitor use trends at specific boundary trailhead locations. The sign-in sheets are maintained in a roofed wooden box, mounted on a post, which has a drop-down front door to which the sheets are attached. Individual boxes may be checked a few times each month to monitor trail use conditions and develop trail boundary access use figures, Individual districts will have their own procedures for maintaining and monitoring the boxes.

B. **Trail counter systems** may be used in conjunction with boundary trailhead register boxes to establish a multiplier for register sheet figures compared to "actual" counter figures. The counter can be moved to various register box locations in the backcountry to assist in producing fairly reliable register box figures. Trail counter systems may be used on their own in backcountry locations to monitor visitor use volume trends. Types of trail counter systems include electronic infra-red sensor equipment, buried sensor pad equipment, and equipment which may permit mounting of camera monitors. Counter systems can be designed to measure specific types of trail use, such as mounting of specialized equipment to monitor stock use.

C. **Traffic counter systems** may be used in parking lot areas or on boundary area road surfaces. to monitor and measure the volume of vehicle use at a park

boundary trailhead. A multiplier may be developed to account for the number of passengers occupying vehicles to determine a reliable visitor boundary access figure.

D. **Head counts** provide the most accurate means of developing backcountry visitor use figures and monitoring levels of backcountry use. However, this method is extremely costly in terms of staffing commitment. It might be used in conjunction with other measuring systems to confirm reliability of other systems being used or to develop multipliers with other systems.

13.4 Boundary Marking Guidelines and Standards

The objective of maintaining the Park's boundary markings is to identify to any park visitors, neighboring landowners, and NPS or other agency personnel from points external to the boundary the definitive location of SNP boundary. This is particularly important in park resource protection involving such activities as fishing, hunting, ginseng gathering, timber removing, firefighting, and controlling of land development encroachment. Successful enforcement of resource protection laws on the Park boundary critically depend on the quality of boundary marking maintenance. A planned cyclic marking program is encouraged since many changes can occur to boundary identification over time: marked trees die and fall down, paint gets old and fades, squirrels or other animals gnaw and destroy signs, growing vegetation obstructs markings, signs can fall down, and signs are sometimes vandalized. Neglect of boundary marking makes it more difficult to maintain accurate and credible boundary identification in future years.

General Guidelines

The following guidelines have been developed for the field staff to effectively, efficiently, and consistently mark Park boundary.

Park boundary should be marked on an interval of 6 to 7 years. Each district should complete marking of at least 15 % of its boundary each year to meet this goal.

Avoid trespass of private land; obtain permission from any landowner whose property must be crossed to access the boundary. If possible, get permission to use any private roads. Check for standing permission from the landowner for NPS access or try to develop this agreement with landowners at important access areas. Cooperation with and respect for landowning neighbors is crucial to maintaining and improving neighbor attitudes about the park. It is important that boundary marking personnel understand that they are ambassadors representing the park and should go out of their way to communicate and cooperate with park neighbors.

Most boundary marking is accomplished in the late fall or early spring when vegetation is sparse, working temperatures comfortable, field staffing is improved over winter levels, and remote boundary areas are more accessible. As spring green-up progresses, well-placed

boundary markings can become hopelessly obscured and make boundary marking maintenance nearly impossible.

Park boundary identification must be accurate!

Documenting boundary marking work

In order to know what boundary areas are in need of maintenance and to maintain a cyclic boundary marking schedule, work completion records must be kept. Park survey monuments, which are numbered and set in concrete, are located on the ground (primarily at boundary corners and turns) along the entire Park boundary and are denoted on U.S. Geological Survey quadrangle maps. Current boundary maps are available from the Park surveyor. If there is difficulty in locating the boundary in the field, arrange to mark it when the surveyor can accompany a marking trip to locate the boundary.

Completed boundary marking can be tracked from one survey marker to another on an annual or seasonal basis. A record should be used to document marking dates, crew member names, starting and ending location points (perhaps using corner survey marker points), distance completed, observed disturbances or encumberances across the boundary (ie. rights of ways, roads, powerlines, encroachments, etc.), and boundary accesses used (including Park neighbor identification when private land is accessed). As a suggested example, a recording form is attached to these guidelines. Some boundary areas are rarely visited by NPS employees except when boundary marking work is accomplished. Therefore, the marking crew should be observant of any conditions along boundary which may be of concern to Park management; subsequent documentation of this information is very important.

Marking: the boundary

Paint

- Use bright red or orange paint.

- Paint blazes should be rectangular in shape, at least four inches wide by five inches long, and at least five feet off the ground.

- Try to apply a very thick coat of paint (thick enough to last 10-15 years). Pour off (and properly dispose of the "pouroff") the top inch or two of lacquer in each gallon to thicken the paint. Spray paint or use of paint sprayers is not recommended. Use a good sturdy brush to get paint thickly into cracks in tree bark.

- Repaint all old blazes (if they appear to be on the line) and paint new ones as needed. **Make sure that no trees are blazed outside of the park.** When in doubt, err to the inside of the park. Use trees within three feet of the actual boundary if possible. Keep in mind that some trees may die and fall prior to the next marking and that visibility of markings are reduced substantially after spring leaf-out, so blaze generously.

- Restore and paint rock cairns found along the boundary line by marking a line across the rockpile parallel to the boundary line. These are often the most accurate representatives of the surveyed boundary. When marking boundary, try to use these rock cairns as reference points to keep the boundary line straight and accurate. Workers may have to walk ahead to locate a cairn, then return to where marking was left off to reduce erroneous marking.

- When the boundary line passes through an area with much exposed rock and no trees are available to mark, look for old blazes on rocks which should be repainted.

- To mark a previously unmarked tree, cut a blaze in the tree with a sharp hatchet or use a paint scraper to remove bark. Do not injure the tree by cutting into the cambium. Paint this to make the paint last much longer.

- Mark only the longest-lived tree species possible. Avoid marking short-lived small tree species such as striped maple except as a last resort.

- Make sure that blazes face outside the park.

- On larger trees, two paint blazes may be needed (see Figure 13.1).

- The boundary should be marked so that a blaze or slat can be seen from one to the other in either direction along the boundary. Use more blazes at boundary access points (ie. roads and trails) and developed areas.

- Use three hacks in a vertical line down a tree to signify a boundary corner. A hack is a straight chop into a tree (but not into the cambium) that will last for many years and is easy to identify. If a corner is marked in this way, mark it again even if it doesn't look like a corner. Mark unmarked corners as such only after confirming to make absolutely sure (see Figure 13.2). A corner is confirmed by a numbered brass marker cemented to a well-anchored rock (sometimes covered with years of soil and debris), usually marked with a rock cairn.

Slats

- Plastic or metal slats which identify the boundary as US/NPS lands are available at the Park warehouse and district offices and are ordered through the Procurement Officer. At least 500 of these should be available in each district to meet seasonal boundary marking needs.

- Try to slat every other tree in high use areas, but be more sparing in more remote areas of boundary. Allow the nails to stick out from the slat about an inch to allow for tree growth.

- If a slat is already in place and in good shape, just add nails (with one inch allowance)

to give the tree growing room. Leave all old slats unless out of bounds or in very poor condition.

- Use aluminum nails or other rust resistant nails at least two inches long with large heads. The south district has used #8 galvanized steel nails with good success.

- Use the large horizontal metal slats to mark corners (see the guideline section on corners in the paint standards above). These can also be used on any large prominent trees since the newer plastic slats will probably last only 6 to 10 years.

- Try to slat trees immediately adjacent to trail junctions, old paths, and fishing streams.

- Try to avoid putting slats on short-lived tree species. Do not slat dead or dying trees.

Guidelines for Boundary Marking of Land Surveved in the 1990s

In the 1990s, as the park boundary changes through land donation, land exchanges, or correction of existing marked lines, much boundary survey work is being performed by private contractors. Modern surveying and boundary marking techniques have changed significantly from those of the 1930s when most park boundary was surveyed.

The most important change is that “corner trees” are no longer being established and referenced. Corner survey monuments and “point on tangent” monuments are established using aluminum monuments with flared bottoms set in the ground. The monument is then referenced by three “bearing trees” which triangulate to the monument location. A bearing tree is marked by removing a portion of the bark at the base of the tree, then inscribing the letters "B" over "T" on the exposed wood surface, then setting a nail. This area is then painted orange. Bearing trees would be used to re-establish a corner if the corner monument is lost or destroyed.

When a section of boundary is remarked, there is no need to repaint the bearing trees, but it is helpful to choose and paint an “unofficial” corner tree in the traditional style used elsewhere to make those corners easier to find in years to come.

Other different marking techniques that you might find are:

1. Trees that are “on line” will be marked or painted on either side of the tree as if to show the boundary line passing through the tree.

2. Only trees which are within 3 feet of the survey line are marked or painted. Therefore, the new line may have to be repainted by NPS staff when a surveying contract is completed to have adequate paint marking the line.

3. Contract survey work usually only includes setting monuments and painting new boundary line. Slatting is performed by NPS staff.

As of 1992, the newest style of vertical NPS boundary slat supplied by GSA is a fiberglass type slat with decal type lettering without nail holes. It might be preferred to pre-drill nail holes before taking the slats into the field. It is unknown how well the decal lettering on the fiberglass slats will hold up to the natural elements.

Figure 13.1 Two paint blazes are often needed on larger trees

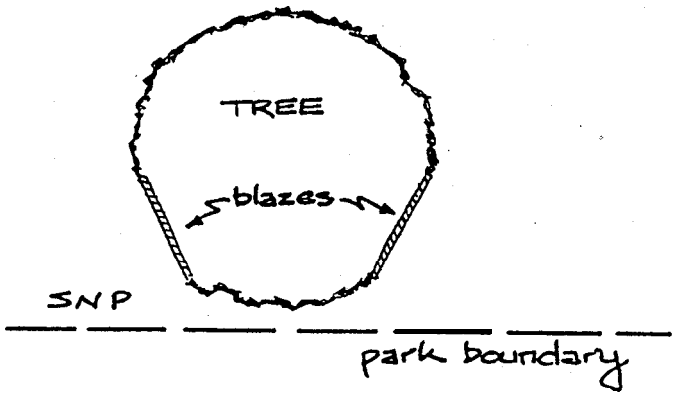
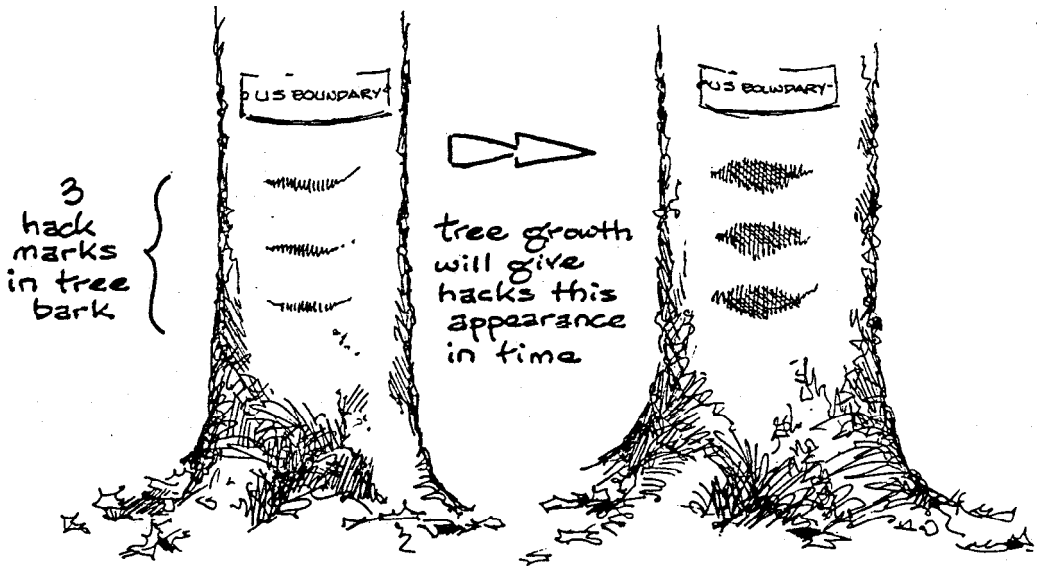


Figure 13.2 Marking a tree to signify a boundary corner



Future Actions:

A. Assure that each district has staffing to perform routine seasonal boundary marking; perhaps develop a crew which rotates between this and other backcountry maintenance responsibilities.

CHAPTER 14
BUDGET AND STAFFING NEEDS

Most elements of the BWMP can be implemented with existing park staff. Some sections of this plan are subject to the objectives and performance of other park management plans, from whose budgeting and staffing limitations have significant impacts on backcountry management action. Specific management plans which directly impact some backcountry management needs include hazard tree management and cultural resources management.

Staffing Needs Assessment

To achieve the monitoring programs and management actions described in this plan and including overall backcountry law enforcement operations, the following staffing needs are identified:

A. 1 GS-11 Supervisory Resource Management Specialist, to administer the parkwide backcountry and wilderness management program including the backcountry camping permit system, trails management, boundary management, campsite management, backcountry visitor use monitoring, other backcountry planning and programs (in addition to natural/cultural resource management and other duties) **(1 FTE) (1998 funded: 1 FTE @ 1 GS-11);**

B. 1 GS-9/11 Supervisory Resource Management Specialist, to manage the parkwide trails program, including other backcountry and wilderness program responsibilities **(1 FTE) (1998 funded: 1 FTE @ 1 GS-9 Park Ranger);**

C. 1 GS-9/11 Supervisory Resource Management Specialist, to provide parkwide backcountry and wilderness program assistance **(0.25 FTE) (1998 funded: 0.25 FTE @ GS-9);**

D. 1 GS-9 staff ranger, to administer parkwide field backcountry management program and backcountry office with collateral duties **(1 FTE) (1998 funded: 0 FTE);**

E. 3 STF GS-7 (BioTech) work leaders to direct a variety of backcountry monitoring and management programs within each administrative district (in addition to other RM) (2 **FTE) (1998 funded: 2 FTE @ 1 GS-5 term appt. and 2 GS-5 temporary);**

F. 1 STF GS-4 clerk to manage a centralized backcountry office in one of the administrative districts (administrative tasks, coordinate backpacking permit system, manage computerized programs) **(0.75 FTE) (1998 funded: 0 FTE);**

G. 3 temporary GS-4 (BioTech) field workers, each assigned to an administrative district to perform a variety of tasks including backcountry sign management, district backpacking permit system management, construction and maintenance of designated

backcountry campsites, rehabilitation of impacted backcountry campsites, document backcountry visitor use information, and conduct campsite and other monitoring programs (in addition to other RM) **(1.5 FTE) (1998 funded: 0 FTE);**

H. 3 WS-(3?) trails supervisors ((Maintenance Worker Supervisor), each assigned to an administrative district to direct and supervise a trail crew and perform trail maintenance, trail condition evaluations, and park boundary marking, coordination with trailwork volunteers, and general trail system management (3 **FTE)** (1998 **funded: 3 FTE @ WG-6 MVO);**

I. 3 STF WG-5 (Maintenance Worker), 1 assigned to each administrative district to perform as assistant crew leader in trail maintenance and boundary marking (2.1 **FTE) (1998 funded: 1.25 FTE @ 1 WG-3 MVO, 1 WG-5 MVO)**

J. 6+ temporary WG-3 (Laborer), 2 assigned to each administrative district to perform trail maintenance and boundary marking **(4.5+ FTE); (1998 funded: 4.5 FTE @ 5 temporary WG-3 laborer, 1 temporary GS-4 ForTech)**;

K. 4 GS-9 backcountry law enforcement personnel, one each assigned to north and south districts and two assigned to the central district to perform backcountry patrols, investigations for resource protection, and monitoring for park boundary encroachments and special use permit compliance (these district positions may be shared with and supervised by district frontcountry/backcountry law enforcement operations) **(4 FTE) (1998 funded: approximately 2 FTE);**

L. 7 STF GS-9 backcountry law enforcement personnel, two each assigned to the north and south districts and three assigned to the central district to perform backcountry trails and resource protection patrols (these district positions may be shared with and supervised by district frontcountry/backcountry LE operations) (6.4 **FTE) (1998 funded: approximately 2 FTE);**

M. 3 temporary GS-7 interpretation/education personnel, one assigned to each of the administrative districts to provide minimum impact backcountry camping workshops for the public, provide interpretive backcountry/wilderness programs, contact backcountry users at busy trailheads, produce interpretive backcountry brochures, video programs, etc., as needed **(1.5 FTE) (1998 funded: 0);**

N. 3 temporary/part-time GS-4 and 1 full-time temporary GS-5 lead Visitor Use Assistants to perform visitor contacts, administer Old Rag permit system, issue backcountry camping permits, manage contact station at Weakly Hollow/Old Rag **(1 FTE) (1998 funded: 1 FTE)**

0. 1 GS-11 Archeologist to do site-specific archeological clearances on all new and rehabilitated .backcountry campsites, trails, etc. **(1 FTE) (1998 funded: 0)**

P. 1 GS-9 Wilderness Education Coordinator to administer and conduct backcountry and wilderness education programs, direct the regional NPS Leave No Trace program, coordinate interagency and organizational outreach education programs, perform budgeting and manage a grants program **(1 FTE) (1998 funded: 0.50 FTE @ 1 term appt. Park Ranger)**

Recommended TOTAL FTE: 32.00 1998 FUNDED FTE (approx.): 18.50

Other Staffing and Budget Needs/Funding

In addition to recommended staffing to be funded by ONPS, in fall 1996 the Park received approval of a Natural Resources Preservation Program (NRPP) request to implement this BWMP over a three-year period beginning in FY99. Project costs are included in the NRPP proposal (RMP Project Statement SHEN-N-030.002) which is attached in the Appendices (chapter 16.3).

Future Actions

A. Strive to meet staffing needs to improve the ability of the SNP backcountry/wilderness program to meet GPRA goals.

B. Manage NRPP planning to successfully accomplish BWMP implementation.

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Shenandoah National Park

BACKCOUNTRY & WILDERNESS MANAGEMENT PLAN

August 1998

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BACKCOUNTRY/WILDERNESS MANAGEMENT PLAN
Shenandoah National Park

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CHAPTER 1
Introduction

1 .l Executive Summary

Resource professionals are challenged to develop effective approaches to wilderness management now - while there is still time to develop policies and strategies by design - rather than wait until problems are racing out of control and our efforts can, at best, be reactions to pressing needs. (Hendee, 1974, p. 28 from Hendee et al., Wilderness Management, 1990, p.4)

Revision of the 1984 Backcountry Management Plan was identified as a high priority Shenandoah National Park (SNP) goal by its employees in 1991. Park staff recognized that many backcountry and wilderness management issues were not being addressed effectively by the existing plan. In November 1991 an interdivisional Backcountry and Wilderness Management Plan Task Force was created to identify and resolve SNP backcountry and wilderness management issues. Initially the task force identified numerous issues unresolved by the existing plan, some of them quite complex, and identified the need to develop a planning framework to provide an organized response to these and unforeseen future issues. Advice and assistance was sought from backcountry and wilderness managers nationwide. With the assistance of Dr. Jeff Marion at the Virginia Tech NPS Cooperative Park Studies Unit (CPSU) the task force gathered volumes of literature related to backcountry and wilderness management issues and planning and researched these materials to develop a planning framework for SNP. A planning framework using concepts provided by "Limits of Acceptable Change" and "Visitor Impact Management" and employing a conceptual model called the "Recreational Opportunity Spectrum" was adopted to apply to SNP backcountry and wilderness management issues.

The task group proposed that this new Backcountry/Wilderness Management Plan (BWMP) also be prepared as a backcountry "sourcebook" useful to interdisciplinary field staff. The resulting document is a comprehensive SNP backcountry management guide which describes not only the planning framework and recommended management actions, but addresses topics including historical SNP backcountry management, relationship to other Park planning documents, SNP backcountry facilities and recreational uses, wilderness awareness education, management of recreation impacts (ie. campsite and trails management strategies), budget and staffing assessment, and Park boundary issues. The BWMP addresses backcountry recreation management specifically and all issues concerning the Wilderness Act. This BWMP is intended to be used as a "working" document which shall be revised as frequently as necessary to reflect changing SNP backcountry conditions and management issues.

An important contribution this BWMP makes to SNP are the new planning frameworks and concepts which can be applied to other aspects of the park operation. Most important, the plan marks a new era of SNP backcountry management by applying wildland recreation research accomplished in the past two decades of evolution of backcountry and wilderness management. As backcountry/wilderness managers we need to continually apply innovative strategies to provide for recreational opportunities yet limit impacts to the park resources. Regardless of how

our overall vision and goals for the backcountry may change over time, we will always need to analyze how well goals are accomplished and adjust our strategies and actions as the types of recreational opportunities change, the reasons for why people recreate change, and the techniques for management and monitoring evolve.

To meet the requirements of the National Environmental Protection Act (NEPA), an Environmental Assessment (EA) analysis has been prepared and is provided in the Appendices. The BWMP has also been reviewed and approved by the SNP Cultural Resource Management Specialist in the context of the National Historic Preservation Act (NHPA), Section 106. Public involvement in preparation of this document includes input from various special interest organizations and individuals.

1.2 History of Backcountry Use and Management

Backcountry management in SNP is a mixture of recreation and visitor management, wilderness management, and resource protection. Many of the backcountry management practices followed today in the Park have been derived from practices or ideas that existed before Congress established the Park. The historical timeline that follows this text illustrates this progression.

The United States Congress authorized SNP in 1926 and established it in 1935 when 176,429 acres were accepted from the Commonwealth of Virginia. By this time many miles of trail and several backcountry shelters existed. Park visitation was high and recreation had become a traditional use of the area.

Prelude to Establishment

During the same period that SNP was established, the need for a nationwide system of wilderness preserves was suggested by Benton McKaye in 1921. The need to actively manage backcountry and wilderness lands to minimize the effects of overuse was suggested by Robert Marshall in 1933 (Nash 1982). McKaye is most often remembered as the first proponent of the Appalachian Trail (AT) which, as he proposed, now runs the length of the Appalachian mountain chain, from Maine to Georgia and through SNP. Today Wilderness designation and existance of the AT contribute to the Park's character.

In 1927, shortly after Congress authorized the Park, the Potomac Appalachian Trail Club (PATC) was formed to regionally promote the AT building effort and to foster the proposed park (Lambert 1979). The early efforts of this organization are the beginnings of backcountry management in Shenandoah National Park. In 1928 the PATC built its first section of trail within the boundary of the proposed park. And in 1930 they constructed the first trail shelter in the U.S. south of New England. It was built near Pinnacles for the sum of $930.00. By 1931 the PATC reported completion of 260 miles of trail, much of it within the Park boundary.

Congress authorized Skyline Drive in 1931. The Skyline Drive displaced several sections of the AT and several shelters, and it effectively converted some of the backcountry to frontcountry and made the entire area more accessible. This and the prominent placement of the road was

opposed by some people. In 1934 the Wilderness Society was conceived at an impromptu meeting along the edge of the Drive. In part the founders hoped to fight against all skyline drives, which they believed detracted from scenic resources.

When Congress authorized the Park, several generations of inhabitants had already lived within the boundaries. This made management of the proposed park an exercise in restoration rather than preservation, an exercise complicated by popularity. For example, in the year prior to establishment, 516,000 people visited the park. By 1937 SNP had become the first National Park to be visited by more than one million people in a year.

Reassertion of Nature

While recreation management was an early concern, natural processes reestablished themselves during a period of relatively minimal backcountry visitation. For example, backcountry management during the 25 year period between Park establishment and 1960 was marked by the construction of a backcountry recreation infrastructure. The 96 mile SNP portion of the AT was completed in 1938. In 1941 PATC reported that 17 three-sided shelters existed in the park (Lambert 1979). Backcountry management of the time did not focus on mitigating the effects of recreation, as it does today, because the number of backcountry visits was not perceived to be causing problems. The effects of recreation were considered to be quite minimal.

Much of the physical recuperation of the backcountry occurred during these early years. Overall visitation dropped during World War II. In 1943 the Park reported 42,000 visitors. This calm period at the park is thought to have allowed vegetation to make significant progress toward masking indications of earlier human settlement (Lambert 1979). Efforts to maintain existing trails expanded shortly after the war when the Park accepted an offer from the PATC to maintain primitive trails. By 1953 the park reported 429,988 visitors. For the first time, annual backcountry overnight visits were also reported at 8,655.

Resource Preservation

A new period of backcountry management began in the early 1960s and extended to the mid-1970s. In 1964, after prolonged public debate, Congress signed the Wilderness Act (Public Law 88-577). That year Superintendent Taylor Hoskins, who started serving at the Park in 1960, began discussing the possibility that some lands in SNP might qualify for wilderness area designation based on the recovery that had occurred (Lambert 1979). The PATC, National Parks Association, Wilderness Society, Sierra Club and others began in 1966 to promote an expanded understanding of the lands that might be appropriate for the National Wilderness Preservation System. Prior to the efforts of these groups, eastern lands were rarely considered for protection as wilderness. In 1970, however, the Director of the NPS recommended that 73,280 acres of SNP's backcountry be designated wilderness.

During this time the Park began to experience a great increase in visitation. By 1967 intended capacity at the frontcountry campgrounds was exceeded so frequently that Superintendent Hoskins instructed Park staff to direct visitors to the backcountry on exceptionally busy days (Jacobsen & Johnson 1992). That year the Park reported 34,000 overnight backcountry visits.

Superintendent Robert Jacobsen began to serve at the park in 1972. Visitation continued to increase. During the short interim period between superintendents Hoskins and Jacobsen, a designated campsite management policy was implemented at the park. Overnight backcountry visitors were told they must camp within sight of red stakes erected or at existing shelters at 39 designated areas. Additionally, the Park began to require campfire permits. In 1973 the park reported over 121,000 backcountry overnight visits. Managers at the time describe the designated camping areas as resembling carnivals, with no privacy and exhibiting significant resource impacts (Jacobsen 1986).

Backcountry overnight visits again exceeded 120,000 at the Park in 1974. Superintendent Jacobsen replaced the designated site policy with one of required dispersal. A set of regulations were established to promote the new policy and to protect resources. New rules included a requirement that visitors obtain camping permits and a prohibition on backcountry campfires (Jacobsen 1986).

Table 1.1

1. Backcountry Visitor Regulations established in 1974.

1. Backcountry Permit required.
2. Group size limited to 10.
3. Camping prohibited within:
   a. 250 yards or in view of paved park road or park boundary.
   b. 1/2 mile or in view of any park facility except a trail shelter.
   c. view from any trail or camping prohibition sign.
   d. view of another camping party or a trail shelter (except in time of storm).
4. No more than two (2) consecutive nights in a single location defined by a 250 yard radius.
5. Glass containers prohibited.
6. Human waste relief not allowed within 10 yards of streams, trails, roads, or facility.
7. Fecal material must be placed in a hole and covered with at least three (3) inches of soil.

Part I, Sec. 7.15(b), Title 36, Code of Federal Regulations

Congress signed Public Law 93-622 authorizing eastern wilderness areas in 1975, and in 1976 enacted PL 94-567, designating 79,019 acres of it in the Park with 560 acres of potential additions. As part of the designation, Big Run shelter was removed from the backcountry, as were all man-made water developments except those that predated the establishment of the Park.

Recent Resource Protection

After 1976 and continuing to the present, backcountry management at the Park began to change. Scientific methods have become more commonly applied. In addition, visitation dramatically dropped by the mid-1990's. In 1976 West Virginia University conducted the first survey of

backcountry campers in the Park (West Virginia University 1977). They also conducted a survey of trail users in 1977.

Congress expanded SNP wilderness area to 79,579 acres in 1978. During this year the park reported 75,000 overnight visitors, of whom 80% arrived between May and October and 90% stayed only one night (Lambert 1979). Overnight camping continued to decline. In 1981 the Park reported 61,000 overnight backcountry visits.

During this period, backcountry visitation remained high for a Park of SNP's size. Park staff became concerned about obvious and widespread environmental impacts in popular camping areas. In response, from 1981 to 1983 the park compiled data to document the condition found on a sample of campsites. Approximately 1300 campsites were estimated to exist. In addition, in a related effort during this period, Park staff rehabilitated 89 campsites throughout the three districts (Marion and Haskell 1988).

The Park staff completed a Backcountry Management Plan in 1984 as an action plan called for by its Resource Management Plan (RMP). This Backcountry Management Plan emphasizes recreation management, wilderness management, and resource protection. The basic objectives for the plan were to provide an opportunity for resource-dependent backcountry visitor experiences while maintaining the integrity of natural ecological processes and minimizing the effects of recreation. Additionally, it integrated with such diverse yet complementary efforts as the Bear Management Plan and Fire Management Plan.

Superintendent Bill Wade began serving at the Park in 1987 and continued the efforts begun earlier. From the 1991 RMP, the park called for a revision of the 1984 Backcountry Management Plan. Superintendent Wade appointed an interdivisional Task Force to revise the plan. The Task Force drew members from the maintenance, resource protection, interpretation, and resource management divisions of the park. Additionally, to gather current information concerning the condition of the backcountry campsites and to assess the policy of dispersal, in 1992 the park initiated a campsite monitoring program with the cooperation of the Cooperative Park Studies Unit (CPSU) at Virginia Tech. Initial results from an extensive inventory reveals 800 campsites, almost a 50% decline from the survey conducted a decade earlier.

Table 1.2

BACKCOUNTRY MANAGEMENT IN SHENANDOAH NATIONAL PARK

1888 Skyland established as the first operation intended to promote recreation in what would become SNP.

Prelude to Establishment

1926 US Congress authorizes SNP with the stipulation that sufficient land must be acquired by state or private efforts.

1927 Potomac Appalachian Trail Club (PATC) formed to regionally promote both the newly initiated Appalachian Trail (AT) and the proposed national park.

1928 PATC constructs its first section of trail near Pinnacles between Thornton Gap and Skyland, the first section of the AT built by PATC.

1930 PATC constructs first trail shelter south of New England. It is located near Pinnacles and cost $930.00 to complete.

1931 Congress authorizes Skyline Drive. Construction of the Skyline Drive overlaps and displaces portions of the AT. PATC reports 260 miles of trail have been constructed in the area authorized for SNP.

1934 Wilderness Society conceived during an impromptu meeting within the borders of the proposed park.

'eassertion of Nature

1935 SNP established at the end of December with the acceptance by Congress of 176,429 acres from the Commonwealth of Virginia. More than 516,000 people visited the proposed park during the year prior to its formal establishment.

1937 SNP becomes the first national park to be visited by more than one million people in a year.

1938 The 96 mile SNP portion of the AT is completed.

1941 PATC reports 17 three-sided shelters exist in the Park.

WWII Visitation drops dramatically. Impressive vegetation growth during this period begins to mask indications of earlier human settlement:

:t-War Superintendent authorizes expansion of the trail system after PATC complaints emerge regarding trail damage from equestrian use. Park accepts PATC offer to maintain primitive trails.

1953 Park reports 429,988 overnight visitors from June through August, but only 8,655 stayed in the backcountry.

esource Preservation

1960 Superintendent Taylor Hoskins begins to serve. 25th Anniversary of Park.

1964 Congress signs Wilderness Act. SNP Superintendent Hoskins begins discussing the possibility that some areas of the Park might qualify for wilderness based on the degree of its recovery from pre-park land uses.

1966 PATC, National Parks Association, the Wilderness Society, Sierra Club, and others begin working toward an expanded understanding of what constituted appropriate land for wilderness system inclusion.

1967 Park reports 34,000 overnight backcountry visits. Camping at designated campgrounds frequently surpass capacity. Superintendent Hoskins instructs park staff to direct visitors to the backcountry when campgrounds are full. Additionally, managers speculate that public debate over potential wilderness designation helped make popular backcountry camping in the Park.

1970 NPS Director recommends 73,280 acres of SNP be designated as wilderness area.

1972 Superintendent Robert Jacobsen follows Hoskins as superintendent at SNP. During the short interim period between superintendents a designated campsite management policy is implemented in the Park. Visitors are told they must camp within sight of red stakes erected at designated campsite areas. These campsites and shelter areas comprised 39 designated areas. Additionally, visitors must obtain and carry campfire permits.

1973 Park reports 12 1,000 backcountry overnight visits. Managers describe backcountry camping areas as resembling frontcountry campgrounds with no privacy and exhibiting significant resource impacts.

1974 Backcountry overnight-visits surpass 120,000 again. The designated site policy is replaced by a policy of dispersed camping. New regulations require visitors to camp out-of-sight of trails and other groups, to obtain backcountry camping permits, and prohibit campfires.

1975 Congress signs Public Law 93-622 authorizing Wilderness designation in the eastern U.S. (referred to as the Eastern Wilderness Act).

Recent Resource Protection

1976 Congress designates 79,019 acres of wilderness area in SNP, with 560 acres of potential additions also identified. As part of wilderness designation, Big Run shelter is removed from the backcountry, as are all man-made water developments except those predating the park. West Virginia University conducts a sociological survey of backcountry campers.

1977 West Virginia University conducts a trail user study in SNP. Overnight camping banned in portions of Limberlost, Hawksbill, and Whiteoak Canyon areas.

1978 SNP wilderness area expanded to 79,579 acres. Park reports 75,000 overnight backcountry visits.

1979 Three shelters along the AT are opened as PATC managed "huts" for long distance hikers on a trial basis. The hut system is expanded during the next two years to include seven huts along the AT for long distance hikers.

1981 SNP reports 61,000 overnight backcountry visits. A backcountry campsite inventcry and rehabilitation effort begins.

1983 Backcountry campsite inventory and rehabilitation program ends. Approximately 1200 campsites are located and assessed.

1984 Backcountry Management Plan completed.

1987 Superintendent Bill Wade begins service. Park reports 38,000 overnight backcountry visits.

1992 Campsite inventory and monitoring program initiated. Approximately 700 campsites are located and assessed.

1994 Draft BWMP is completed, public and in-house review accomplished. NRPP proposal including substantial funding for BWMP implementation is approved.

1997 Superintendent Doug Morris begins service.

1998 BWMP final draft completed. Environmental Assessment and final draft released for public review.

I.3 Backcountry Vision Statement

Shenandoah National Park's backcountry encompasses a significant segment of the Blue Ridge mountains, where natural features and processes and existing cultural resources are protected from human intervention; where modern human use is subserviant to, and enjoyed because of, the natural processes; where only the most essential and least intrusive human facilities are allowed. The visitor has a sense of being in a special place, is physically challenged to explore the terrain, and develops an appreciation of the natural forces which existed and shaped the land prior to human Settlement.

1.4 Backcountry Management Goals

Reasonable efforts shall be made to:

1. protect and perpetuate the evolving ecological system and processes critical to the native flora, wildlife, water quality, geologic features, and scenic values of the backcountry;

2. prevent human-caused degradation of cultural resources found in backcountry areas and protect identified significant examples of Appalachian culture and previous human use in what is now defined as backcountry;

3. provide the opportunity for the backcountry visitor to enjoy backcountry dependent unstructured recreational and "re-creational" experiences in an eastern deciduous forest setting;

4. strive for efficient and effective management techniques that do not sacrifice the quality of backcountry resources or backcountry experiences; and

5. preserve wilderness quality and values in the spirit of the Wilderness Act of 1964.

Additionally, as directed by the Government Performance and Results Act (GPRA, see chapter 3.6) these goals are encompassed by SNP Mission Goal 2 which states:

> Visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services and appropriate recreational and "re-creational" opportunities.

Several quantifiable long-term goals for backcountry management are established under this Mission Goal and are identified in chapter 3.6.

1.5 Backcountry Defined

Backcountry in Shenandoah National Park is defined as the primitive, undeveloped portions of the Park, managed primarily for natural conditions and processes. Facilities and/or cultural resources surrounded by backcountry are part of the backcountry. The Skyline Drive historic zone and associated developed zones are specifically excluded.

Designated wilderness areas are located within and are part of the Park's backcountry.

1.6 Wilderness Designation

In October 1976, Congress enacted Public Law 94-567, which designated nearly 80,000 acres of SNP as wilderness area. Wilderness classification mandates that specific areas of the Park be managed with special consideration for human impacts to the natural environment and visitor recreation opportunities.

The Wilderness Act of 1964 (P.L. 88-577) declares it to be the "policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness". It legally defines wilderness: "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.. . " and as ". . .an area of undeveloped Federal land retaining its primitive character and influence, without permanent improvements". The Wilderness Act states that such areas are to be "…protected and managed so as to preserve" [their] "natural conditions", and that wilderness must have "…outstanding opportunities for solitude or a primitive and unconfined type of recreation". It indicates that the areas must be ". ..of sufficient size as to make practicable its preservation and use in an unimpaired condition".

In an extension of the Wilderness Act, the "Eastern Wilderness Act" of 1975 (P.L. 93-622, authorizing eastern wilderness areas) more clearly defines the intended purpose and use of wilderness areas: ". ..areas...shall be managed to promote and perpetuate the wilderness character of the land and its specific values of solitude, physical and mental challenge, scientific study, inspiration, and primitive recreation. "

SNP wilderness management philosophy and policy are examined in chapter 5; specific wilderness management objectives are stated in chapter 4. The historical perspective of SNP wilderness designation can be found in former Superintendent Jacobsen's collection of articles entitled "The Management of Wilderness of Shenandoah National Park."

CHAPTER 2
DESCRIPTION OF THE BACKCOUNTRY RESOURCE

2.1 Physical Description of the SNP Backcountry Resource

SNP's backcountry includes approximately 196,000 acres. Nearly all areas of the backcountry are returning to forested conditions from substantial human habitation and land use which occurred up until the early 1930s when the park was established. Traces of the mountain culture are still quite evident in the backcountry and are described later in this chapter.

Backcountry topography is typical of the Appalachian mountain range with steep ridges and numerous stream drainages fed by mountain springs and precipitation runoff. Streams vary in size, but are typically small with frequent cascades and waterfalls. The ridges are characterized by thin, rocky soil and exposed rock formations. Elevations ranging from approximately 500 to 4,000 feet create a diverse ecosystem resulting in a wide variety of native flora and fauna. Vegetation is eastern deciduous forest type and seasonally dense. White-tailed deer, black bear, bobcat, wild turkey, ruffed grouse, and other woodland wildlife abound. A detailed description of park backcountry natural resources can be found in the Park's RMP.

The backcountry includes 79,579 acres of legislatively designated wilderness area comprising 40.6% of the park's total acreage. These areas do not include facilities or roads and include primitive trails as the only development. Wilderness boundaries are not physically identified in the backcountry except by large rock barriers placed on former fire roads to prevent motorized vehicle entry.

Approximately 116,000 acres of the backcountry is non-wilderness. Facilities in the backcountry include cabins and huts operated and maintained by the PATC as overnight lodging and a few day-use shelters maintained by the NPS. Most backcountry facilities are located in the Central District. Camp Hoover, a former presidential retreat, is now rarely used as a conference and special activities facility and is actively interpreted to visitors during the summer months. White Oak cabin is sometimes in use as a ranger residence. Structural remains of past mountain culture are located throughout the Park. These remnants are generally not maintained and are subject to natural weathering forces. Other development includes powerlines, gaslines, radio/microwave antennas, and gravel administrative roads. Backcountry facilities are described in chapter 6.

The primary backcountry development is in the over 500 miles of hiking and horse trails. This vast network of trails allows for many circuit hike possibilities and provides backcountry users with a variety of challenges and opportunities. Park trails can be accessed from the park boundary or Skyline Drive. Many trails exist on former mountain roads which twist and wind up ridges and down drainages. The nationally designated Appalachian Trail (AT), which traverses the Appalachian mountains from Maine to Georgia, follows the crest of the park parallelling and often crossing the Skyline Drive for 95 miles. Attractions for many backcountry users include scenic vistas, numerous small streams and waterfalls, wildlife viewing, nature study, and solitude.

2.2 Description of SNP Backcountry Recreational Activities

Numerous backcountry recreational opportunities are available at SNP. These opportunities depend primariiy on the Park's natural resources and the extensive trail system. Backcountry recreation management is discussed in detail in chapter 9. Of all the past visitor surveys conducted in the park, a 1989 Park concessioner marketing research study (ARA Virginia Skyline Company, Reid and Teer) indicated that most visitors (71%) staying in the park found hiking to be a very important part of their visit.

To many visitors, SNP's backcountry is a day use area in which to pursue hiking and nature study activities. However, the Park receives substantial overnight backcountry use. Primitive camping is permitted in the backcountry but visitors must obtain a free backcountry camping permit at designated park facilities or from self-registration stations. Park regulations and trail use information are conveyed or posted at each permit station.

Horseback riding is a popular activity and a number of trails are designated for horse use, which is restricted to these trails. Short, guided day trips are available seasonally with the park concessioner.

Bicycle use, including mountain bikes, is restricted from the backcountry.

Shenandoah's numerous mountain streams provide some of Virginia's finest native brook trout fishing. "Catch and Release" recreational fishing is permitted parkwide, with some streams designated as "closed" to fishing and others designated as regulated "open for harvest" fishing, from which fish may be kept subject to size and creel limitations.

Rock climbing in the park is increasing in popularity. Numerous exposed rock cliffs, particularly in the Old Rag Mountain area, attract technical and free climbing enthusiasts. Presently, climbing is not specifically regulated. This BWMP recommends that a rock climbing plan be developed to manage impacts associated with this activity.

Cross-country skiing in the park is limited by available winter snow cover. Snow cover varies widely from year to year and by elevation; historically, snow cover is frequently inadequate to support cross-country skiing. However, with sufficient snow this can be a highly enjoyable and popular backcountry use opportunity on park trails and service roads. Trails are not maintained for cross-country skiing and this activity is not regulated.

Hang gliding is restricted to three backcountry launch sites in the park near the Skyline Drive and a fee is required to obtain a special use permit. It is the responsibility of the user to identify and obtain landowner permission for landing sites outside of the park. Landing within the park is not permitted. Hang glider activity is infrequent.

All plants and animals are protected in SNP. The collection of artifacts and relics is also strictly prohibited. However, it is permissable to pick fruiting bodies (ie. fruits, nuts, mushrooms) for personal consumption. These seasonal foraging activities add to the ranks of day users during

the "harvest" seasons, especially during the April/May morel (mushroom) season.

2.3 Description of Backcountry Visitor Use and Impacts

Visitor Use Demographics:
In 1996, SNP received 1.6 million visits and approximately 46,727 visitor overnight stays (visitor nights) in the backcountry were recorded. Although the backcountry receives substantial day use, there are currently no accurate means for estimating this use. Backcountry visitor use at the park varies widely depending on accessibility and popularity of individual areas. Backcountry use generally follows park visitation patterns. Visitor use is seasonal and cyclic; November through February are consistently low-use periods while July, August, and October are high-use months. These three months constitute nearly 50% of the park's annual visitation. The intensity of use in October indicates the drawing power of the spectacular autumn leaf color display. Fair weather weekends are peak periods and visitation is usually increased on holiday weekends.

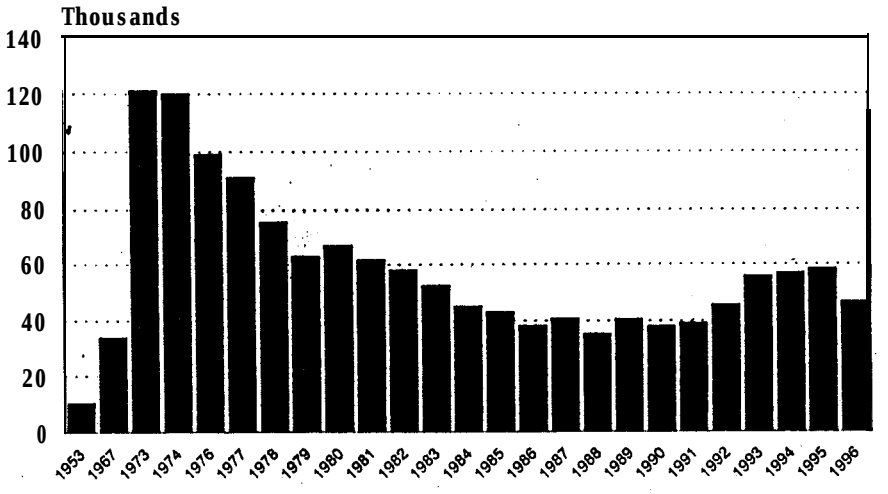
While the Park draws visitors from all over the United States and foreign countries, according to backcountry camping permit data recorded in 1992, 80% of the backcountry overnight visitors came from Virginia, Maryland, Delaware, New Jersey, Pennsylvania, and New York. Overnight backcountry use was particularly regional with 37% of users being from the Washington, D.C. metropolitan area (less than 80 miles from two main park entry points) and 16% from the Richmond metropolitan and Tidewater areas (within 60 to 120 miles of the Park). Notably, visitor use from the Washington, D.C. area was significantly decreased from 57% of 1991 backcountry overnight visitors.

Backcountry camping statistics, derived from permit data, are summarized in Table 2.1.

Table 2.1

Overnight Backcountry Visits to SNP

1953-1996



Backcountry camping at the Park rose from approximately 34,000 visitor nights in 1967 to a peak of 121,000 in 1973. Backcountry camping declined through the 1970s and 1980s to approximately 75,000 in 1978 and to 39,000 in 1992. Overnight visits increased from 39,000 in 1992 to 58,000 in 1995, Visitor nights decreased to 47,000 in 1996, possibly due primarily to Tropical Storm Fran severe impacts to backcountry trails and boundary access conditions in September through the remainder of the year. Although historical data is not available, characteristics such as group size (averaging just over two persons/party), length of stay (averaging just over one night), and campsite location appear to have remained fairly constant through the years. Certain locations, particularly stream and viewpoint areas, are more popular for camping than others and overnight use is only moderately dispersed.

Visitors to the backcountry vary widely in recreational interests, experience, skill, and demands. The preferences and characteristics of backcountry visitors must be considered to provide a diversity of safe and enjoyable backcountry experiences. As an important step in the Limits of Acceptable Change planning process, a comprehensive backcountry social inventory is required so that sociological interrelationships can be documented and managed. Results from the 1976 West Virginia University survey concerning the preferences of backcountry campers and a 1977 trail user survey will be used in the interim. These surveys provide some insight to backcountry user preferences and use patterns. A strategy of this BWMP is to provide opportunities for these preferences managed accordingly to minimize impact to the Park's natural resources.

The West Virginia University survey identified the following recreational attributes, ranked in declining order, for an enjoyable camping experience:

Table 2.2

(1) solitude while camping
(2) selection of personal campsites
(3) solitude while hiking
(4) undisturbed campsites (no evidence of previous use)
(5) campfires
(6) meeting other backpackers
(7) contact with park personnel
(8) permanent shelters
(9) developed campsites

Information provided by the 1977 trail user survey indicated that:

Table 2.3

(1) 67 % of backcountry use occurs on weekends
(2) about 50% of parties consist of two people
(3) 25 % of users are on their first visit to the park
(4) 33% of trail users reported that hiking was the primary purpose of their visit, 19% reported camping, and 14% reported sightseeing
(5) 25 % of users selected a trail because -of an' outstanding feature'
(6) 50% of users were hiking the trail in a two-way direction, 26 % were going one way (using another trail to complete a circuit)
(7) 20% of users were hiking approximately three miles, 57% eight miles or less
(8) 40% of users planned to hike less 'than six 'hours with half of these planning only a two to three hour hike
(9) 5 % found the backcountry crowded, 40% did not (expectedly, weekenders perceived the park to be more crowded than did weekday users).

Notably, hikers on the Whiteoak Canyon trail, one of the most heavily visited areas in the park, expressed feelings of crowding to a lesser degree than the average park visitor.

Although use statistics are unavailable, horseback riding appears to be increasing significantly. Nearly all horse use is day use, although overnight camping is permitted. Most horse use is by visitors who live near the park and is often sponsored by local horse clubs or other recreation organizations. Outfitter/guide operations use park trails infrequently and are authorized only by a commercial license.

Fishing is a seasonally oriented activity with the heaviest use occurring in April and May. Park regulations restrict anglers to artificial lure and fly fishing techniques. The challenge of fishing the small and often remote park streams and the attraction of some of Virginia's finest native brook trout attracts a very serious and dedicated group of anglers from a wide area.

Most fishing and horse use appear to originate from park boundary access points. Boundary entry by visitors is significant and trends in visitor use are monitored by electronic trail counters and/or voluntary trail registration boxes. The boundary entry aspect of visitor use measurement is discussed in chapter 13.

Visitor Use Impacts

Backcountry resources are impacted directly and indirectly by visitor use and park management activities. A wide variety of ecological and human factors determines the scope and magnitude of this impact and affects our ability to successfully manage resource damage. Compared to many other NPS backcountry environments, SNP is relatively resistant to long-term serious impact. A moderate'climate with ample rainfall, good soils, and a long growing season produce

vigorous and diverse plant communities with good regenerative qualities. However, the level of constant and intense impact has, in many cases, exceeded the natural ability of the resource to resist or recover from overuse. SNP managers must not rely on the regenerative qualities of the plant communities but should manage to avoid the impacts of overuse. The impacts of visitor use and Park management actions on vegetation, soils, wildlife, air and water quality, cultural resources, and wilderness and solitude are examined in the BWMP Environmental Assessment, located in the Appendices at chapter 16.1.

2.4 Natural and Cultural Aspects of Resource

The existing SNP Resource Management Plan was approved in 1991 and has been updated continuously through the present time, providing a comprehensive description of park natural and cultural resources. The following is a general and summary description of Park resources based on the RMP "Genera1 Resource Description" chapter,

Natural Resources

Geology

The Blue Ridge Mountains of SNP are a part of the Appalachian physiographic region. The Park is bounded on the east by the Piedmont plateau and on the west by the Shenandoah Valley. The mountains are dissected by streams of varying sizes and the mountain crests contain many rocky cliffs, rock outcrops, and talus and scree slopes.

The geology of the section of the Blue Ridge Mountains located within the park is one of the most outstanding natural features of the area. The exposed formations are among the oldest in North America. The geologic history of the park is the subject of frequent investigations by both eminent geologists and university students. Seven principal rock types form the bedrock of the area, including granitic types (Old Rag granite and Pedlar formation), granitic and volcanized conglomerate types (Swift Run formation), metamorphosed volcanic types (Catoctin formation), and metamorphosed sedimentary types (Weaverton, Hampton, and Erwin formations).

Flora

SNP contains one of the nation's most diverse botanical reserves. The documented flora of the park includes nearly 1,400 species of plants, many of which are found along the forest edge, on exposed rocky mountain summits, and in meadow or bog areas. The eastern deciduous forest here is located in a transitional zone between northern and southern vegetation, so that higher elevations and/or north-facing slopes are often dominated by northern species, while lower elevations or more southerly slopes contain species representative of a central hardwood forest. Because SNP is located in this transitional zone, many plants exist in the park either near the northern or southern terminus of their natural range. Several of these are known to be glacial relics, species that survived the Pleistocene Ice Ages in the Blue Ridge Mountains. They persist at high altitudes, in bogs, or where special climatic features exist.

Seven primary forest types are classified as the following in order of prevalence: chestnut oak, yellow poplar, cove hardwood (consisting of ash, red oak, and basswood), Red Oak and associates, pine (consisting of eastern white pine, Virginia pine, and pitch pine), black locust, and hemlock. The richest and most diverse forest type, occupying hollows or coves occurring in valley bottoms along the mountain slopes, is the cove hardwood forest. This last habitat is considered optimum for plant growth.

The park contains some unusual botanical areas. The Big Meadows Swamp is a true wetland and contains a wide variety of water dependent flora and fauna. Many of the plants on the park's list of rare and endangered species are found only in the Big Meadows Swamp. Other mountain bogs occur at the headwaters of streams and at seeps and contain unusual and rare botanical species. Cliffs and rocky slopes in the park are mostly north- and west-facing areas that support fragile populations of plants, some of which are tundra varieties. A description of unusual botanical areas and the unusual flora and fauna species found within them is provided in A Natural Heritage Inventorv of Mid-Atlantic Region National Parks in Virginia: SNP (Ludwig et al, 1993). Relevant to the BWMP, this "Natural Heritage Resources" report includes in its summary recommendations: ". . . Incorporate natural heritage resource area information in the planning, management, and maintenance documents of SNP.. . . " Some of the information has been incorporated into this BWMP, but study will be required to further address the impacts of the report on SNP backcountry management.

Fauna

Those who explored the Shenandoah Valley and Blue Ridge Mountains in the early 1700's described an abundance and variety of animals. As European settlers cleared the land, exotic species were introduced and the abundance and variety of hunted native animals decreased. A number of native species disappeared, while the populations of many other species decreased. Through the 20th century many animal species were eliminated. White-tailed deer were nearly eliminated by the 1920's and populations of black bear, turkey, elk, and bobcat were reduced substantially.

Since establishment of the park in 1935, some extirpated species have been successfully reintroduced into the recovering forest, and some have recovered without human assistance. Deer were released in the park in 1934 and additional deer entered the park from the Massanutten Mountains in 1938. The deer herd increased gradually and now is roughly estimated at a total park population of about 6,000 animals. Turkeys were reintroduced in 1934 and were introduced on private adjacent lands in the 1950's. Wild turkeys have become a common species, having multiplied to fill all available habitat. Black bear re-established naturally as the land became reforested. In 1989, following an extensive research period, the black bear population was estimated at over 300 animals and now appears to be stabilized. Bobcats are now common in the park, however the number and distribution of this species is unknown.

The opossum, raccoon, skunk, gray fox, and eastern cottontail are other more commonly seen mammals in the park. Over 200 species of resident and transient birds are known to use the park's habitat. A large diversity of reptile and amphibian species exists at SNP and includes 6

species of turtles, 3 species of lizards, 23 species of snakes including 2 poisonous species (timber rattlesnake and copperhead), 17 species of salamanders, 3 species of toads, and 10 species of frogs. In 1989, the Shenandoah salamander was listed as an endangered species. The Peregrine Falcon was reintroduced to the Hawksbill area in 1989 and successful nesting has occurred in the mid-1990's.

Twenty-two species of fish have been recorded in park waters. Of the approximately 90 small streams in the park, 46 are classified as brook trout streams.

Cultural Resources

History of the Area

The story of SNP reveals a continuous interaction between land and people for over 9000 years. Archeological evidence indicates that as early as 8000 B.C., paleo-indians were using the Blue Ridge Mountains. These people were hunters and gatherers who lived in seasonal camps in the mountains. By 1000 A.D., agricultural communities had developed in the surrounding valleys, and use of the mountains was limited to short hunting trips.

The first European to record any exploration of this part of the Blue Ridge was Dr. John Lederer. In 1669, Lederer climbed to the crest of the mountain and described a wild forest teeming with game and a large open area which may have been Big Meadows. In 1716, the Colonial Governor of Virginia, Alexander Spotswood, led a celebrated expedition across the mountain to encourage settlement of the surrounding valleys. During the 18th century, people moved into the Piedmont from the Tidewater region and into the Shenandoah Valley from Pennsylvania. By 1800, settlement of the valleys was fairly complete and the lower ends of the mountain hollows were being occupied. During this period, the native Americans living in the area disappeared completely, or moved elsewhere.

During the 19th century, settlement progressed into the mountain hollows as available land in the lowlands became scarce. The mountain culture became a reflection of society throughout the area, with numerous small industries (grist and saw mills, charcoal manufacturers, tanneries, quarries, and forges) located along the many waterfalls producing waterpower and on the roads that crossed the ridge at the gaps. Stores and churches grew up around these small industrial coomunities. Although flat land for large agricultural operations was scarce, the hilly slopes were idea for the grazing of cattle in the warm months and for the establishment of orchards. For those living high up the mountains, steep, rocky slopes, thin soil, and severe climate kept mountain farming to bare subsistence level, and income was often derived from day labor in the Valley, the Piedmont, or later, at Skyland. At the turn of the century as technology shifted from water power to the use of the steam engine, small industries near the base of the mountain began to fail or move away. The mountain population reached it's peak about 1900. It began to decline until the 400-500 families living in the hollows in 1930 were estimated to be half of what were there 30 years before.

SNP was authorized by Act of Congress in 1926. It provided for establishment of a park with

no expenditure of Federal funds for land purchase. Over a period of ten years, private donations and a major expenditure by the Commonwealth of Virginia secured. the land necessary to officially establish the national park in 1935. In the meantime, the now-famous Skyline Drive was funded as a drought relief measure, and construction began in 1931. In 1933, the Civilian Conservation Corps (CCC) established the first of ten camps managed by the park. The CCC constructed most of the facilities necessary for visitor services, planted tens of thousands of trees and shrubs along the Skyline Drive, conducted vegetative surveys of all park lands, corrected signficant erosion problems created by the construction of the Drive, and expended thousands of labor days on the eradication of exotic plants and pine bark blister rust. Of the people still living on the mountain, many sold their land to the Commonwealth and moved out on their own, while the remainder were evicted and, in some cases, sold farms in the resettlement camps outside the park.

The prevailing philosophy at the time the park was established was that any evidence of human occupation in the "natural area" was a blight on the landscape, in spite of direction from the Secretary of the Interior and Director, National Park Service, that significant historic structures were to be preserved. As a result, many of the buildings in the park were demolished and practically all of those that remained have been allowed to melt into the landscape. Today, very little of the material remains of the mountain culture or border industries exist above grade. Concern for cultural resources in recent years led to passage of the National Historical Preservation Act of 1966 (with amendment) and Executive Order 11593. NPS policies on cultural resources, as specified in Chapter 5 of the "NPS Management Policies" and the "Cultural Resources Management Guidelines (NPS-28)," were subsequently developed. Park managers are now required to survey, evaluate, and as necessary, protect cultural resources in the park.

Historic Sites and Structures

A number of cultural sites are located in the backcountry. Archeological studies have indicated extensive prehistoric human occupation of the Blue Ridge from the Early Archaic to late Woodland Periods. Some of these surveyed sites have been entered on the National Register of Historic Places and as such receive protection from development, overuse, and vandalism so that the subsurface artifacts and general integrity of the sites will remain intact. The General Management Plan (GMP) identifies these sites and historic structures eligible for the National Register of Historic Places. However, recent National Register studies and initial archeological surveys in Nicholson, Weakley, and Corbin Hollows indicate that many more sites within the park are nationally significant. Camp Hoover has been placed on the Register as a National Historic Landmark and Corbin Cabin has been determined eligible as a historic site. All of the PATC administered cabins, PATC maintenance huts, and shelters are believed eligible for the Register. Skyline Drive and the corridor 150' on either side as well as the developed areas at Dickey Ridge, Piney River, Pinnacles, Headquarters, Skyland, Big Meadows, Lewis Mountain, and Simmons Gap are now determined as National Register historic districts. The open area at Big Meadows has been identified as a significant cultural landscape because of its early identification and apparent unnatural condition.

The GMP also identifies historic structures in the park that do not warrant active preservation.

These include homesites, former mills, cemeteries, mines, and church and hotel sites. The historic structures or sites described in the GMP will have to be studied and determinations of eligibility prepared to assess their historic value. Most structures exist only as ruins and unless determined significant by the evaluation process will be allowed to melt into the landscape.

Traces

The backcountry visitor might observe much evidence of structures and other signs of past mountain culture which are being allowed to "melt into the landscape." These traces of prior human habitation exist in various forms: an extensive network of abandoned roads reclaimed by natural forces or impressed into service as trails or administrative roads; deteriorating rock walls, decaying split chestnut rail fences, and rusty wire fencing which defined property lines and fenced in or out farm animals; rockpiles in the wilderness created when the mountain people cleared their fields to farm crops; decaying automobiles or miscellaneous objects ranging from plowshares to pots, pans, and glassware discarded in long-ago dumps; some forgotten and other still-maintained cemeteries; the occasional and somewhat displaced stone chimneys looming out of the underbrush; old homesite building foundations and other associated "disturbed areas"; the unexpected bloom of blue flag iris or lilac and multitudes of other "exotic" garden plants: and the list goes on. This special aspect of the SNP backcountry makes its exploration and study all the more fascinating.

Future Actions:

A. Review and incorporate natural heritage resource area information and recommendations from the Natural Heritage Resources report into the BWMP.

B. Incorporate future archeological assessment and overview information into the BWMP.

CHAPTER 3
INTEGRATING BACKCOUNTRY MANAGEMENT INTO SNP PLANNING

3.1 Reference to Legislation and NPS Management Policies and Guidelines

The NPS Organic Act of 1916 (39 Stat. 535, 16 USC 1) established the NPS, directing it to:

> promote and regulate the use of the Federal areas known as National Parks, Monuments, and Reservations . . . by such means and measures as conform to the fundamental purpose of the said Parks, Monuments, and Reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

Clearly Congress intended park visitation to be contingent upon the ability of the NPS to preserve park environments in an unimpaired condition. What constitutes an "impaired" resource is ultimately a management determination. Similar language is used in the Wilderness Act of 1964 (16 USC 1131-1136), applicable to parks with designated wilderness areas within their boundaries. Wilderness areas:

> shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness...

Authority for implementing Congressional laws is delegated to agencies, which identify and interpret all relevant laws and formulate management policies to guide their implementation. For the NPS, these policies are set forth in a document titled Management Policies, revised in 1988. These policies provide direction for management decisions and adherence is "mandatory unless waived or modified by an appropriate authority."

Several statements in Management Policies specifically require and guide the development of planning documents which address backcountry and wilderness management:

> Backcountry use will be managed to avoid unacceptable impacts on park resources or adverse effects on visitor enjoyment of appropriate recreational experiences. The National Park Service will identify acceptable limits of impacts, monitor backcountry use levels and resource conditions, and take prompt corrective action when unacceptable impacts occur. Management strategies designed to guide the preservation, management, and use of the backcountry and to achieve the park's management objectives will be integrated into the park's backcountry management plan. (Chapter 8:3)

and,

> The superintendent of each park containing wilderness will develop and maintain a wilderness management plan to guide the preservation, management, and use of that wilderness. This plan may be developed as a separate document or as a action component of another appropriate management plan, such as the general management plan or backcountry management plan.. . The plan will be developed with public involvement and will contain specific, measurable management objectives that address the preservation of wilderness-dependent cultural and natural resources and values in order to achieve the public purposes specified by the Wilderness Act and other appropriate legislation. (Chapter 6:4)

Specific mention is made in the Management Policies and in the Natural Resources Management Guideline (NPS-77) to the Limits of Acceptable Change (LAC) model as a planning framework for such planning efforts. Such plans "will establish indicators, standards, conditions, and thresholds above which management actions will be taken to reduce impacts" (Management Policies, Chapter 6:5). Planning models such as LAC are designed to facilitate the balancing of visitor use with the protection of park resources and impacts to other visitor and park uses.

Management Policies also recognizes and authorizes the need for park zoning:

> The general management plan will prescribe a system of management zoning for park lands and waters to designate where various strategies for management and use will best fulfill management objectives and achieve the purpose of the park. The delineation of management zones will be based on an evaluation of the congressionally established purposes of the park; the nature of the park's natural and cultural resources; all past, existing, and anticipated uses; and park management objectives. This prescriptive zoning will consider the capability of lands to support identified uses and will be used as a framework for specific planning and management decisions on use and development of the park. (Chapter 2:7)

NPS-77 specifically recognizes and authorizes the use of management zoning in backcountry management plans:

> The wide diversity of resource opportunities and settings found in parks provides the opportunity for a broad segment of the public to pursue the particular recreational experiences they are seeking. These recreational use opportunities are defined by various physical, biological, managerial, and social conditions... One common technique for preserving this diversity of high quality experiences is the stratification of use levels through zoning. In developing backcountry use management plans, zoning has proven useful as a means of achieving management objectives and. providing different experiences for satisfying various user demands. Managers may want to establish different recreational use zones ranging from areas with high concentrations of use to pristine areas with very little use. (Chapter 3:75)

3.2 Reference to General Management Plan (GMP)

SNP's 1983 GMP provides a "10- to 15-year blueprint of programs and facilities for continuing the mission that started at Shenandoah National Park over half a century ago." The GMP prescribes comprehensive programs for park preservation, interpretation, visitor use, development, and administration.

The GMP states that the park's primary management goal is to continue providing diverse recreational opportunities that are compatible and commensurate with the resources present, so that the use and enjoyment experienced by visitors since establishment of the park is perpetuated. In the context of backcountry and wilderness management this plan describes land protection, natural and cultural resources protection, visitor use management, general development, management zoning, and roads and trails development. Of particular significance to the park's backcountry and wilderness management is its reference to management zoning, which permits the designation of zones in the backcountry to guide management of conforming uses and development. Each zone is identified by "Management Zoning Plan" maps, where "appropriate uses" and "permitted development" are described. The GMP's zoning strategy both supports and guides the "opportunity class" management zoning recommended in this Backcountry and Wilderness Management Plan.

Management alternatives and possible impacts which relate to backcountry management are presented in more detail in the 1981 Environmental Assessment for the General Management Plan.

3.3 Reference to Resource Management Plan (RMP)

The RMP is a continually evolving broad action plan developed to provide direction and continuity and to establish priorities for the protection and preservation of park natural and cultural resources. The RMP lists backcountry and wilderness management as a specific program area included in strategic planning to protect and perpetuate the natural resources of SNP. Numerous natural and cultural resource project statements described in the RMP relate to backcountry/wilderness management. Specific backcountry/wilderness topics in 1997 include: "Manage Backcountry and Wilderness (SHEN-N-030.001)"; "Implement BWMP (SHEN-N-030.002)"; "Conduct Visitor Use Survey/Old Rag (SHEN-N-030.003)"; and, "Regulate Backcountry Use and Mitigate Human Impacts (SHEN-N-03 1 .000)" including "Implement BWMP (SHEN-N-031 .001)", "Trail System: Management and Maintenance (SHEN-N-03 1.002)", and "Boundary Survey/Marking (SHEN-N-03 l-003)."

The RMP includes descriptions of the various resource management programs. The backcountry and wilderness management program description defines the scope of the Backcountry and Wilderness Management Plan, a sub-document of the RMP, as follows: "This program is directed by the objectives and actions described in the Park's Backcountry/Wilderness Management Plan. This plan contains the long-range program directed at maintaining the proper balance between visitor use and the protection of backcountry resources and wilderness values.

Many of the elements of the other program areas are carried out in the backcountry and are therefore related to this program. The primary objective of the backcountry and wilderness management program is to identify what research, monitoring, protection, and mitigation activities are necessary to meet the stated objectives. Backcountry operations will continue to be a high priority activity."

Specific program areas for which park action plans related to backcountry operations have been developed include the Bear Management Plan, Deer Management Plan, Fisheries Management Plan, Gypsy Moth Integrated Pest Management Plan, and the Wildland Fire Management Plan. The relationship of each of these action plans to backcountry operations is as follows:

A. Bear Management Plan: This plan addresses those management concerns affecting the black bear population and its interaction with people. This program directly affects backcountry management and visitor use when it becomes necessary to close trails or restrict use in a given area because of conditioned or aggressive bear behavior. Criteria for area restrictions and closures are defined in the Bear Management Plan. Other backcountry concerns covered in this plan are the impacts of backcountry users on bear behavior, critical black bear life periods, habitat critical to the perpetuation of a healthy bear population, and the handling of "problem" bears in the backcountry.

B. Deer Management Plan: This plan addresses those management concerns affecting the white-tailed deer population and its interaction with people. In backcountry areas the deer population is to be regulated by natural processes to the greatest extent possible. Human interaction with the deer population is much more of a concern in the frontcountry where "tame" deer need to be managed to reduce hazardous interactions.

C. Fisheries Management Plan: This plan addresses those management concerns affecting the native brook trout population. The plan addresses environmental impacts on streams and the human impact of fishing pressure affecting the health of the brook trout population. Fishing is the only consumptive use of wildlife resources permitted in the park. The plan describes this use in keeping with sound natural resource management principles to assure the health of the aquatic ecosystems.

D. Integrated Pest Management Plan: This plan addresses management concerns related primarily to gypsy moth impacts on the historic and natural resources as they affect visitor use and enjoyment of the park. The plan focuses on protection of historic and developed areas from excessive tree defoliation and tree mortality. Backcountry operations might be affected by hazard tree risks to backcountry visitor safety or protection of sensitive natural areas and facilities by application of biological or chemical agents to control the Gypsy Moth.

E. Wildland Fire Management Plan (FMP): This plan is the guiding document for fire management activities within the park. "Fire Management Units" (FMUs) have been established which identify fire management strategies to be used to achieve different fire management objectives according to the natural, cultural, and human resources involved

in park areas. Two different fire management units have been established for the park, using zones defined in the GMP. The park's backcountry lies primarily in the "FMU 2 - Natural Zone" where "all fires will be suppressed, regardless of cause, in the most effective manner possible while minimizing unwarranted resource damage." The few historic areas located within backcountry are included in the "FMU 1 - Developed and Historic Zone" where "all fires will be suppressed, regardless of cause, in the quickest, most effective manner possible." The FMP details specific fire management goals and strategies for fire suppression for each unit. It also describes minimum impact suppression tactics and rehabilitation actions to protect natural and cultural resources.

According to the FMP, human-caused fire ignitions at the park account for 85% of all the historic fires. The FMP describes policy and programs to deal with the continuing high potential for human-caused fires. The most heavy weekend backcountry use periods of April, May, and October coincide in part with the park's established fire season of mid-March through mid-May and mid-September through mid-December. During periods of high fire danger, all or portions of the backcountry may be closed to or restricted from visitor use.

3.4 Reference to Emergency Operations Plan

The SNP Emergency Operations Plan guides operations such as wildfire suppression, extended search and rescue missions, aircraft disasters, and other emergencies which may have an impact on the park's backcountry. When for reasons of public safety or the orderly management of emergency operations, regulation of visitor ingress and movement through the backcountry may be desirable. Authority to close all or portions of the backcountry to visitor use exists in Title 36, Code of Federal Regulations section 1.5 (closures and public use limits).

Existing rules and regulations for the use of the backcountry, including but not limited to camping and fire regulations, the use of aircraft or other mechanized equipment (including use in designated wilderness areas, see chapter 5), and use limits, may be administratively waived during the course of the emergency, and when deemed necessary for the orderly management of the specific operation. All deviation from existing policy and regulations must be approved in writing by the park superintendent. However, minimum impact techniques will be used to the extent possible and practical. Emergency incidents which occur on or near the AT often have implications for other areas of the Trail and should be reported promptly to the AT partners (see Chapter 3.5) so that accurate information is distributed to Trailwide managers and hikers.

3.5 Reference to Appalachian Trail Management Plans

The National Trails System Act (NTSA, P.L. 90-543, as amended) designated the Appalachian Trail as one of the nation's first two national scenic trails. In 1978, the NTSA was amended by Public Law 95-625, which is frequently refered to as "the Appalachian Trail Bill." Public Law 95-625 directed the Secretary of the Interior (in consultation with the Secretary of Agriculture) to develop and submit a comprehensive plan for the protection, development, use, and maintenance of the Appalachian Trail. In 1981, the Director of the NPS and the Chief of the

USDA Forest Service approved the Comprehensive Plan for the Appalachian Trail.

According to the Comprehensive Plan for the Appalachian Trail,

> The Appalachian Trail is a way, continuous from Katahdin in Maine to Springer Mountain in Georgia, for travel on foot through the wild, scenic, wooded, pastoral, and culturally significant lands of the Appalachian Mountains. It is a means of sojourning among these lands, such that the visitors may experience them by their own unaided efforts. In practice, the Trail is usually a simple footpath, purposeful in direction and concept, favoring the heights of land, and located for minimum reliance on construction for protecting the resource. The body of the Trail is provided by the lands it traverses, and its soul is in the living stewardship of the volunteers and workers of the Appalachian Trail community,

The Comprehensive Plan describes the AT's approach. The plan states:

> The primary purpose of the plan is to provide Congress information it needs to meet its oversight responsibility for the Appalachian Trail. To some extent, therefore, the plan is a report on the progress achieved to date in the administration of the Trail. In addition, the plan provides an opportunity to organize the accumulated policy directions, guidelines and understanding about administration of the Trail for the benefit of the private, state, and federal partners in the Trail project.

and,

> The plan is intended to provide a framework for development and management of the Trail and its immediate environs. Detailed guidance for managers is provided by other documents.. .

The Comprehensive Plan for the Appalachian Trail describes a management system for the

partnerships among individual trail clubs and agency partners in a decentralized consultation and decision-making process. Management and maintenance of the AT in SNP is a cooperative effort of the Potomac Appalachian Trail Club (PATC), the Appalachian Trail Conference (ATC), the Appalachian Trail Project Office (ATPO), and SNP.

The PATC, which maintains the AT and many other trails within the park, is a nonprofit service organization dedicated to preserving the AT. Founded in 1927 by seven hiking enthusiasts whose dream was to create a 2,000-mile footpath from Maine to Georgia, PATC now has approximately 5000 members. The PATC's draft Management Plan for the Appalachian Trail, Rockfish Gap. Virginia to Pine Grove Furnace State Park. Pennsylvania (PATC, 1988) is currently being reviewed by agency partners and other interested parties. PATC also maintains a Memorandum of Understanding with SNP (see chapter 8.2).

The ATC, a nonprofit organization of approximately 24,000 members dedicated to protecting and promoting the AT, also serves as a federation for the 32 Trail clubs that manage and maintain the Trail in cooperation with their agency partners. ATC has provided Trail clubs with the Local Management Planning Guide, a comprehensive reference document to aid them in the process of local planning. This guide is used both as an active tool during the preparation and updating of a local management plan and as a permanent reference of current policies for management of the AT. ATC has also adopted standards for clearing, construction, marking, and maintenance of the AT, which are described in ATC's stewardship handbook, Trail Design, Construction, and Maintenance.

The ATPO, which is located in Harpers Ferry, West Virginia, is responsible for ensuring that the requirements of the NTSA for the protection and management of the AT are fulfilled. The Project Office and other park units are guided by the Appalachian Trail Comprehensive Plan in administering the AT.

A Memorandum of Understanding (MOU-2490-97-011) for the Appalachian National Scenic Trail within and adjacent to the park was signed in July 1997 by officials of the PATC, ATC, ATPO, and the SNP. This MOU documents the roles of the respective AT management partners, as well as each party's responsibilities for consultation and coordination prior to any actions that might affect the management of the AT.

Management objectives for the AT in SNP are described in chapter 4.2 of this plan. The role of PATC in SNP backcountry management is described in chapter 8.2, and AT and other trail maintenance standards are summarized in chapter 8.3.

3.6 Reference to Government Performance and Results Act

Performance management using the Government Performance and Results Act of 1993 (GPRA) guidelines establishes a means of routinely using performance management in daily operations. The NPS, and the entire Federal Government, is moving from an operational mode towards performance management using strategic planning to acomplish the NPS mission (NPS GPRA Brief).

According to the National Park Service Strategic Plan (1997), the NPS began work to comply with in 1995 to develop a useful performance management system which is required by GPRA to have both strategic planning and performance measurement, ie. setting goals and measuring results. The NPS Strategic Plan states:

> GPRA seeks to make the federal government more accountable to the American people in its actions and expenditures. The National Park Service, with its mandate to preserve natural and cultural resources and to provide access to the nation's parks and treasures, can and must demonstrate its value to the American people.

and,

> The agency has the opportunity now, for the first time in its history, working with the impetus of the Government Performance and Results Act, to develop a strategic plan for each national park system unit that explains why the unit exists. and what its mission is, what goals management and staff should be achieving to fulfill its mission, and how they might organize the human and fiscal resources to meet those goals within specific time frames.

Servicewide goals and performance measures have been set and strategic plans are developed by individual parks and programs that tier off the servicewide Strategic Plan and its goals.

Based on the Strategic Plan, SNP has developed “mission” and “vision” statements and, from the Strategic Plan’s four categories of servicewide mission goals, has developed six mission goals which enable the park to focus and align its activities, core processes, and resources to support mission-related outcomes. Mission goals articulate the ideals that the park is striving to attain. These are not quantifiable, but they provide the basis for quantifiable long-term goals. Long-term goals establish performance measures, help to develop reporting methods, and are generally written to be achieved in a five-year timeframe.

This BWMP, with its specific management objectives and established performance measures, is but one of the park processes driven by GPRA. The management of SNP backcountry and wilderness has relevance to all of the six SNP Mission Goals, but is specifically directed by Mission Goal 2 which states,

> Visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services and appropriate recreational and "re-creational" opportunities.

Long-term goals associated with Mission Goal 2 which relate most directly to issues addressed by this BWMP include:

2.1 By 2002, 70% of visitors surveyed are satisfied with their “visitor experience” as defined in a manner consistent with park purposes, significance and values.

2.2 By 2002, all changes to backcountry and wilderness resources caused by visitor behavior are within acceptable levels.

2.3 By 2002, 80% of visitors surveyed have basic information about park resources and opportunities.

2.4 By 2002, 80% of visitors surveyed are satisfied with the availability, accessibility, and quality of park facilities and services.

2.5 By 2006, park facilities are accessible and new projects demonstrate sustainable practices.

The **Backcountry Vision Statement** (chapter 1.3) and **Backcountry Management Goals** (chapter 1.4) reflect generalized SNP backcountry and wilderness management in philosophical terms consistent with GPRA management directives and goals.

CHAPTER 4
BACKCOUNTRY/WILDERNESS MANAGEMENT PLANNING FRAMEWORK

4.1 Introduction to Limits of Acceptable Change and Visitor Impact -Management (LAC/VIM) Frameworks

The Concept of Carrying Capacity

The central theme of this BWMP is the description and management of SNP backcountry recreation "carrying capacity. " The carrying capacity concept is generally used to identify the limits to the amount of use a resource can sustain for a given set of objectives. It is based on "change" and recognizes that any use of the resource results in change to the resource and to the social quality of the backcountry recreational experience.

Traditional models of carrying capacity are based on two assumptions: (1) increased use results in declining quality of recreational experiences or environmental quality, and (2) a determinable maximum value exists which represents the "capacity" of recreational land. Prior SNP backcountry management planning appears to have some basis on these assumptions. However, problems with the traditional models have long been identified. A substantial amount of scientific research has found that both assumptions are false due to the complexities of the sociological and ecological relationships involved. For example, numerous surveys of backcountry and wilderness visitors have found that factors such as the location, mode of travel, group size, and behavior of other visitors encountered are more critical to satisfaction than mere numbers of visitors encountered. These factors and others, including vegetation type, season of use, and visitor management policies, are often more influential than visitor numbers in determining the severity of resource impacts. The traditional view of carrying capacity has been too simplistic and has evolved. Complex but fundamental issues need to be considered to resolve disparity in backcountry supply and demand.

The following four points, as described in Wilderness Management (Hendee et al. 1990), address the evolution of the carrying capacity concept:

1. Carrying capacity is a relative term, not an absolute number to be discovered by managers and researchers; its range depends on specific objectives established for an area.

2. Capacity must be established and identified in the field by managerial judgements; no magic yardstick can tell when it will be or when it has been exceeded.

3. Capacity is tied to (a) the qualities of the physical-biological environment, and (b) the qualities of the human experience available in wilderness (ie. SNP backcountry).

4. Development of capacity limits is a necessary part of the planning process for those areas and locations where unacceptable change may occur; to achieve the long term goals of wilderness preservation (ie. SNP backcountry preservation), time and space aspects of

wilderness (ie. SNP backcountry) use must be managed to avoid unnatural changes.

Wilderness Management also describes the following considerations in managing use and impact:

1. Managers need to determine the kinds of impacts that will occur and their possible implications; natural resource, sociological, and managerial factors are to be considered.

2. The inevitability of change is a critical consideration that managers must take into account in prescribing carrying capacities.

3 Determining the amount of change that will be considered acceptable involves a subjective value judgement, but such judgements are derived from the management objectives prescribed for the area (ie. NPS and SNP legislation, administrative policies, management guidelines, and park management objectives).

4. The focus of concern in use and impact management (the impacts of use on resources and other users) is often related to aspects other than the number, or amount, of users.

Limits of Acceptable Change

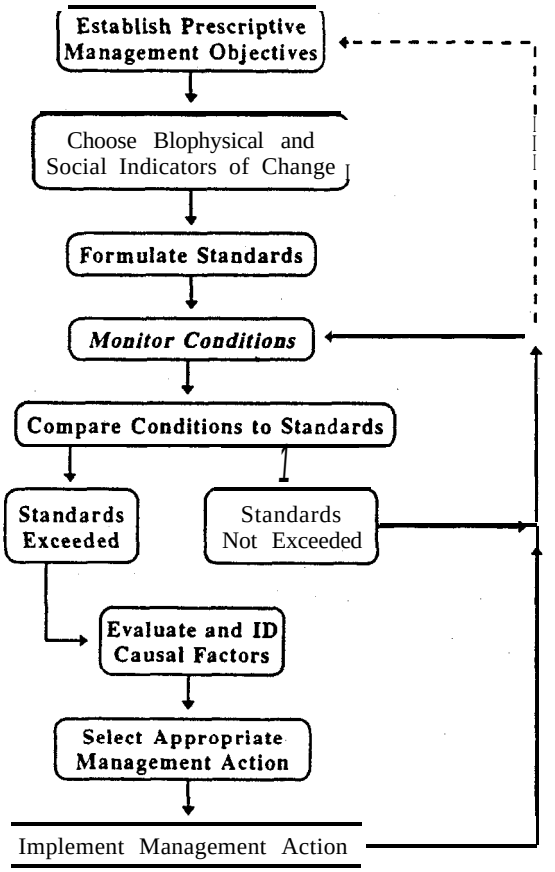
The Limits of Acceptable Change (LAC) process is an evolution or reformulation of the carrying capacity model; it represents a new and alternative approach for resolving the carrying capacity issue (Hendee et al. 1990). LAC focuses on impacts to the conditions of an area that result from use instead of how much use an area will tolerate. It is a planning framework for establishment of limits in the change that may occur within physical-biological and social-psychological parameters of recreational opportunity. Two points are important:

1. For any given use which produces at least some impact, the LAC process requires managers to identify where, and to what extent, certain degrees of change are appropriate and acceptable.

2. Once appropriate and acceptable change has been identified, managers can select from an array of management techniques to ensure that desired conditions are maintained or restored.

SNP has selected a combined LAC and Visitor Impact Management (VIM) (Graefe et al. 1990) model for backcountry management planning as illustrated in Table 4.1 and adapted from Marion et al. (1985). VIM has similarities to LAC and without describing distinctions between the two here, VIM is incorporated into the SNP planning framework.

Table 4.1



The following six steps are used in the application of LAC/VIM to SNP backcountry management planning:

1. Determine prescriptive management objectives:
Specific physical, biological, and social conditions that park management seeks to create, restore, or maintain within areas of the SNP backcountry were described. "Opportunity classes" were defined; collective narrative descriptions of resource, social, and managerial conditions for each opportunity class constitute the management objectives.

Opportunity class designates the availability of a particular quality or kind of experience that is appropriate to the conditions (Hendee et al. 1990). The "Recreational Opportunity Spectrum" (ROS) model, a highly developed recreation classification system, was used to identify opportunity classes and corresponding management objectives (Manning 1986).

2. Describe indicators of change:
Biophysical and social "indicators" of change were identified and described to provide evaluation of the specified management objectives. The ROS model was used as a reference to develop the indicators.

3. Formulate standards:
The indicator "standards" are subjective value judgements by managers (with public input) to specify the "limits of acceptable change," establishing a measurable reference point to which future conditions can be compared. The standards are derived from the management objectives and are quantifiable.

Social and resource inventories are necessary to characterize resource and social conditions. A survey of Shenandoah's backcountry visitors is planned to collect a variety of sociological information. In the interim, backcountry visitor social surveys conducted in the 1970's have been relied upon. Current resource baseline conditions for backcountry campsites were documented in 1992, a trail condition study has also been requested. Standards will need to be revised as these new research surveys are completed and analyzed. Standards will remain flexible so that management "limits of acceptable change" will be realistic. The limits define the boundary between acceptable and unacceptable conditions; standards represent the upper limits which management will permit. However, management will strive 'to keep conditions from deteriorating to this highest acceptable limit. Where possible, it is the intention of SNP to identify the rate of change not to be exceeded in addition to specific standards. In some instances management actions may be taken in backcountry areas as conditions approach, but may not have reached, the established standards. The ROS model was used as a reference in developing the current standards.

4. Monitor conditions:
Standardized monitoring programs are being developed and will be implemented to assess current conditions with respect to each indicator. These programs will include sociological surveys, impacted campsite monitoring, and trail condition monitoring.

5. Compare bio-physical and sociological conditions to standards:
Monitoring data will periodically be compared with standards. Monitoring continues and changes occurring can be evaluated and appropriate preventative management actions will be taken. If the standards are exceeded, more drastic management actions might be necessary. The underlying cause(s) of the problem must be identified and appropriate corrective actions will be selected.

6. Implement management action:
Once actions are selected, they will be implemented. Continued monitoring will be essential to determine the relative effectiveness and success of the implemented actions. An ongoing cycle including steps 4 through 6 will therefore provide the basis for the management of backcountry recreational use in SNP. LAC supports reflection and revision of management objectives (step 1) as conditions warrant.

Recreational Opportunity Spectrum (ROS) Defined

The Limits of Acceptable Change planning framework recognizes that a wide spectrum of recreational opportunities may exist within an area. The LAC/VIMS framework incorporates a recreation classification system called the Recreation Opportunity Spectrum (ROS). ROS is a conceptual model which encourages diversity in outdoor recreational opportunities (USDA Forest Service,' 1980). For a further description of the ROS model and the proposed recreational opportunities for SNP backcountry, see Chapter 4.2, "Management Objectives. "

Part of the theory behind the ROS model is based on human motivations for recreation--why people recreate. From a behavioral science approach, four levels or hierarchies of demand for recreation are described: activities, settings, psychological outcomes, and ultimate benefits. ROS provides a framework for describing recreational settings.

Recreation settings are defined by three broad categories of factors: environmental, social, and managerial. By describing ranges of each of these factors, different types of opportunity classes can be defined. This SNP Backcountry and Wilderness Management Plan includes five different opportunity classes ranging from a Primitive Wilderness Class at the low-use end of the opportunity spectrum to a high-use Threshold Class. A separate opportunity class is identified for the AT and associated structures.

Previously described, SNP's wilderness and backcountry areas are being naturally reclaimed after substantial historical human habitation. There are no large true pristine areas or virgin forests. In much of the backcountry, traces of historical human activity are a reminder to the backcountry user of the culture that existed in the area before the park's creation. The resource descriptions listed under the opportunity classes generally describe SNP's backcountry areas since the park's creation and assist managers to visualize the direction of backcountry and wilderness management at SNP.

SNP is mandated to manage the approximately 80,000 acres of legislatively designated Wilderness areas in the backcountry as described in the Wilderness Act of 1964. However, within these wilderness areas, the recreational opportunities, social conditions for the user, and human impact on the land vary widely. Some areas receive very little use so that the opportunity for solitude is outstanding and human impact is minimal. In other wilderness places, especially trail areas such as the Ridge Trail on Old Rag Mountain, the user may have to actually wait in line to climb rock scrambles. In some trail areas impact on the land has been substantial both in terms of trail and campsite impacts. To a large extent, these use patterns pre-date the area's wilderness designation.

Most of the backcountry is not designated as wilderness. In some of these areas, social and resource conditions meet or exceed those in areas designated as wilderness. Finally, the nationally significant AT is specially legislated as a National Scenic Trail. It is a backcountry trail area with special history, traditions, and values and offers a different social-psychological experience than the backcountry user finds elsewhere in the park.

Factors such as legislative mandates and historic and current use patterns have helped to describe these opportunity classes. Although the LAC process recommends that classification not depend on current use, SNP managers recognize that some areas of the backcountry will continue to receive high levels of use due to factors beyond the control of management efforts. The most noted example is the Old Rag region, which is classified as Threshold in spite of its wilderness designation. Old Rag's popularity as a destination, its ease of access from the park boundary, and the recreation traditions which have been established act against its management within any other opportunity class designation. For the sake of simplicity, wilderness and non-wilderness have been combined in the description of the Semi-primitive Class and Threshold Class. This is not a dilution of the wilderness designation, but acknowledgement that much of the SNP non-wilderness backcountry exhibits characteristics and is managed under the same principles as designated wilderness.

4.2 Management Objectives

Opportunity Classes Defined:

1. **Primitive Wilderness (low use)**

A. Resource Setting

The primitive wilderness setting contains much of the park's designated wilderness areas. The area is characterized by a largely recovered natural environment with lightly maintained or unmaintained trails. Concentration of users is very low, and evidence of other area users is minimal with the exception of existing trails and historical or cultural resources. Ecological and natural processes are not measurably affected by the actions of users. Environmental impacts (human) off trails are minimal and restricted to minor temporary loss of vegetation where camping occurs. These areas typically recover on an annual basis, and impacts are subtle in nature and generally not apparent to most visitors.

B. Social Setting

High to outstanding opportunities for solitude and isolation exist while traveling off trails, and the probability of encounters with other users or management personnel along trails is generally infrequent, particularly with greater distances from Skyline Drive or the boundary. The user has outstanding ~~[illegible]~~ opportunities to travel cross-country utilizing a maximum degree of minimum impact outdoor skills. The environment offers a high

degree, of challenge, self-reliance, and risk. Inter-party contacts will be very few while traveling and low to non-existent at campsites.

C. Managerial Setting

Management strongly emphasizes sustaining and enhancing the natural ecosystem and promoting and perpetuating the wilderness character and values associated with wilderness designation. Backcountry camping permits are required. Necessary rules and regulations will be communicated to visitors outside the area such as at permit-issuing stations or trailheads.

Direct on-site management of visitors is seldom used. Formal and informal user education programs will be initiated to inform users about what to expect and how to use the area for optimum benefits to all. Patrols and monitoring of conditions by appropriate park personnel will be conducted only as necessary to achieve management objectives. Existing trails will be minimally maintained to accommodate light and infrequent travel. New trails will not be constructed. The prevention of resource damage dictates the frequency and specifications of treadwork and drives trail maintenance standards. The objectives for trail maintenance are further described in chapter 8. Signs may be present for resource protection or for trail direction only.

No administrative structures will be provided or permitted. Motorized use within the area is not permitted except under emergency conditions or to meet administrative requirements and then only on a case by case basis.

2. Primitive Non-wilderness (low use)

A. Resource Setting

The Primitive Opportunity Class is characterized by a largely recovered natural environment. User actions minimally affect the ecological and natural processes or the cultural resources. Trails exist but may be minimally maintained. Environmental impacts are low and restricted to minor losses of vegetation where camping occurs and along trails or travel routes. Most impacts, with the exception of trails and historic cultural resources, recover on an annual basis and will be apparent to only a low number of visitors. Primitive areas include much of the non-wilderness areas where use is low.

B. Social Setting

High to outstanding opportunities exist for exploring and experiencing isolation from the sights and sounds of man with the probability of encountering other users being low with greater distances from the Skyline Drive or the boundary. The user has good opportunity for experiencing independence, closeness to nature, tranquility, and self-reliance using minimum impact skills. These opportunities occur in an environment that offers a high

degree of challenge and risk. Inter-party contacts will be low on the trail and rare to non-existent at the campsite with parties camped in isolation.

C. Managerial Setting

Management will emphasize sustaining and enhancing the natural ecosystem and cultural resources. Direct on-site management will involve minimum visitor contact during the normal use season. Backcountry camping permits are required. Necessary rules and regulations will generally be communicated to visitors outside the area through trailhead signs, printed materials, and direct contact with rangers. Formal and informal user education programs will be initiated to inform users about what to expect and how to use the area for optimum benefit to all. Patrols will be conducted by park personnel to monitor conditions and to meet management objectives.

minimum information necessary to protect the resource and to provide direction. New trails will not normally be constructed except to reroute an existing trail or to prevent unacceptable impact from occurring. Trails will be maintained to accommodate light and infrequent travel. The primary objectives of trail maintenance are described in chapter **8.**

Administrative structures will not be allowed. Other structures or facilities such as toilets or hitchracks will not be permitted except in a few rare instances when no other management solution is feasible. Motorized equipment is limited for purposes of trail maintenance by park personnel or other official trail maintenance groups, or for ecological monitoring.

3. Semi-primitive Wilderness and Non-wilderness (moderate use)

A. Resource Setting

The Semi-primitive resource setting is characterized by a mostly recovered natural environment. In a few areas ecological and natural processes are affected by the action of users, but within set standards and limits. Some areas along off-trail travel routes and near human impacted sites may show loss of vegetation or minor erosion. Impacts in some areas often persist from year to year and may be apparent to many visitors. Semi-primitive areas include some of the popular destination-type wilderness and non-wilderness trail areas or areas close to the boundary.

B. Social Setting

Moderate opportunities exist for exploring and experiencing isolation from the sights and sound of man, with a low to moderate probability of encountering other users or park personnel. Encounters with others are likely to increase as the user nears Skyline Drive

or the park boundary. The user has good opportunities for experiencing independence, closeness to nature, tranquility, and self-reliance through the application of minimum impact outdoor skills. These opportunities occur in a natural environment that normally offers a moderate degree of challenge and risk. Contact with other visitors on the trail or while camped may be frequent during peak seasons. Visitors may occasionally encounter park personnel traveling in a motor vehicle along a designated fire road in non-wilderness areas.

C. Managerial Setting

Management will emphasize sustaining and enhancing the natural ecosystem and cultural resources. On-site management will involve routine visitor contact. Backcountry camping permits are required. Necessary rules and regulations will generally be communicated to visitors outside the area, through trail head signs, printed materials, and contacts with rangers. Additionally, contact will be initiated by park personnel during routine patrols. Information concerning protection of site-specific wilderness and backcountry resources will be presented. Formal and informal user education programs will be initiated to inform users about what to expect and how to use the area for optimum benefit to all.

Direct site management may be needed to limit impacts, but only as necessary to meet set standards. Signs will be permitted within the area and will include the minimum number necessary to protect the resource, inform visitors of safety hazards, and for administration. Trails will normally be constructed and maintained to accommodate a moderate level of use for the majority of the use season. The primary objectives of trail maintenance are described in chapter 8.

Administrative structures will be limited to existing cabins or shelters. Other structures such as hitch racks, toilets, pipe springs, and bridges may be allowed but on a limited basis. New structures may be permitted on a case by case basis. Administrative roads may exist as needed in non-wilderness only, but no new ones shall be constructed and maintenance will be limited to clearing the road and limiting erosion. Motorized equipment for purposes of trail maintenance or ranger patrols are limited in non-wilderness areas. Motorized vehicles may be used on administrative roads by authorized persons only. Motorized use within wilderness is not normally permitted except under conditions outlined in chapter 5. No new facilities or structures will be constructed in wilderness.

4. Threshold Wilderness and Non-wilderness (high use)

A. Resource Setting

The Threshold opportunity class is characterized by a predominantly natural and generally recovered environment. Natural conditions in many locations may be substantially affected by the action of users. Environmental impacts may be significant

in areas along major trails and travel routes and near major entry points. Impacts often persist from year to year, and there may be moderate loss of vegetation and soil at some sites. Impacts are readily apparent to most visitors. Threshold areas typically include nature trails and high day-use areas or areas that are close to developed areas or boundary accesses.

B. Social Setting

Opportunities for exploring and experiencing isolation from the sights and sound of man are moderate to low. The probability of encountering or hearing other area users is moderate to high. The user has the opportunity for a high degree of interaction with the natural environment, often with low or moderate challenge and risk. Contacts with other users may be relatively high, both on the trail and at campsites. It may be common during peak use periods for some parties to come within sight or sound of each other while at campsites. Motorized vehicles may be encountered while traveling along an administrative road in non-wilderness areas.

C. Managerial Setting

Management will be oriented to sustaining and restoring the natural ecosystem and cultural resources. On-site management will involve routine visitor contact. Backcountry camping permits are required. Necessary rules and regulations will generally be communicated to visitors outside the area through trail head signing, printed materials, and contacts with rangers. Patrols by park personnel will concentrate on contacting visitors. Information concerning minimum impact, wilderness management, user conflicts, fire prevention, and other pertinent subjects will be presented. Formal and informal education programs will inform users about area conditions and how to use the area to minimize impacts to the resource and to other people.

Direct site management may be used to limit impacts and meet management objectives. Public use restriction and enforcement actions will be initiated when necessary. Signs will be used for resource protection, safety messages, directional purposes, and in non-wilderness areas may be used to present educational information. On nature trails, guide booklets and exhibits may be used. Trails will normally be constructed, maintained, and managed to accommodate seasonally heavy use. The primary objectives of trail maintenance are described in chapter 8. Existing administrative roads will be allowed if needed in non-wilderness areas, but no new roads will be built and maintenance is limited to keeping roads clear and prevention of damage to resources. Administrative structures will be limited to existing cabins or shelters in non-wilderness areas, but no new structures will be built. Other structures such as horse hitching racks, toilets, and bridges may be provided only in exceptional cases. Permitted structures will exist only for resource protection. Motorized equipment may be used by park personnel or other authorized trail maintenance personnel for purposes of maintaining trails in non-wilderness areas or for ecological monitoring. Motorized vehicles may be used on designated administrative roads by authorized persons only in areas not designated as

wilderness. Motorized use within wilderness is not permitted except under emergency conditions or to meet administrative requirements and then only on a case by case basis as described in chapter 5.

5. Appalachian Trail Wilderness and Non-Wilderness (varying levels of use)

A. Resource Setting

The area is characterized as the Appalachian Trail which parallels and frequently crosses Skyline Drive throughout the length of the park. The area adjacent to the trail is largely a recovered natural environment, and the trail itself harmonizes with the natural environment and is well maintained. Concentration of users varies from low to high depending on the season and trail location. Evidence of other AT users is moderate, with the exception of heavy weekend use, and huts and cabins associated with the trail. Environmental impacts off the trail and away from huts may be moderate and may persist from year to year. The opportunity class includes the AT footpath and hut and cabin land assignments (described in the PATC Concessions Permit).

B. Social Setting

Opportunities for exploring and experiencing isolation from the sights and sound of man are low to moderate. The probability of encountering or hearing other area users and vehicles along Skyline Drive is moderate to high. The opportunity for challenge and risk and interaction with the natural environment is low. Much of the time contacts with other users will be relatively high both on the trail and at huts and cabins, however contacts at campsites should be relatively low. It is common for parties to camp together at huts, but parties should be out of sight and sound of each other at campsites along the trail. Motorized vehicles may be seen and heard from the nearby Skyline Drive.

C. Managerial Setting

The existance of the AT as an extended footpath through the park is consistent with park values. The unique natural, cultural, and scenic character of the AT and historic trail construction techniques and tradition of cooperative maintenance are recognized and will be preserved. Park managers have the obligation and responsibility to consult the regional PATC and the national Appalachian Trail Conference (ATC) in accordance with the National Scenic Trail designation in coordination of management actions. Actions will be oriented to sustaining and enhancing the natural ecosystem and cultural resources. Backcountry camping permits are required except at cabins, which require reservations through the PATC. Necessary rules and regulations will generally be communicated to visitors off the trail at entry points or at huts (see chapter 6). Contact will be initiated by park personnel during patrols. Formal and informal education programs will inform users about area conditions and proper use to minimize impacts to the resource and other people.

Direct site management', such as area closures, designated campsites, etc. may be needed to limit impacts. Signs will be permitted along the trail and will include the minimum number necessary to protect the resource and provide safety messages and trail information. The AT will be maintained to a high standard to accommodate a high use level and to maintain the integrity of the special trail designation. The primary objectives of trail maintenance are described in chapter 8. Administrative structures will be limited to existing huts, toilets, and pipe springs and no' new structures will be allowed. The trail crosses administrative roads and the Skyline Drive. Reroutes of the trail wiil be allowed only on a case by case basis, primarily to avoid proximity or crossings of Skyline Drive. Motorized equipment is limited for purposes of trail maintenance by park personnel and the PATC or for ecological monitoring in non-wilderness areas only. Motorized use within wilderness is not permitted except under emergency conditions or to meet administrative requirements and then only on a case by case basis.

Summary of Management Objectives

The following Tables 4.2 and 4.3 describe specific management objectives in the managerial, resource, and social settings for the proposed SNP opportunity classes. Table 4.4 describes social indicators and standards for the opportunity classes. Table 4.5 describes resource indicators and standards for the opportunity classes. Indicators were selected which define specific elements in the SNP backcountry social and resource settings that change in response to human activities. These indicators were selected based on such criteria as reliability, feasibility, expense of measurement, and others (Krumpe and Mergliano, 1987).

Resource standards listed within each opportunity class were determined by the Task Force based on documentation provided by a SNP backcountry campsite inventory conducted in 1992-93 (Marion and Williams, 1993). Campsite "condition class" is defined and described in chapter 9. Social standards are judgements based on the consensus of Task Force member backcountry management experience. These standards will be evaluated and refined upon completion of a SNP backcountry user survey (social inventory).

Indicators can be added or deleted and standards can be revised based on public input, management experience and policies, or 'from monitoring data.

Table 4.2

Summary of Resource and Social Setting Components for Opportunity Classes

COMPONENT	PRIMITIVE WILDERNESS (low use)	PRIMITIVE NON-WILDERNESS (low use)	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS (moderate use)	THRESHOLD WILDERNESS/ NON-WILDERNESS (high use)	APPALACHIAN TRAIL WILDERNESS/ NON-WILDERNESS
Resource Setting: General Description	Regenerated natural environment		Essentially regenerated natural environment	Predominantly regenerated natural environment	
1. Ecological conditions (off trails)	Not measurably affected by the action of users	Minimally affected by the action of users	Moderately affected by the action of users	Many sites substantially affected by action of users (campsites, social trails, viewpoints)	Moderately affected by action of users
2. Prevalence of change due to recreation (off trails)	Minor disturbance to vegetation where camping occurs which usually recovers annually.		Moderate loss of vegetation where camping occurs and along some off-trail travel routes. Impacts in some areas persist annually.	Moderate loss of vegetation and soil on human-impacted sites and off-trail travel routes. Impacts often persist annually.	Moderate loss of vegetation where camping occurs. Impacts may persist annually.
3. Visibility of impacts (off trails)	Not apparent to most visitors	Apparent to a low numbers of visitors	Apparent to a moderate number of visitors	Impacts are readily apparent to most visitors	Apparent to a moderate number of visitors
Social Setting: General Description	High to outstanding opportunities for isolation and solitude		Moderate opportunities for isolation and solitude	Low to moderate opportunities for isolation and solitude.	
1. General level of encounters	Low to infrequent		Moderate	Moderate to high. Groups are common.	Frequent to Very Frequent
2. Degree of challenge and risk	High		Moderate to Low	Low to moderate	Low
3. Interparty contacts while traveling	Few		Moderately frequent	Numerous. May have to stop to let others pass.	Few to numerous.
4. Interparty contacts at campsite	Low to non-existent		Moderately frequent	Common	Common at facilities

ıble 4.3

Summary of Managerial Setting Components for Opportunity Classes

COMPONENT	PRIMITIVE WILDERNESS (low use)	PRIMITIVE NON-WILDERNESS (low use)	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS (moderate use)	THRESHOLD WILDERNESS/ NON-WILDERNESS (high use)	APPALACHIAN TRAIL WILDERNESS/ NON-WILDERNESS
Managerial Setting: General Description	Strongly emphasize sustaining and enhancing natural ecosystem with no development	Strongly emphasize sustaining and enhancing natural ecosystem	Emphasize sustaining and enhancing the natural ecosystem with limited development		
1. Contact with park staff	Infrequent	Minimum	Routine		
2. Rules and regulations	Will be communicated to visitors primarily outside of the backcountry at trailheads and ranger stations		When necessary, on-site enforcement and communications of rules and regulations will be conducted through regularly scheduled patrols		Primarily communicated at contact stations and huts
3. Formal and informal user education programs	Will be initiated to inform users about minimum impact use and what to expect for optimum benefit for all.				
4. Direct site management	Very limited--i.e plant large rocks to close site if impact exceeds standards	Very limited	Limited actions only as necessary to meet standards or objectives	Designated sites, closures, site hardening etc. as necessary to meet standards or objectives.	Maintain huts; otherwise limited actions to meet objectives or standards
5. Backcountry camping permits required	Required in all opportunity classes				
6. Level of trail maintenance	Managed to accommodate light use. Unmaintained trails may exist. No new trail construction.	Managed to accommodate light use. Unmaintained trails may exist. Limited construction of new trails.	Managed to accommodate moderate use and prevent resource damage	Managed to accommodate heavy use.	Maintained to high standards to accommodate heavy use.
7. Type of trail use	Foot/X-country ski. Horses on designated trails only.				Foot/X-Country Ski
8. Presence of administrative structures (cabins, huts, towers)	No non-historic structures allowed.		No new structures to be built.		Huts exist every 10-15 miles with several cabins and maintenance huts in non-wilderness. No new structures to be built.

COMPONENT	PRIMITIVE WILDERNESS (low use)	PRIMITIVE NON-WILDERNESS (low use)	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS (moderate use)	THRESHOLD WILDERNESS/ NON-WILDERNESS (high use)	APPALACHIAX TRAIL WILDERNESS/ NON-WILDERNESS
9. Presence of other structures (toilets, hit&racks, bridges,etc.)	Provide at the absolute minimum; in wilderness, permitted only as minimum requirement to meet purposes of wilderness (use Decision Tree)		A few permitted for resource protection or visitor safety only; in wilderness, permitted only as minimum requirement to meet purposes of wilderness (use Decision 'Tree).		
10. Presence of signs (*use backcountry sign guidelines)	Minimal signage: Resource protection, directional, and trailhead signs	Resource Protection, direction& trailhead, safety signs		Resource Protection, directional, trailhead, safety and interpretive signs	Resource Protection, directional, trailhead. and safety signs
11. Motorized vehicles and equipmeut	None allowed, except as permitted as minimum requirement to meet purposes of wilderness (use Decision Tree)	None allowed, except for motorized equipment use for trail maintenance and resource monitoring activities	Vehicles allowed on existing administrative roads for authorized use only; no roads exist in wilderness. Motorized equipment use permitted for administrative purposes in non-wilderness; motorized/mechanical uses not permitted in wilderness except as minimum requirement to meet purposes of wilderness (use Decision Tree).		
12. Administrative roads	None allowed		Only necessary and existing administrative roads in non-wilderness areas. No new roads to be constructed. No roads are permitted in wilderness.		None allowed except where trail crosses existing road.
13. Commercial Enterprises	None, except as permitted as minimum requirement to meet purposes of wilderness by Incidental Business Permit (IBP) or Concessions Agreement (use Decision Tree).	Permitted backcountry dependent activities by IBP or Concessions Agreement only	Permitted backcountry dependent activities by IBP or Concessions Agreement (use Decision Tree).		
line corridors	None allowed	As exists	As exists in non-wilderness only. None permitted in wilderness.		As exists in non-wilderness. None permitted in wilderness.

able 4.4

Standards for Resource Indicators for each Opportunity Class

INDICATORS	PRIMITIVE WILDERNESS	PRIMITIVE NON-WILDERNESS	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS	THRESHOLD WILDERNESS/ NON-WILDERNESS	APPALACHIAN TRAIL WILDERNESS/ NON-WILDERNESS
1. Number of informal trails to campsite.	No more than two.		No more than three.	No more than four.	No more than two
2. Total campsite size (square feet).	No greater than 200 square feet.		No greater than 800 square feet.	No greater than 1000 square feet.	No greater than 800 square feet.
3. Area of vegetation loss within campsite (square feet).	No greater than 25 square feet.		No greater than 225 square feet.	No greater than 600 square feet.	No greater than 225 square feet.
4. Area of soil exposure within campsite (square feet).	No soil exposure.		No greater than 120 square feet.	No greater than 400 square feet.	No greater than 120 square feet.
5. Number of campsites exceeding a particular condition class rating per 640 acres.	No sites within condition class 3 or above.		No sites within condition class 5. No more than two sites in class 4. No more than three sites in class 3.	No sites within condition class 5. No more than three sites in class 4. No more than five sites in class 3.	No sites within condition class 5. No more than two sites in class 4. No more than three sites in class 3.
6. Number of campsites per 640 acres.	More technical information is needed to develop practical and measurable indicators and standards for campsite densities and trail conditions.				
7. Trail Conditions.					

Table 4.5

Standards for Social Indicators for each Opportunity Class

INDICATORS	PRIMITIVE WILDERNESS	PRIMITIVE NON-WILDERNESS	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS	THRESHOLD WILDERNESS/ NON-WILDERNESS	APPALACHIAN TRAIL WILDERNESS/ NON-WILDERNESS
1. Amount of litter.	No amount of trash is acceptable and therefore a standard cannot be set.				
2. Noise	See narrative below.				
3. Number of trail encounters with other parties per day.	0 to 3 parties		0 to 12 parties	Any number of parties may be encountered	
4. Number of other parties camped within sight & continuous sound.	0 parties		0 to 2 parties	0 to 4 parties	0 parties except at huts; hut capacity should not be exceeded

The results of a backcountry visitor study (1997-1998) will be used to help address the social indicator, "noise." Standards of acceptable noise in the backcountry may be related to the number and distribution of campsites, the number of encounters with other groups at campsites, and aircraft overflight disturbances. The aircraft overflight issue has been surveyed in 1992 and survey results will be evaluated for possible application to a backcountry noise standard.

Future Action

A. Establish or refine resource and social indicators and standards.

B. Determine initial management actions to be taken to meet the standards established for opportunity classes.

4.3 Mapping of Opportunity Class "Zones"

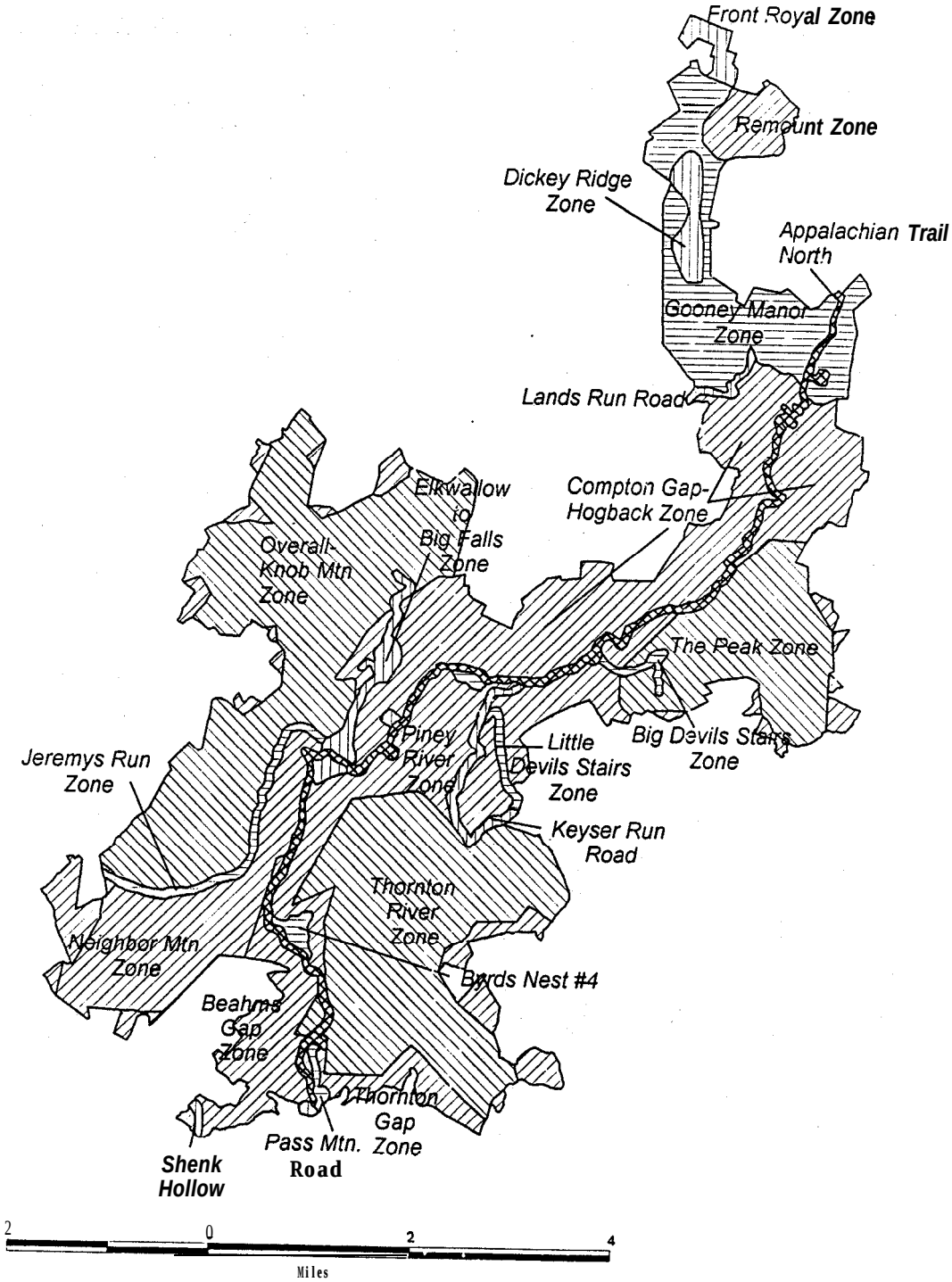
The opportunity classes as described in the management objectives have been mapped by the park's Geographic Information System (GIS) (see figures 4.6, 4.7, and 4.8, attached). Opportunity class mapping was performed by district backcountry field rangers familiar with general visitor use patterns and resource protection needs in the backcountry. The physical boundaries of the opportunity classes are generally not well-defined, but can be in the future if the need arises.

Future Action

A. Review, revise opportunity class maps to improve consistency in perceived "levels of use" between the districts.

Figure 4.6

Shenandoah National Park
North District
Recreational Opportunity Classes



Recreational Opportunity Class

- Appalachian Trail Wilderness and Non-wilderness
- Primitive Non-wilderness
- Ptimilive Wilderness
- Semi-primitive Wilderness and Non-wiiderness
- Threshold Wilderness and Non-wilderness

Figure 4.7

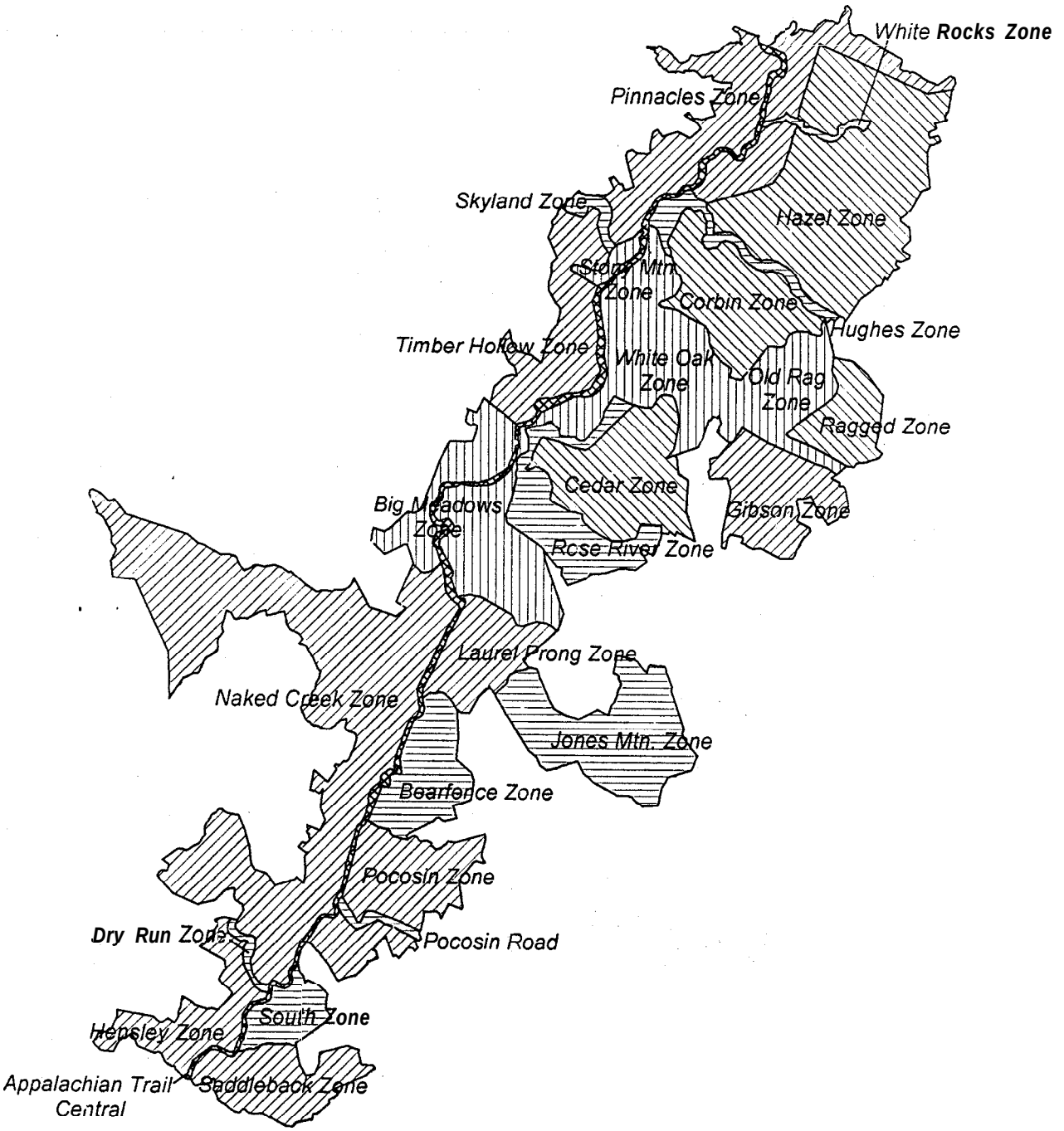
Shenandoah National Park
South District
Recreational Opportunity Classes

Recreational Opportunity **Class**

- *Appalachian Trail Wilderness and Non-wilderness*
- *Primitive Non-wilderness*
- *Primitive Wilderness*
- *Semi-primitive Wilderness and Non-wilderness*
- *Threshold Wilderness* **and** *Non-wilderness*

Figure 4.8

Shenandoah National Park
Central District
Recreational Opportunity Classes



Recreational Opportunity Class

- Appalachian Trail Wilderness and Non-wilderness
- Primitive Non-wilderness
- Primitive Wilderness
- Semi-primitive Wilderness and Non-wilderness
- Threshold Wilderness and Non-wilderness

CHAPTER 5
WILDERNESS MANAGEMENT POLICY

5.1 Wilderness Concept and Principles

Brief descriptions of the Wilderness Act of 1964 and authorization of eastern wilderness areas in 1975 are found at chapter 1.6. A detailed historical and philosophical perspective of SNP wilderness designation is found in a collection of materials compiled by former Superintendent Robert R. Jacobsen in an October 1983 memorandum entitled "Wilderness Management Plan."

National Wilderness Concept and Administration

Public perceptions of wilderness vary widely; some urbanites with little experience in the natural environment might perceive wilderness as any undeveloped wildland. Some people perceive wilderness as a place unmodified by human development not unlike the North American continent prior to European settlement. The concept of "wilderness" has deep, worldwide historical roots. People from different cultures may have widely different perceptions of wilderness. Wilderness was long debated by the U.S. Congress during development of the 1964 Wilderness Act and wilderness quality and value continues to be examined and debated.

The rationale and philosophy of the wilderness concept have been eloquently described in the written works and actions of Aldo Leopold, John Muir, Arthur Carhart, Bob Marshall, David Thoreau, among many others. More recent writers such as Roderick Nash and Michael Frome have further examined the modern concept of wilderness. The actions and determination of scientists, government employees and citizens with strong wilderness stewardship principles, including Howard Zahniser, Benton Makaye, William Whorf, Tom Kovalicky, and Paul Weingart, just to name a few, have advanced the protection and preservation of wilderness. An entire textbook dedicated. to management of the wilderness resource, Wilderness Management, has been published. Many publications reporting a wide range of wilderness research are readily available. Organizations such as the Wilderness Society, Wilderness Watch, and the International Wilderness Leadership Foundation are dedicated to the understanding and preservation of wilderness. A number of other national organizations, such as the George Wright Society, Sierra Club, Audubon Society, and the National Wildlife Federation also dedicate much of their energy to preservation of wilderness quality. Organizations including the National Outdoor Leadership School (NOLS) and Outward Bound conduct wilderness-based experiential programs for the public while also teaching wilderness conservation skills and ethics. Many wilderness recreationists are familiar with the NOLS national education program called Leave No Trace whose mission is to educate wildland user groups, federal agencies and the public about minimum-impact recreation.

The National Wilderness Preservation System (NWPS) is administered by four of the federal land management agencies: the USDA Forest Service, USDI Bureau of Land Management, Fish and Wildlife Service, and National Park Service. The Arthur Carhart National Wilderness Training Center is managed cooperatively by these agencies and is dedicated to achieving excellence in wilderness field management. The Aldo Leopold Wilderness Research Institute was formally established in 1993 to bring focus to ecological and human dimensions research

relevant to understanding and managing wilderness resources. This institute is located on the campus of the University of Montana in Missoula. Wilderness-based education is available at a number of universities. A comprehensive wilderness education correspondence course is available through the University of Montana.

SNP Wilderness Designation

Protecting and preserving wilderness quality is a difficult challenge, particularly at SNP because of its popularity and proximity to major population centers. Wilderness is the least modified, or "primeval 'l extreme on the spectrum of land uses. Wilderness is sensitive to a wide variety of human impacts, including impacts from adjacent non-wilderness lands in highly developed and conflicting land uses. SNP is in a unique position of providing eastern wilderness land which is largely protected by adjacent NPS non-wilderness land use. Except for those wilderness areas in close proximity to non-conforming uses on privately-owned lands on park boundary, wilderness area is bounded and protected by park backcountry in similar use.

Within 30 years of Park establishment, by the 1960's the SNP forests had returned to a primarily forested condition after having been extensively logged, burned, farmed, grazed, mined, and inhabited and built upon by several generations of people. Superintendent Taylor Hoskins and later on Superintendent Robert Jacobsen recognized that the forests had "recycled" from prior human use and could be considered to possess those qualities described in the Wilderness Act and, upon its creation, the "Eastern Wilderness Act."

Upon Jacobsen's arrival at the Park in 1972, he "found Congress in the initial stages of a 5-year long debate on how much of the Park should be officially designated as a portion of the Wilderness Preservation System." Also, "Backcountry use was exploding in 1972.. . Shenandoah was trying, like many other park and forest areas, to accomodate this use in the classical manner-- by concentrating overnight use and hardening the impacted sites. But the system wasn't working.. . Overnight solitude was rare and hard to find, sanitation problems were developing, and on busy weekends the designated campsites took on the appearance of county fairgrounds. " A campsite "dispersal" system was pioneered and, together with backcountry regulations designed to prohibit or restrict a few traditional and destructive backcountry practices, a system of keeping impacts to "acceptable levels" proved to be suited for later wilderness designation, As wilderness designation was debated hotly locally and in Congress, Jacobsen strained for guidance in addressing such concerns as "how, for example, could a wilderness manager assure the retention of "primeval character and influence" in "mini-wilderness" areas.. . " and, "How could a wilderness manager provide a place for "physical and mental challenge" in small wilderness areas that are within sight and sound and smell of major highways, private lands, and residential and industrial development; and how could a wilderness manager provide opportunities for "solitude" and "inspiration" where high levels of day use are already firmly established without imposing very costly and highly unpopular systems for rationing use?"

Jacobsen struggled with the concept of high volumes of visitor use occurring in some proposed SNP wilderness. He noted a "major conceptual breakthrough" in 1976 when the Department

of the Interior officially notified the Senate Subcommittee on Parks and Recreation that it was planning to recognize three types of wilderness. One of the three types was described as, "Still other areas of wilderness have a number of constructed trails and are within a short distance of access roads. These areas typically appeal to novices or families with young children and are used primarily for a few hours to a day or two. This type of wilderness receives moderate to frequent use, requires the highest degree of management and maintenance of the three, and could be referred to as zone I." According to Jacobsen, "An earlier memorandum had already noted that all of the proposed wilderness in Shenandoah would be of the last type" (zone I). Jacobsen further stated that he was comfortable with the idea that "... heavy use could continue to occur along established trail corridors within the park's designated wilderness areas so long as overnight use could be sufficiently well-dispersed to keep its social and resource impacts within acceptable limits." While the three levels of wilderness proposed by the Department apparantly did not materialize as policy, the legislative history and management direction of SNP wilderness was initially established in this concept.

According to a 1975 Department memo, as the SNP wilderness Congressional hearings continued through 1975 significant public concern was expressed "that wilderness designation of the White Oak Creek and Old Rag Mountain areas in Shenandoah National Park would be detrimental due to the possible restriction which would be placed on the number of visitors permitted in these areas under wilderness management practices. Further, allegations are made that we would not be able to provide and maintain foot and horse trails commensurate with the public's desire to use these areas." The House of Representatives voted in favor of designating wilderness, and resulted from the Senate's action of attaching its version of this proposal to an omnibus measure for the designation of wilderness in several other NPS areas. Senator Harry Byrd of Virginia assured that the proposal included non-wilderness corridors in the Old Rag, White Oak Canyon and Rose River areas of Madison County. A l-acre non-wilderness area was established around the Corbin Cabin (Central District) due to its use as a rental cabin by the PATC; the cabin was determined to "provide visitor conveniences which exceed those suitable in wilderness" and constituted a "commercial enterprise which is prohibited by section 4(c) of the Wilderness Act."

Congress designated approximately 79,019 acres of "Shenandoah Wilderness" in October, 1976, in three areas and eleven separate parcels. Jacobsen states, "We recognized, through its relatively small size, its already established levels and patterns of visitor use, and the presence of immediately adjacent non-conforming land use activities, that our wilderness area was not of the highest order-- and immediately adopted a "non-degradation" policy. .." and, while our wilderness is not supreme, we will not allow its primeval character, and its opportunities for solitude, inspiration, and physical and mental challenges to decline. Furthermore, we will strive, and might be able, to improve its overall quality." For the next year and a half the wilderness designation was implemented according to a schedule which included such activities as shelter removal, establishment of bear-proof concrete trail signposts at trail junctions, removal of all other signs, removal of man-made water developments, closure and rehabilitation of "fire" roads and permanent blockage of closed roads. Additional removals and administrative transference of special access permits to other roads enabled the Park to designate an additional 560 acres of potential wilderness as wilderness through publication of a Federal Register notice

in September, 1978, for a total wilderness acreage of 79,579.

Presently, general guidance for management of SNP wilderness can be further provided by Wilderness Management which states: "Wilderness management is essentially the management of human uses and influences to preserve naturalness and solitude. It includes everything done to administer services; the formulation of goals and objectives, and all policies, standards, and field actions to achieve them." Also, "Wilderness management should not mold nature to suit people. Rather it should manage use and influences so as not to alter natural processes. Wilderness managers should do only what is necessary to meet wilderness objectives and use only the minimum tools, regulation, and enforcement required to achieve those objectives.", SNP wilderness management and stewardship intends to follow this philosophy. However, SNP wilderness managers must grapple with the great popularity of some of its wilderness destination sites and easy access to wilderness provided by the Skyline Drive, numerous boundary access points, and hundreds of miles of trails.

SNP wilderness conditions as those described in the "zone I" concept are inherent in SNP wilderness designation. The BWMP strives to describe specific management objectives for SNP backcountry and designated wilderness by identifying standards (Jacobsen's "acceptable limits") and managing limits of acceptable change to resources and the visitor experience. As SNP wilderness management philosophy evolves to a more "pure" or biocentric interpretation of the Wilderness Act, SNP wilderness managers must address rationing of visitor recreation use (particularly day use) and substantial changes to visitor services (ie. quality of emergency operations) and facilities (ie. trail conditions and standards). However, a strictly anthropocentric viewpoint would focus on human conveniences in the wilderness environment, perhaps leading to the loss of a most essential wilderness quality, naturalness. Details of management may vary among wildernesses, and Wilderness Management, in noting the range for debate on biocentric versus anthropocentric emphasis in wilderness management, provides a statement by the late Senator Frank Church (floor manager of the Wilderness Act when it passed the Senate and former chairman of the Interior Subcommittee on Public Lands):

> ". . . if purity is to be an issue in the management of wilderness, let it focus on preserving the natural integrity of the wilderness environment - and not needless restriction of facilities necessary to protect the area while providing for human use and enjoyment."

Wilderness Management continues that "Our hope is that the philosophy that ultimately prevails will emphasize the natural integrity of wilderness ecosystems, with common-sense applications that respond to the needs of individual areas."

SNP wilderness management philosophy tends to the "pure ", or biocentric interpretation of the Wilderness Act. At SNP, we will strive to maintain --or where necessary create-- the quality of the wilderness experience described in the Wilderness Act, and minimize degradation of resources. High use may need to be restricted in order to meet these objectives, in addition to methods discussed elsewhere in this plan for dispersing use and limiting impacts. While common sense must be used, NPS managers have a legal obligation to keep these values foremost in our management of wilderness.

General guidance for wilderness management is provided within the Wilderness Act itself and more specific direction is included in NPS Management Policies (Chapter 6). SNP wilderness management objectives and descriptions of opportunity classes (management zones) are provided in chapter 4 of the BWMP.

SNP Wilderness Management Accountability

While all SNP employees, volunteers, researchers, and others interacting with the wilderness resource have Wilderness stewardship responsibility, wilderness management accountability at SNP is clearly defined in the park's management organization. The Superintendent is ultimately responsible for the park's wilderness program. The Division Chief for Natural and Cultural Resources directs the park's Branch Chief for Backcountry, Wilderness, and Trails Resources, who serves as the parkwide Backcountry and Wilderness Manager. The Backcountry and Wilderness Manager assures that this BWMP is adhered to and periodically updated and refined. This position coordinates the "minimum requirement" policy using the tools as described in chapter 5.2.

5.2 "Minimum Requirement"

Section 4 of the Wilderness Act says:

> Except as specifically provided for in this Act, and subject to existing private rights, there'shall be no commercial enterprise and **no** permanent road within any wilderness areas designated by this Act and, **except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act** (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area. (bold supplied)

NPS Management Policies, Wilderness Preservation and Management, provides direction for management techniques in NPS wilderness:

> In protecting wilderness character and resources and in managing wilderness use in accordance with the Wilderness Act, the National Park Service will adhere closely to the "minimum (requirement)" concept. Superintendents, in accordance with the wilderness management plan, will select the minimum tool or the administrative practice necessary to successfully and safely accomplish the management objective with the least adverse impact on wilderness character and resources. All decisions pertaining to administrative practices and use of equipment in wilderness will be based on this concept, Potential disruption of wilderness character and resources and applicable safety concerns will be considered before, and given significantly more weight than, economic efficiency. If some compromise of wilderness resources or character is unavoidable, only those actions that have localized, short-term adverse impacts will be acceptable.

Furthermore,

> Administrative use of motorized equipment or mechanical transport . . . will be authorized in accordance with the park's wilderness management plan only (1) if determined by the superintendent to be the minimum required action needed by management to achieve the purposes of the area, or (2) in emergency situations involving human health or safety or the protection of wilderness values. Such management activities will be conducted in accordance with all applicable regulations, policies, and guidelines and, where practicable, will be scheduled to avoid creating adverse resource impacts or conflicts with visitor use. (Chapter 6:4)

NPS Director's Order #41 (draft, 1998) explains that "minimum requirement" is the documented process used to determine if uses and activities otherwise prohibited by the Wilderness Act can be allowed and, if they are allowed, the most appropriate methods to complete those actions within wilderness. In order to allow a prohibited activity, the activity must be necessary to manage the area as wilderness.

The minimum requirementprocess applies to ALL administrative actions, programs, and activities within wilderness. This BWMP provides a **SNP Wilderness "Minimum Requirement" Decision Tree** (Appendices, chapter 16.7) which provides systematic guidance for wilderness management decision making in considering minimum requirement alternatives. If a "project" which will affect wilderness is being considered, the Decision Tree is also used in conjunction with the SNP Project Clearance Form (PCF), an internal park planning process used to review and document projects for environmental and cultural compliance.

5.3 Recreational Use

The Wilderness Act provides for the enjoyment of wilderness by people. The act states: "It is ... the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness." Wilderness managers are legally mandated to produce the important benefits which wilderness provides to people. Wilderness recreation management, including management of associated facilities, should conform to SNP wilderness philosophy, as described above in chapter 5.1 and as stated in management objectives in chapter 4.

Day hiking and overnight camping are wilderness-dependent recreational activities which encompass nearly all visitor use within SNP wilderness. Rock climbing occurs at some of the more accessible cliff sites. Recreation using mechanized equipment, such as bicycles and mountain bikes, and use of aircraft such as hang gliders are prohibited in wilderness. Use of motorized vehicles and equipment is prohibited. Pack animals are permitted and, as elsewhere in the backcountry, are restricted to those trails which are blazed with yellow paint.

Trails

Typically, visitors use trails to access and travel through wilderness areas. As stated by former NPS Director Gary Everhardt at Congressional hearings in 197.5,

> Trail management is critical to providing for use that does not diminish the wilderness resource through which the trails pass. Trail location, maintenance, and use are all vital elements. An essential aspect of wilderness management is flexibility to change use patterns as necessary to protect resources and to achieve other management objectives. This may include closing some trails and constructing new ones at new locations within wilderness.

Although specific standards for trail conditions and management techniques may differ slightly between opportunity classes, wilderness trails are generally maintained so that hikers or riders may pass in single file. Wilderness trails and boundaries are not signed or marked as such (this may change in the future; see chapter 6.8, Future Actions). Trees are marked with blue, yellow, or white blazes in the trail corridor to identify the trail type to the user and to a much lesser purpose to guide the novice wilderness user. Blazing is maintained on wilderness trails in accordance with the management expectation that a wide range of user experience and skills are prevalent on even the "remote" wilderness trails. While some trail "hardening" (improvements such as rock steps, erosion control devices using natural materials, etc.) may be desirable and perhaps necessary to mitigate resource damage and other problems caused by heavy visitor use, paving of trails is not permitted. Management Policies states that although the development of facilities to serve users will generally be avoided, campsites may be designated when essential for resource protection or enhancement of opportunities for solitude; restrictions on these facilities in wilderness are also described.

Further description of management objectives for wilderness recreation is found in chapter 4, general recreation activity information is provided in chapters 2 and 7, and trail maintenance standards and techniques are described in chapter 8.

5.4 Research, Monitoring, and Resource Management

NPS Management Policies, Wilderness Preservation and Management, provides direction for research and monitoring activities in SNP wilderness:

> In every park containing wilderness, the conditions and long-term trends of wilderness resources will be monitored to identify needs for, and results of, management actions... [E]very wilderness monitoring program will not only assess physical and biological resources, but also identify what impacts people have on resources and values and what impacts they have on other people using the wilderness. These monitoring programs will also be designed to identify whether or not wilderness resources are being impacted by human activities outside the wilderness, and if so, to determine the nature, magnitudes, and probable sources of those impacts...

The statutory purposes of wilderness include scientific and educational use, and the National Park Service will fully support the value of wilderness areas as natural outdoor laboratories. A research project may be conducted in wilderness if it rneets all of the following requirements:

The research activities are otherwise allowable under federal laws and regulations.

There is no alternative to conducting the research in a wilderness area.

The project will not adversely affect physical or biological resources, ecosystem processes, or aesthetic values over an area or duration greater than necessary to meet research objectives.

The project will not interfere with recreational, scenic, or conservation purposes of the wilderness over a broad area or long duration.

Hydrologic, hydrometeorologic, seismographic, and other research and monitoring devices may be installed and operated in wilderness only upon a finding that (1) the desired information is essential and cannot be obtained from a location outside of

accomplish the objective safely and successfully. Devices located in wilderness will be removed when determined to be no longer essential.

The long term protection of an area requires a level of understanding which sometime requires on-site investigations. The scientific understanding of a wilderness area is a value of the wilderness and aids in its preservation. It is imperative, however, that the benefits of what may be learned outweigh any negative impacts on other wilderness values.

SNP has made a major commitment to natural resources inventory and monitoring (see chapter 10.3). Research and monitoring activities will be encouraged in wilderness areas in the park, *provided they meet the guidance from NPS Management Policies above.* Methods which minimize the impact of research and monitoring on wilderness values will be used where available. When possible. non-mechanized means and non-destructive sampling procedures shall be used to gather needed research and monitoring information. If mechanized means (e.g. backpack electrofishing devices to monitor fish communities in wilderness streams) or destructive sampling procedures are the only practical means of acquiring needed information in wilderness, they shall be reviewed and documented using the parkwide clearance process.

Research and monitoring activities proposed in wilderness areas by non-park investigators shall be reviewed according to the park's research guidelines, which address proposal formats, peer review/quality assurance, collections, permits, and reporting. Wilderness values are specifically addressed in the review criteria, consistent with this chapter. Projects, if meeting permit criteria, will be submitted on parkwide clearance forms.

All research and monitoring activities in wilderness will be documented in the park's Resource

Management Plan and (when appropriate) Investigator's Annual Report. Long-term records will be maintained by the staff of the park's Division of Natural and Cultural Resources.

Natural Resource Management

Natural resource management activities in SNP wilderness, other than research and monitoring described in the previous section, shall be limited to restoration of ecological integrity and mitigation of existing or potential resource degradation caused by human activity. As the need for these actions will frequently be identified as a result of the research and monitoring activities, the same criteria, restrictions, and documentation guidelines shall apply.

Cultural Resource Management

Historic structures, cultural landscapes, objects, and other cultural resources exist in wilderness areas within SNP. Cultural resources within designated wilderness areas will be protected in accordance with Federal law. Wilderness designation, in and of itself, shall not affect the NPS' cultural resource management responsibilities.

Cultural resource management actions, however, shall not adversely affect the overall wilderness character of the area. Cultural resources in wilderness will be inventoried, monitored, and evaluated. Scientific inquiry and use will be evaluated and permitted according to the same criteria (*vis* a *vis* wilderness) as for natural resources. Cultural resource investigation will be evaluated by policies established in NPS-28 (Cultural Resource Management Guidelines) or in accordance with the Archeological Resources Protection Act (ARPA). While this does not mean that all cultural resources will be preserved, significant cultural resources may be protected from human-caused or natural deterioration. Stabilization, archeological investigation, and similar survey and/or protection activities may be approved on a case-by-case basis by the superintendent and appropriately documented in the park RMP and other long-term records. As with natural resources, methods that temporarily infringe on the wilderness character of an area, resulting in unavoidable, localized, short-term impacts, may be approved only if alternate methods are not available.

5.5 Emergency/Fire Operations

Emergency Operations

According to NPS Management Policies, "The saving of human life will take precedence over all other management actions." In regard to wilderness, emergency operations may require some reliance on motorized equipment as the minimum requirement for search and rescue purposes. Historically, SNP has not opened roads into wilderness to facilitate a rescue by motorized vehicle; this is a difficult ethical issue, but the proximity of SNP wilderness to roads at park boundary and the Skyline Drive seem to provide the accessibility which has made evacuation of patients by Stokes litter to be most effective. Chainsaw equipment might be used to quickly clear an existing but sparsely maintained wilderness trail to facilitate an evacuation. Again citing Management Policies, "... park visitors assume a certain degree of risk and responsibility for their own safety when visiting areas that are managed and maintained as natural, cultural, or recreational environments." While this degree of risk and responsibility by the park visitor has

not been specifically determined, the visitor should assume the highest degree of risk and responsibility in the Park's wilderness areas which are managed primarily for the preservation of natural conditions. The SNP Emergency Operations Plan provides some information on these issues.

Wildland Fire Operations

The SNP Wildland Fire Management Plan (FMP) does not specifically address fire management in Park wilderness area. Fire suppression strategies and tactics are described in the FMP for the Natural Zone, of which the Wilderness Subzone is a component. The FMP and NPS-18, Wildland Fire Management, do describe minimum impact suppression tactical (MIST) guidelines and fire site rehabilitation and restoration techniques which are generally compatible with wilderness management objectives.

Management ignited prescribed fire is a natural resource rnanagement activity which can be used to restore the ecological integrity of SNP wilderness areas. Human activity including the immediate suppression of all wildland fire has resulted in accumulations of fuels in some wilderness areas. A management objective of the FMP is: "To perpetuate natural resources and processes, as naturally influenced by fire within the Park." The FMP states: "A program that allows suppression actions to be taken in an otherwise natural fire unit may be augmented by a program of management ignited prescribed fire, in order to reduce fuel accumulations and duplicate natural processes. The program allows management ignited prescribed fire to achieve resource management objectives." The FMP provides a description of projects, strategies, and guidelines for SNP management ignited prescribed fire.

Future Actions

A. Assure that future revision of the SNP Wildland Fire Management Plan addresses preservation of wilderness resources and that all fire operations in wilderness will be managed in keeping with the application of the "minimum requirement" concept.

CHAPTER 6
FACILITIES

6.1 Shelters

In the early 1970's, there were 21 trailside shelters in Shenandoah National Park. Seventeen had been constructed in the 1930's and those which remain are historic. During the 1960's four additional shelters, the "Byrds Nests" donated by the late Senator Harry F. Byrd, were added. These shelters were available for overnight use by any and all hikers on a first-come-first-served basis. Due to overuse of the shelter areas, in 1974 all shelters were closed to overnight use except for emergency situations. In 1979 and 1980 several of the shelters were converted into the present day Appalachian Trail "huts" for use by long distance hikers (see chapter 6.3) and some were removed.

Currently, there are five three-sided "shelters" in the Park with four in the Central District and one in the North District. These include the Old Rag Shelter and the four "Byrd's Nests" shelters. These shelters are available for day use and emergency shelter only and are not available for overnight camping. Fires are only allowed in the fireplaces provided. Not all of the shelters have fireplaces.

Shelter	District	Location	Fireplace
Old Rag	Central	Saddle Trail	yes
Byrds Nest 1	Central	Saddle Trail	yes
Byrds Nest 2	Central	Hawksbill	no
Byrds Nest 3	Central	Meadow Spring	yes
Byrds Nest 4	North	Neighbor Mtn.	no

The shelters are allowed in the Semi-Primitive Non-wilderness and Threshold (Non-wilderness) opportunity classes only. No new shelters will be built, and the existing shelters will be minimally maintained.

Future Actions

A. Evaluate the need for continued maintenance of the administrative roads leading to shelters. Maintain abandoned roads as trails (assure rehab/erosion control of closed or abandoned roads).

0. Evaluate removal of existing toilets, fireplaces, and protected water supplies at shelters. Schedule and perform removal of facilities as deemed appropriate.

6.2 PATC Cabins

The PATC, authorized by a Concessions Permit, maintains and operates six rental cabins in various backcountry locations. The cabins may be reserved by PATC members and non-members through the PATC headquarters. A small land parcel around each facility is assigned to PATC for use and maintenance. Sanitary facilities, consisting of a single pit privy, are

provided and maintained by the PATC at each cabin.

Cabins are located in the Semi-primitive, Threshold, and Appalachian Trail opportunity classes only. Existing cabins include Range View in the North District, Corbin, Rock Spring, Jones Mountain, and Pocosin in the Central District, and Doyles River in the South District. ~~Only Corbin Cabin in the Central District is found within a designated wilderness area~~. Ail of the PATC cabins are believed to be eligible for the National Register of Historic Places. No new cabins will be constructed in the Park.

The use of cabin facilities does not require a backcountry camping permit. Cabin users are required to properly store all food supplies either by keeping food inside the cabin or by abiding with backcountry food storage regulations and hanging it out of reach of wildlife outside. No poisons, fungicides, or insecticides may be used for pest control without prior written approval from the park IPM coordinator. Standing trees, whether dead or alive, may not be cut except upon administrative requirement (ie. hazard tree) by Park personnel. Dead wood found on the ground may be gathered as firewood.

Future Actions

A. Continue to monitor the supply of downed firewood and work with PATC to develop alternative heat/fuel sources for the cabins.

B. Standardize all Park and PATC signs for the cabins.

C. Continue to monitor the grounds around the cabins for buildup of charcoal and cooperate with the PATC in educating cabin users to employ minimum impact practices around cabin areas.

6.3 PATC Huts and Maintenance Buildings

As authorized by the Concessions Permit, the PATC operates and maintains 7 huts and 3 maintenance buildings in the Appalachian Trail opportunity class. All of these structures are considered as eligible for the National Register of Historic Places. Due to consideration of AT user expectations and experience, the provision of huts is allowed and accommodates this traditional use while minimizing campsite impacts to the resources immediately adjacent to the AT. The trail user can generally expect a day's hike (8 to 12 miles) between huts.

In contrast to the PATC cabin use, those hikers using huts are required to obtain a backcountry camping permit. The hut system is intended to provide shelter only for long-term hikers (at least three nights of backcountry camping) and specifically AT long distance "thru-hikers." Except in an emergency situation, only one night's lodging is permitted per hut. The huts are operated on a first come, first served basis. Bunk space in the huts is available according to the designated occupancy capacity as signed at each hut. If a hut is occupied at the capacity limit, additional visitors must camp out of sight in compliance with backcountry regulations. Huts may have nearby designated campsites for hut user overflow, but hut area regulations and guidelines pertaining to long-term hikers and length of stay apply.

The huts are three-sided stone or log structures with wooden sleeping platforms. An open outdoor fireplace is provided for cooking, and dead wood found on the ground may be gathered as firewood. Water is generally available from a nearby stream or spring but should be treated for water-borne contaminants before using. A pit toilet and bear-proof food storage pole are provided. No other facilities are available. A copy of the hut rules and emergency notification procedures are posted at each hut.

Table 6.1

Hut Locations	District	Capacity	Approx. Mileage South of Compton Gap via AT	Approx. Mileage North of Rockfish Gap via AT
Gravel Springs	North	11	12	91
Pass Mountain	North	7	25	78
Rock Springs	Central	10	40	63
Bearfence	Central	10	51	52
Hightop	south	7	63	40
Pinefield	South	7	71	32
Blackrock	South	11	83	20

Three PATC maintenance buildings are located within the backcountry at Indian Run in the North District, South River in the Central District, and Ivy Creek in the South District. These buildings are shelters which are enclosed and locked and serve as bases of operations and tool storage depots for the PATC's ongoing trail maintenance activities. Use of the buildings is not available to the general public and visitors must camp out of sight of these facilities. PATC overseers have permitted vehicle access to cabins, huts, and maintenance buildings only for transporting building maintenance materials or supplies for scheduled trail crews. PATC vehicle travel must be kept to an absolute minimum on administrative roads. **A** PATC overseer sign should be clearly displayed on the dash of the vehicle so that the vehicle use is immediately apparant to visitors and Park employees. Additionally, larger PATC trail crews which exceed occupancy capability of maintenance buildings and cabins are allowed to use tents in grassy areas in the immediate area of the PATC facility land assignment. This use is considered to be infrequent.

6.4 Camp Hoover

Camp Hoover is a historic facility along the Rapidan River built in 1929 by President Hoover. The President's Cabin, The Prime Minister Cabin, and the Creel Cabin have been designated as National Historic Landmarks. The landscape around the cabins and the archeological remains at the former marine camp above Hoover also are part of the National Register significance.

Camp Hoover falls within the Threshold opportunity class. Until 1992, the President, Vice President, Cabinet members, and their respective staffs, and members of Congress were allowed to rent the facility. In 1996, the NPS decided to limit the future use of Camp Hoover to assure preservation of the cultural fabric. The area will continue to have interpretive significance through events like Hoover Days and other scheduled activities.

In addition to the structures, several old walking trails in the area including the Fisherman's Loop and the trail up to the Five Tents area have been re-established. A significant resource problem which has recently impacted the health of the predominately hemlock forest surrounding the Hoover strucures is an infestation of the exotic Hemlock Wooly Adelgid (HWA). Integrated pest management actions including application of pesticides have been taken, but the hemlock stand continues to decline and mortality of several trees has forced their removal. As there are currently no known long-term protective strategies available against HWA, major changes in the overstory are expected in this area.

6.5 Hazard Trees at Facilities

A hazard tree is defined as a dead tree (dead longer than two years) or a live tree with a recognizable and significant structural defect, damage or lean that is in proximity of a high-use or relatively high-use public area and which presents an imminent risk to people or property.

Much of SNP's even-aged forest has matured since the park's establishment and subsequent forest protection in the 1930's and some stands are in decline and weakened, making them susceptible to insects. disease and storm damage. In the past decade, many thousands of trees have been killed due to insect infestations (especially Gypsy Moth and Southern Pine Bark Beetle) and severe storms. In response to recognition of the hazard tree danger posed to park visitors and employees in high-use areas, a formal SNP hazard tree management policy was developed to address hazard tree management strategies.

The existence of standing dead trees is part of the natural scene across the park; given the nature of the park's mission, management objectives and funding, there is no intention to render the entire park without risk from falling trees or limbs.' Efforts to identify and deal with hazard trees are performed in a priority fashion to optimally utilize available resources. **The goal of hazard tree management is to reduce the threat of falling trees in areas of the park where**

The task is impossible, practically speaking, given the vast acreage and steady natural recruitment of standing dead trees. Even if unlimited funding were available for this purpose, we would not choose to cut down all standing dead trees since they provide important benefits to the forest ecology in the form of habitat for various forms of flora and fauna.

the most people and property are at greatest risk, and to adequately warn the public and staff of remaining dangers. "Action priority zones" have been identified to focus hazard tree mitigation activities and backcountry "development" areas including trails, campsites, structures, and roadsides are placed in the lowest priority category for action. The "relative proximity limit" is defined for backcountry developments as "when a tree or limb may fall on to a backcountry structure or other commonly used area."

Staff and visitors need to be kept aware of hazard tree dangers. Publications for backcountry users such as campers and anglers need to carry information about hazard tree dangers and advisory signs should be posted at trailheads in the vicinity of large areas of dead trees. Monitoring for hazard trees at backcountry facilities is conducted on an ongoing basis by trail crew and other backcountry personnel.

6.6 Cultural Resources

The management of SNP cultural resources is described in the RMP. The RMP describes the four types of cultural resources as archeological sites, historic structures, cultural landscapes, and archival records and museum objects. According to the RMP, the current program for cultural resources management in SNP operates with the following general priorities: (1) protect and maintain National Register properties, (2) preserve the oral and written record of the area's history, (3) preserve other historic property including archeological sites, (4) maintain historic objects and archives, and (5) conduct further research on the park's cultural history. SNP is responsible for the protection of all historic structures and archeological sites and for the interpretation of cultural resources. All of these activities are carried out with a mixture of NPS operations (ONPS), cultural and regular cyclic, and Cultural Resource Protection Program (CRPP) funding.

A brief description of backcountry cultural resources and a general history of the SNP area is provided in chapter 2. The GMP provides a Cultural Resources Survey map which indicates resources by two major themes: (1) pre-park settlement and cultural patterns and (2) federal development subsequent to park establishment.

Historic Structures

Relevant to SNP backcountry management, the three remaining cabins (President's Cabin, Prime Minister's Cabin and The Creel) and associated cultural landscape at Camp Hoover, Corbin Cabin, the Jones Mountain Cabin, PATC cabins, maintenance buildings and shelters are the only backcountry structures presently determined eligible for the National Register of Historic Places. Camp Hoover is a National Historic Landmark. The open area at Big Meadows is an historic site.

As noted in the GMP, the historic structures and sites in the park backcountry may not warrant preservation, but all are subject to individual National Register evaluation, survey, and recordation if development would impact upon them. These structures, including the remains

of homesites, mills, cemeteries, mines, churches, and hotels, have yet to be individually evaluated, although they are being allowed to melt into the landscape.

Several cemeteries are maintained in their present state and receive minor maintenance attention from descendants of mountain families. Burials are permitted until the designated cemetery size is filled. A gate key for caretakers to access some cemeteries is provided at park entrance stations. See Park Directive #90-38 (Mgmt) (rev. 9/97), Cemetery Maintenance and Use Plan.

The Snead Barn in north district is maintained in its present state by the Park. Some of the more unusual structures, such as abandoned mines and wells, may pose safety hazards to visitors. These structures might require construction of physical barricades and other measures might be taken to make them safe if problems are identified and signing is not appropriate (see 'Project Planning Clearance" below).

Project Planning Clearance

Construction or maintenance activity which involves altering or routine maintenance of an historic structure or site or ground disturbance in an area that has not been archeologically surveyed requires that project planning clearance procedures be followed. Documentation including an Assessment of Effects form must be completed and approved before a project can be performed. This documentation, in draft form, is forwarded to the Park's Cultural Resource Specialist006 Coordinator.

Future Actions:

A. Existing historic structures, particularly those not routinely maintained, should be documented and photologged to aid in protection against damage and theft.

B. "Cultural resources" should be identified very specifically so that appropriate protection of backcountry historic structures and other "traces" can be determined and performed as appropriate.

C. All exisiting structures should be evaluated for National Register Eligibility by way of either a formal determination of eligibility or as part of the List of Classified Structures survey.

D. parkwide identify all areas of potential archeological sensitivity.

6.7 Administrative Roads

There are a number of secondary, unpaved roads and right of ways (ROW) that penetrate many backcountry areas. Roads and ROW's may be maintained through cooperative agreements with the state, or through commercial use permits with utility companies, or exclusively by the Park. Most administrative roads are old "fire roads" which are primarily used for park administrative

purposes. These road surfaces consist of either natural soils or crushed stone. Many of these roads predate park establishment and may be cultural resources. At least three administrative roads evaluations have been performed by Park staff in the last several years, the most recent in 1995. Information provided by the most recent survey is used to determine the level of maintenance of specific administrative roads and some roads may be abandoned, perhaps to be maintained within the trails system that most roads are part of. Administrative roads will be evaluated for historic significance before their trace is abandoned. Abandoned roads will be rehabbed to prevent erosion.

Former roads within designated wilderness areas have been closed and allowed to become foot and/or horse trails.

Administrative Roads Management by Opportunity Class

Primitive Wilderness
No roads for the purposes of vehicle travel will be allowed within this Opportunity Class.

Primitive Non-Wilderness
No roads for the purposes of vehicle travel will be allowed within this Opportunity Class.

Semi-primitive Wilderness and Non-wilderness, Threshold Wilderness & Non-wilderness
No roads for vehicle travel are allowed in wilderness areas. Only existing administrative roads are allowed in non-wilderness areas. No new roads will be constructed.

Appalachian Trail Wilderness and Non-wilderness
No administrative roads are allowed except where the AT crosses or parallels an existing road.

Future Actions

A. Complete cultural compliance process for roads recommended for abandonment.

B. Continue to evaluate the need for existing administrative roads as trends/needs change.

C. Maintain remaining administrative roads to provide for safe travel for the intended purpose (concessionaire/employee use vs. service road use), and to protect erosion and degradation of the resource.

D. As roads are closed to vehicular traffic and become foot or horse trails, rehabilitate them to conform with current trail maintenance standards.

6.8 Backcountry Signs

Park signing in the backcountry has evolved in response to a variety of informational needs and improving sign material technology. Backcountry signs used in the Park can be categorized as the following:

1. **Trailhead signing** includes informational signs such as the "trailhead exhibit" board or cement trail post with metal band, as well as regulatory signs such as metal photo backcountry regulation signs and fishing regulation signs mounted on metal posts, "dogs prohibited" signing using international symbols, and possibly other signs. These signs can be located at Skyline Drive or at boundary access trailheads.

2. **Trail junction signing** is primarily directional, such as the cement post with metal band or routed wooden sign, but might also include a metal photo sign of an area map in a high visitor use area.

3. **Regulatory/resource protection signs** are most frequently located at trailheads, but might also be placed anywhere in the backcountry to address a specific need or problem. Such signs include backcountry regulation signs, fishing regulation signs, stream closure signs, "No Camping" posts, "NO FIRES" or "NO HORSES" stenciled on a cement post marker, "No Hunting/No Trapping" signs and miscellaneous others. These signs should be inventoried and mapped and reviewed on an annual basis by the district backcountry staff and removed when no longer needed.

4. **Site-specific signs** are typically located on formal nature trails or at popular visitor attraction points. Examples of these signs would include interpretive or self-guiding nature trail signing and safety message signing at a waterfall viewpoint.

5. **Facility signs** relate to and identify a specific backcountry facility such as a hut, shelter. or cabin. These signs are frequently posted on the structure or on metal photo signs nearby.

6. **Temporary signs** are typically posted in the backcountry to advise or warn the public of a temporary emergency closure or a hazardous condition. Temporary signs are usually posted for special situations of less than a month in duration, but might be posted for as long as a year.

The objective of backcountry signing at SNP is to provide appropriate informational signing based on opportunity class parameters while keeping overall signing at a minimum.

See Table 6.2 "Summary of Backcountry Signing Guidelines Based on Opportunity Class."

Future Actions

A. Develop a backcountry sign manual to include description of types of backcountry signs, maintenance needs and responsibilities for each type of sign specific to SNP. Such a manual should incorporate guidelines from NPS-88, National Park Service Sign Guideline.

B. Develop a review process for evaluating the effectiveness and need for signs which are temporary in nature or the exception to the above guidelines.

C. Continue GPS/GIS parkwide backcountry signs survey to complete computerized inventory database.

D. Consider placement of signing at wilderness trailheads, such as that done in USFS wilderness areas, to indicate wilderness designation to the public and employees to enhance wilderness awareness and management. This would be accomplished in conjunction with improved SNP wilderness education of the public for awareness of wilderness values and visitor expectations of risk, challenge, and opportunities for solitude in SNP wilderness.

Table 6.2

Summary of Backcountry Signing Guidelines Based on Opportunity Class

OMPONENT	PRIMITIVE WILDERNESS	PRIMITIVE NON-WILDERNESS	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS	THRESHOLD WILDERNESS/ NON-WILDERNESS	APPALACHIAN TRAIL
Trailhead signing	Signing for trail system. Minimal signing.		Signing for trail system and area.	Signing for trail system and area. Special large text signs or repetitive signs may be used in problem areas.	Signing at trailheads w/ parking areas and at north & south entry points to park.
Trail junction signing	Cement post with directional band only. No additional signing. Stenciling on posts is discouraged.	Cement post with directional band. Additional signing such as stenciling on posts as needed.	Cement post with directional band. Additional signing such as stenciling on post permitted in non-wilderness only.	Cement post with directional band. Additional signing such as stenciling on post permitted in non-wilderness only. Special text signs may be used in problem areas.	Cement post with directional band. Use AT logo on post when possible.
Regulatory/ resource protection signs	Use primarily at trailhead. May be used elsewhere for resource protection or safety. Such signs are temporary.		Use primarily at trailhead. May be used elsewhere as needed.	Use primarily at trailhead. May be used elsewhere as needed. Special large text signs may be used in problem areas.	Use primarily at trailhead. May be used elsewhere as needed.
Site-specific sigos	Should not be used.	Signs only for visitor safety in non-wilderness.		Interpretive and safety signing permitted in non-wilderness.	
Facility signs	None in wilderness.	Use as needed at facilities.			
Temporary signs	Post signs at trailhead or boundary, except in emergency conditions on a case-by-case basis.		Post signs at trailhead or boundary when possible.	Post signs at trailhead or boundary when possible. Post elsewhere as needed.	

CHAPTER 7
RECREATIONAL USES OF THE BACKCOUNTRY

The recreational uses permitted or regulated in the Park are subject to changes as research and monitoring of resource conditions and visitor experience provides Park managers with new information. The Superintendent may adjust policies and' regulations to take appropriate actions to manage backcountry impacts (authority, Title 36 Code of Federal Regulations, section 1.5, Closures and Public Use Limits). These regulations are provided in a Superintendent's compendium/compilation document, an appendix to 36 CFR, and are published annually in the Federal Register and subject to public review and comment.

7.1 Rock Climbing

As early as the 1890s, the then-existing national parks recognized mountain climbing as a legitimate recreational activity. In the 1930s, the advent of more sophisticated techniques and tools lead to the introduction of technical rock climbing. Over the years this sport has increased in popularity and remains an appropriate backcountry-dependent recreational activity. According to NPS Management Policies (1988), the NPS will:

> ". . .encourage recreational activities that are consistent with applicable legislation, that promote visitor enjoyment of park resources through a direct association or relation to those resource, that are also consistent with the protection of the resources.. . Recreational activities that may be allowed include.. . mountain and rock climbing.. . " (Chapter 8:3)

In SNP, the earliest known technical climbing was done in the late 1930s and early 1940s by members of the PATC.

Technological developments in climbing equipment and styles of climbing have evolved over the years. During the past few years, "sport" climbing has rapidly developed, which focuses on increased technical skills and has resulted in a marked increase in climbing activity in the park. On most weekends, climbers can be found around areas like Little Stony Man Cliff and Old Rag Mountain. In 1991, a guide to climbing Old Rag Mountain was published in Rock & Ice magazine, which described approximately 100 routes and listed over 150 existing routes. Several bolted routes have been developed by visitors on Old Rag, some of which are visible and adjacent to the Ridge Trail.

The increase in climbing use has led to a number of resource impacts. Motorized drills have been used in the placement of steel bolts. Natural cracks are being cleaned of dirt and small plants, and lichens are removed from rock faces with wire brushes. There is more frequent use of chisels, hammers, and glue to alter the rock. The increasing use of chalk has also made highly visible "chalk trails" on rock faces. Side trails leading to the bases of climbs are probably the most noticeable impact. Most of these side trails are down very steep slopes which are quickly becoming well worn and eroded. Additionally, concern has been expressed by the

Virginia Division of Natural Heritage that a number of threatened plant species can be found along the Catoctin formation and that climbing could have an impact on these species (see chapter 2.4): particularly one-flowered rush (Juncus trifidus), fir clubmoss (Lvcouodium selago), three-toothed cinquefoil (Potentilla tridentata), and Rand's goldenrod (Solidago randii). Additionally, peregrine falcons, an endangered species, have shown an interest in mating and nesting in popular climbing areas such as Little Stony Man cliffs. Every year since 1992 the trail and cliff areas have been periodically closed to minimize disturbance of the birds.

In order to effectively manage climbing activity and associated impacts in SNP, a climbing management plan needs to be developed as a subplan to the BWMP. This plan will need to address the five criteria for allowing recreational activities as stated in Chapter 8:3 of NPS Management Policies and will need to address NPS wilderness management directives (NPS Director's Order #41). A complete inventory of existing and potential impairment to resources should be a part of this plan as well as an inventory of climbing areas and popular routes. Controversial issues such as use of fixed anchors (bolts) in wilderness as well as non-wilderness must be addressed. An LAC approach will be developed to manage climbing. It is strongly recommended that public involvement be obtained in the development of the plan, and that the climbing community as well as botanists be actively involved in policing this activity and minimizing resource impacts while assuring good opportunities for a quality rock climbing experience at SNP.

In the interim, existing regulations in 36 CFR Parts 1 and 2, as well as the Superintendent's **Compendium/Compilation of SNP Regulations,** provide the regulatory authority to manage climbing. Present regulations address destructive activities to natural resources including physical altering of rock faces, such as chiseling, breaking loose rocks, etc., which are prohibited. Existing regulations also address other visual adverse impacts such as use of chalk by climbers on rock faces. The removal of lichen or plants from rock faces is prohibited. The use of motorized equipment (power drills) in non-developed areas is prohibited. Such use is also prohibited in designated wilderness as described in the Wilderness Act.

Applicable Regulations:

36 CFR 1.5, Closures and Public Use Limits
36 CFR 2.1(a)(1)(iv) and (a)(1)(ii), Preservation of Natural, Cultural, and Archeological Resources
36 CFR 2.12(a)(1)(ii) and (a)(3), Audio Disturbances
36 CFR 1.4, Definitions ("developed area")

Future Actions

A. Develop a Climbing Plan as a subplan to the BWMP with public involvement from organizations such as PATC Mountaineering Section, The Access Fund, National Outdoor Leadership School and local climbing enthusiasts. SNP needs to better understand and address impacts to resources associated with climbing activity and assure that actions taken are consistent with NPS recreation and wilderness management directives and guidelines.

7.2 Bicycles

Touring the Park by bicycle is a popular means of transportation and this recreational activity is steadily increasing. Current regulations state that use of a bicycle (including mountain bikes) is limited to 'Skyline Drive and developed areas. Bicycles are prohibited in wilderness and on all trails and administrative roads in the backcountry.

Mountain bikes have become a popular form of recreation for the outdoor adventurer and the demand for use within the NPS is on the rise. The potential of bicycle use within SNP has been examined. In 1992 an evaluation was conducted by the Chief Ranger to examine potential use areas and associated impacts. Based on the information gathered, the decision was made to not change the existing regulation prohibiting bike use in the park's backcountry.

Applicable Regulations:

36 CFR 1.5, Closures and Public Use Limits
36 CFR 4.30, Bicycles
36 CFR 1.4, Definitions ("bicycle")

7.3 Horse and Pack Animal Use

For purposes of clarification, horses, mules, burros and llamas are designated as pack animals according to 36 CFR 2.16, Definitions.

Although horse and pack animal use is common in the Park and may be increasing, backcountry use requires restricting pack animal use to separate conflicting recreational use and concentrate this activity to areas which can sustain horse and pack animal impacts. It is widely recognized and documented that horse use on travel routes shared with hikers and backpackers can create conflicts. Trail tread conditions are heavily impacted by horse use and horses leave waste material which is increasingly problematic as volume of horse use increases. However, horse use is a traditional use at SNP and considered to be a primitive form of backcountry travel. A system of horse trails has been established to reduce conflict among trail users and to confine pack animals to specific trail areas. The trail system is maintained to park trail standards to sustain horse use and to mitigate impacts. Riding and pack animals are restricted to use trails or routes marked with yellow blazes. Off-trail or cross-country use, except to travel to a pre-determined campsite area, is not permitted. Travel on the Skyline Drive or the road shoulder is permitted only for accessing the yellow-blazed trail system.

Riders should bring their horses to a slow walk when passing in the immediate vicinity of other people. Riding or hitching pack animals in developed areas, within the immediate vicinity of trail shelters or other public gathering areas, is 'prohibited. Pack animal use is permitted only where trails and facilities are designated for such activity. Pack animals must be tethered to hitching posts where available or constrained in such a manner that they will not damage vegetation. Grazing is not permitted. A backcountry camping permit is required for overnight use of pack animals and all other backcountry regulations must be followed. Although overnight

camping activity is permitted, resulting horse use can be highly impacting to park natural resources and is discouraged even as "minimum impact" techniques are practiced. Nevertheless, horse users are encouraged to practice Leave No Trace backcountry ethics.

Applicable Regulations:

36 CFR 1.5, Closures and Public Use Limits
36 CFR 2.16, Horses and Pack Animals
36 CFR 1.4, Definitions ("pack animal")

Future Act ions

A. Develop site bulletin to provide information on pack animal use in the Park and to educate horse users in Leave No Trace backcountry use ethics.

B. Research, select, and implement appropriate backcountry camping strategy for pack animal users (ie. limited designated sites)

C. Encourage local horse clubs/individual rider user groups to take active responsibility in trails maintenance, particularly treadwork, if the horse trail system is to be managed at an acceptable condition.

Table 7.1
Listing of trails or portions of trails open to pack animal use:

NORTH DISTRICT

Beecher Ridge Trail
Bluff Trail
Browntown Trail
Compton Gap Trail
Harris Hollow Trail
Heiskell Hollow Trail
Hickerson Hollow Trail
Hull School Trail
Jordon River Trail
Keyser Run Road
Knob Mountain Trail
Lands Run Road
Mathews Arm Trail
Mt. Marshall Trail
Neighbor Mountain Trail
Piney Branch Trail
Rocky Branch Trail
Thornton River Trail

CENTRAL DISTRICT

Berry Hollow Fire Road
Conway River Fire Road
Dry Run Fire Road
Fork Mt. Fire Road
Fork Mt. Trail
Graves Mill Road
Hazel Mt. Trail
Haze1 River Trail
Mill Prong Trail
Old Rag Fire Road
Pine Hill Gap Trail
Pocosin Fire Road
Pocosin Horse Trail
Rapidan Fire Road
Red Gate Fire Road
Rose River Fire Road
Skyland Fire Road
Skyland/Big Meadow Trail
Slaughter Trail
South River Fire Road
Stony Man Mt. Horse Trail
Stony Mt. Trail
Tanners Ridge Fire Road
Upper Dark Hollow Trail
Weakley Hollow Fire Road
West Naked Creek Trail
White Rocks Trail

SOUTH DISTRICT

Big Run Loop Trail (S. side)
Big Run Portal Trail
Browns Gap Fire Road
Gasline Road
Madison Run Fire Road
Miller Run Fire Road
Paine Run Trail
Patterson Ridge Trail
Simmons Gap Fire Road
Smith Roach Gap Fire Road
South Fork Moorman Fire Road
Turk Branch Trail
Turk Gap Trail

7.4 Pets

Nearly all units of the national park system and most state parks nationwide prohibit dogs and other pets. Unlike many natural and recreation areas, SNP does permit pets, but with some restrictions. Although SNP has traditionally permitted dogs and other pets in the backcountry, significant problems are created as wildlife is harrassed and frightened by unrestrained pets, other visitors are frightened or disturbed by unrestrained or poorly supervised pets.

Pets are prohibited on designated nature trails (see below) and on some very heavily-used day hiking trails in the backcountry. (Guide dogs and work dogs are NOT prohibited on the trails.) The reasons for the closure on these trails are to:

1. Maintain public health and safety;
2. Avoid conflict among visitor use activities;
3. Protect natural resources; and
4. Protect pets from risk of injury (see 2-b below).

The following trails are closed to pets:

1. Nature trails
   a. Fox Hollow Trail
   b. Traces Trail
   c. Stony Man Trail*
   d. Story of the Forest (Swamp) Trail
   e. Deadening Trail

* Except the section which is also part of the AT from the Stony Man Nature Trail parking lot to where the AT splits again. The “no pets” sign is still posted at the trailhead to discourage pets. However, since the remainder of the AT is open to pets, AT through-hikers are permitted to take a pet on this section of the trail.

2. Other trails closed to pets
   a. Dark Hollow Falls Trail
   b. Old Rag Mtn.: Ridge Trail and Saddle Trail above Old Rag Shelter
   c. Bearfence Trail
   d. Limberlost trail

Pets are permitted on other trails and other areas in the backcountry in compliance with the regulations set forth in 36 CFR 2.15, Pets, which are as follows:

a. Pets must be restrained on a leash, not to exceed six feet, or otherwise physically confined.

b. Pets must not be left unattended or tied to an object except in designated areas (there are no areas currently designated at SNP).

c. Pets are not allowed to make unreasonable noise that impacts park users or frightens wildlife.

Impound Policy:

The CFR regulations that apply to free-roaming dogs are listed under 36 CFR 2.15, Pets, and are as follows:

A. Pets or feral animals that are running-at-large and observed by an authorized person in the act of killing, injuring, or molesting humans, livestock; or wildlife may be destroyed if necessary for public safety or protection of wildlife or other park resources.

B. Pets running-at-large may be impounded and the owner may be charged reasonable fees for kennel and/or boarding costs and collateral (fines) for violations as appropriate.

Numerous incidents have been recorded in which deer, bear, and other wildlife have been chased, injured, or killed by dogs roaming freely within the park. Cats have also chased, injured, or killed birds and small mammals.

Dogs owned by park neighbors frequently are not under control and roam into the backcountry on a regular basis. In addition, State law permits the use of dogs for hunting on lands outside the park. Dogs used in the legal pursuit of bear, foxes, raccoons, or other game outside of the park regularly follow wildlife into the park.

All Protection Rangers should be familiar with the impound and law enforcement procedures for handling free-roaming dogs which are described in NPS-9, Law Enforcement Guideline, SNP Addendum 1.

Applicable Regulations:

36 CFR 1.5, Closures and Public Use Limits
36 CFR 2.15, Pets
36 CFR 1.4, Definitions ("pet")
NPS 9, SNP Addendum 1; Law Enforcement Guideline, SNP impound policy

Future Actions

A. Consider additional restrictions for "pet-free" areas to reduce visitor and wildlife/dog conflicts and impacts.

7.5 Fishing

The mountain streams of SNP are inhabited by a variety of species of fishes and these pristine waters provide some of the best protected strongholds for native eastern brook trout. The Park's Fisheries Management Plan (FMP) has two objectives: (1) to preserve and perpetuate native brook trout as a key component of the Park's aquatic ecosystems; and (2) to allow for recreational fishing on those Park streams that consistently produce adequate numbers of gamefish for maintaining population stability. While the FMP has not yet been revised, SNP Management now recognizes a third objective: to preserve and perpetuate the native aquatic diversity of these streams. Regulations and park policies are designed to carry out these objectives.

In accordance with 36 CFR section 2.3, Fishing, a Virginia State fishing license is required for persons 16 years old and over to fish within SNP. The following fishing regulations are applicable:

Table 7.2 SNP Fishing Regulations and Guidelines

(1) Waters All streams within Shenandoah National Park, including all tributaries, are open for catch and release recreational fishing unless (1) designated as closed or (2) designated as open for harvest. Streams designated as open for harvest are also considered to be open for catch and release fishing. Those streams that are closed or designated for harvest are listed in the compendium and the Recreational Fishing brochure.

(2) Season Streams and their tributaries designated as *Open for Harvest or Catch and Release* are open all year.

(3) License All residents 16 years and older fishing within the Park must have a Virginia State fishing license in his/her possession. A 5-day nonresident license ($6.00) may be purchased at Panorama Restaurant, Big Meadows and Loft Mountain Waysides, or from local sporting goods stores. Non-residents 12 years and older must have a Virginia license.

(4) Size Limit No trout under nine (9) inches in length may be kept. Undersized fish must be immediately and carefully returned to the water. Size limits on other species of game fishes are those established by applicable State law.

(5) Creel Limits No person may retain more than six (6) trout per day nor have more than six (6) trout in possession. Creel limits on other species of game fishes are those established by applicable State law.

(6) Only a single hook (barbed or barbless) or artificial lure may be used.

(7) Commercial Fish Guides Anyone who serves as a fishing guide or instructor for compensation must obtain an Incidental Business Permit from the Park Superintendent prior to entering the Park.

Park Streams Designated As Open For Harvest Fishing

The following streams, including their tributaries within the Park are open for harvest fishing in accordance with regulations published in the Code of Federal Regulations (CFR) and the Virginia State Fishing Regulations.

Streams	Countv
Piney River	Rappahannock
Thornton River, North Fork	Rappahannock
Thornton River, South Fork	Rappahannock
Hughes River	Madison
Brokenback Run	Madison
Whiteoak Canyon Run	Madison
Cedar Run	Madison
Rose River	Madison
Conway River	Madison/Greene South
River	Greene
Ivy Creek	Greene
Doyles River	Albemarle
Jeremy's Run	Page
Pass Run	Page
Hawksbill Creek, East	Page
Hawksbill Creek, Little	Page
Naked Creek, East Branch	Page
Naked Creek, West Branch	Page
Big Run	Rockingham
Madison Run	Rockingham
Paine Run	Augusta
Meadow Run	Augusta

Streams Designated As Closed

Fishing is prohibited at all times on the following streams, including their tributaries. No gamefish species, including trout, may be in possession at any time. These streams have been designated as long term inventory and monitoring scientific study areas and must remain undisturbed.

Stream	County
Ragged Run	Madison
Dry Run, North Fork	Page
One Mile Run	Rockingham

Recreational Fishing Guidelines

Anglers who wish to continue recreational fishing at its finest are encouraged to consider the following ethical fishing techniques for hooked fish:

(1) All fish that are to be released must be carefully handled and immediately returned to the stream. Try to release fish without removing from the water.

(2) Maintain control of fish with wet hands and only a slightly firm grip.

(3) Most importantly, avoid contact or damage to sensitive gills.

(4) Never leave litter, hooks or spent fishing line in the Park - pack it out.

Applicable Regulations:

36 CFR 1.4, Definitions ("fishing")
36 CFR 1.5, Closures and Public Use Limits
36 CFR 2.3, Fishing

Future Actions

A. Periodic regulatory review of the fishing regulations will occur as part of the Park Compendium revision process.

B. Additional public use limits and closures may be implemented due to severe weather events.

7.6 Hiking

There are approximately 500 miles of trails in the Park, including a 95-mile section of the AT. All trails are marked with a colored blazing system and directional trail posts. White blazes represent the AT, blue blazes indicate trails designated for hiking only, and yellow blazes show horse trails and administrative roads. Blazes are painted on trees and are maintained by Park personnel and volunteers.

At trailheads and junctions are concrete posts with metal bands indicating mileages and trail directions. Hikers should not depend solely on these posts and blazes, but should obtain more information from a Park contact station or map prior to beginning their hike. "Short hikes" and other specific trail site bulletins are available at the visitor centers and information stations. PATC topographical trail maps are also sold at visitor centers and information stations throughout the Park. There are numerous other publications available on hiking in and around SNP. Hikers are encouraged to stay on marked trails unless they are highly experienced and proficient with topographical map and compass use; off-trail hiking is very strenuous due to rocky and steep topography, seasonally dense vegetation, and numerous downed trees from severe storms.

Trails are maintained at various standards depending on the opportunity class within which they are managed. Hikers need to carefully plan and prepare to achieve the backcountry experience they are looking for, as trails vary widely in challenge and degrees of solitude experience. Weather changes are rapid in the mountains and hikers are often unprepared for the immediate climate differences between nearby metropolitan areas and the Park. It is important that Park employees providing hiking information are also aware of directing hikers of varying experience levels to appropriate trail areas and provide the appropriate safety information.

The popularity of day-hiking in the Park limits the possibilities of solitude some visitors are seeking. To find a sense of isolation where one can enjoy what nature has to offer without encountering other people, the experienced hiker might explore trails located within the Primitive Wilderness and Primitive Non-wilderness opportunity classes, depending on the seasonal backcountry visitor use levels.

Hiking access is available from various points along Skyline Drive and from State and private lands adjacent to Park boundary. Park boundary accesses are often difficult for the inexperienced visitor to locate, generally provide poor parking opportunities, and often create conflict with local landowners through whose land many, sometimes unsubstantiated, public accesses cross. Overuse and subsequent local landowner difficulties have resulted in closure and restrictions at many boundary trailheads. Park boundary trail access should not be encouraged due to these concerns. Chapter 13 provides current boundary access information.

7.7 Overnight Camping

A backcountry camping permit is required for all overnight campers excluding cabin users. Permits provide Park staff with the opportunity to educate visitors on minimum impact backcountry use techniques and regulations, provide safety and weather information, assist visitors in appropriate trip planning, and more. Park managers can monitor density and location of backcountry overnight use and are provided with other baseline information on backcountry visitors. Permits may be obtained at various locations in and around the Park. Detailed backcountry camping permit and additional backcountry camping information is provided in chapter 12.

Applicable Regulations:

36 CFR 2.10, Camping and Food Storage
*36 CFR 7.15 Backcountry Camping

Future Actions

"A. Special Regulations will be removed to the Park Compendium upon approval of proposed regulations; the compendium regulatory review process will be implemented and public use limits/closures will be applied.

7.8 Cross-country Skiing

Winter conditions at SNP offers a variety of cross-country ski opportunities when suitable snow conditions exist. Snowfall may vary greatly from one winter to the next and the potential for skiing opportunities from one year to the next are fairly unpredictable. No cross-country ski trails are designated or are maintained specifically to accomodate skiing. Skiing is permitted on all park trails and administrative roads and the Skyline Drive (when closed to public vehicle use). Snow conditions good for skiing in the Park generally coincide with Skyline Drive road closure due to poor Drive road surface conditions and travel access to trailheads is therefore often very limited. Generally, snow-covered administrative roads provide the best skiing opportunities. A site bulletin for each the North and Central Districts are available to suggest possible ski routes. Bulletins may be obtained from information stations.

In the North District, the local Shenandoah Nordic Ski Patrol provides area ski patrol (and foot patrol depending on snow conditions or the lack thereof) routinely on winter weekends, also providing backcountry camping permits and winter weather preparedness information to Park visitors in the Thornton Gap/Panorama area.

Applicable Regulations:

36 CFR 2.19, Winter Activities

7.9 Hang Gliding

A special use permit is required for hang gliding and is issued by completing a Form SNP-31 application and paying the appropriate fee at park headquarters during business hours. The permit is valid for one calendar year and must be in physical possession of the permittee upon launch. The user must be rated at Hang 3 (cliff launch, high altitude) or better and must have the landing site owner's permission prior to landing on private property. Approved launch sites are Dickey Hill, Hogback Mountain, and Millers Head (designated on site maps available in the compendium of park regulations). These backcountry (non-wilderness) sites are undeveloped, unsigned, and not maintained by the park. Hang gliders may not be launched elsewhere in the park and may not be landed anywhere in the park.

Local hang glider clubs include the Central Virginia Hang Glider Association and the Capitol Hang Glider Association. These clubs self-insure their members and have arranged private landowner permission for use of landing sites adjacent to the park. The Central Virginia Hang Glider Association performs launch site maintenance to meet safety needs.

Applicable Regulations:

36 CFR 7.15, SNP Special Regulation (powerless flight)
36 CFR 1.5, Closures and Public Use Limits
Virginia State Law, Title 29.1-509; Hazardous Sports Law (references landowner

liability in the use of private land as landing sites by hang gliders)

Future Actions

A. Launch sites should be monitored for resource impacts and site maintenance and rehabilitation needs. The launch site at Millers Head should be closely monitored for trampling impacts to endangered area vegetation as described in the National Heritage Report. Access trails should be maintained. Local hang glider clubs might participate in a site maintenance program addressed by a MOU.

CHAPTER 8
TRAIL MANAGEMENT

8.1 Trail System

Nearly 500 miles of trails are maintained within SNP. About 200 miles of these trails are located within designated wilderness. The park's trails vary widely in length, difficulty, access, condition standards, and types of use permitted.

The Civilian Conservation Corps and the PATC built many of the park trails between 1933 and 1942. Today, the majority of the trails are well-graded and lead to significant features, connect developed areas, or follow interesting routes. Many trails are linked together and offer a variety of circuit hikes. However, a number of the horse trails and the lesser-used foot trails follow old road beds; some of which are steep, eroded, and poorly designed. Older trails which terminated at the Park boundary and had limited or no public access were closed. Additionally, remnants of old fire foot trails which are no longer being maintained can be found throughout the Park.

Standards of maintenance on park trails vary depending on a number of factors, including the opportunity class in which they are managed, the type of trail (ie. nature trail, horse trail), whether the trail is within legislatively designated wilderness (restricting the use of power tools and affecting trail condition standards), or has other special legislation attached to it (such as the AT, a National Scenic Trail), and the level of visitor use.

Trail access and parking is primarily found along Skyline Drive. Parking areas range from large paved lots to small unmarked spaces for a few vehicles along the road shoulder. During peak times, it is not uncommon for parking lots to overflow with vehicles parked on the grass along the road shoulders. Trailhead parking along the boundary is generally very limited, particularly for horse trailers and large groups.

Types of Trails

Appalachian Trail (White-blazed)
The longest, continuous trail in the park is a portion of the Appalachian National Scenic Trail, or AT, which generally follows the ridge line for 95 miles from Compton Gap to Jarman Gap and is part of the 2,000+ mile route from Maine to Georgia (see chapter 3.5). This segment of the trail was first built between 1928 and 1932 by the PATC prior to the establishment of the Park and construction of Skyline Drive. Much of the trail was displaced and required relocation during the construction of the Skyline Drive, and currently the trail crosses the Skyline Drive at 30 places. In 1968, the entire AT was legislatively designated as a National Scenic Trail. The AT is blazed white and maintained primarily by PATC with Park staff assistance as necessary.

Foot Trails (Blue-blazed)
Foot trails are blazed blue and lead to many ridges and hollows throughout the Park. Many blue-blazed trails connect with the AT or horse trails (yellow-blazed). About 200 miles of Park

trails are included in the blue blazed system. Most of these foot trails, considered to be side trails of the AT, are generally maintained by PATC under a MOU. The Park usually assists PATC with major trail rehabilitation projects or large blowdown removals.

Horse Trails (Yellow-blazed)
Almost 200 miles of designated horse trails and administrative roads are available for horse and pack animal use. Horse trails are blazed yellow, and these are the only trails available for horse and pack animal use.

Nature Trails (not blazed)
Nature trails comprise about 8 miles of the total trail miles in the Park. Most of these trails are self-guided where the user can learn about the ecosystem with either a brochure or by reading information posted on signs along the trail. They are generally less than two miles in length and some provide a circuit. Nature trails are found near developed areas, and backcountry camping is very limited if not specifically prohibited. Pets are prohibited on all Park nature trails with the exception of the Stony Man Nature Trail.

Liiberlost Trail (not blazed)
Limberlost Trail in the Central District is the only handicap accessible trail in SNP. This loop trail is ideal for people with mobility limitations, novice hikers and families with baby strollers. The trail is 1.3 miles long and features a five foot wide hard-packed trail surface comprised of crushed greenstone. The trail gradient is less than 8% throughout, and there are reststops and wooden benches every 400 feet. The trail also features a 65' bridge which spans the Whiteoak Canyon Run and a 140' boardwalk which traverses an ecologically sensitive swampy area. Pets are prohibited on this trail with the exception of seeing-eye dogs. The Limber-lost Area is best known for its old-growth hemlock forest.

8.2 Role of the Potomac Appalachian Trail Club

The Park and the PATC have been jointly involved in the stewardship of trails since the 1930's. The PATC is a member of the ATC (see chapter 3.5) with responsibilities for maintaining the AT and many other foot trails in the Park and in Virginia, Maryland, and Pennsylvania.. The partnership between the Park and the PATC is solidified every five years in a MOU which includes the following objectives:

1. To coordinate maintenance on trails as listed in the Trail System inventory, Appendices.

2. To establish procedures for reviewing changes in the Park's trails system.

3. To correct hazardous trail conditions at the earliest opportunity.

The PATC is responsible for performing all routine and recurring trail maintenance including

blazing, trimming and removal of vegetation, clearing windfalls, and construction and maintenance of water control structures on those trails of their responsibility. The PATC recruits and obtains volunteers who adopt and oversee maintenance of trail sections. Additionally, the PATC annually organizes the Shenandoah Crew which operates during a four- to six-week period in the Park, providing one to two weeks of trails construction and maintenance in each district. The PATC also coordinates trail maintenance workshops for overseers and prospective overseers in cooperation with the Park; The PATC manages three maintenance structures (South River, Ivy Creek and Indian Run) for equipment and tool storage and as overnight facilities for PATC-sponsored work trips (see chapter 6.3).

In cooperation with other AT partners (ATC and ATPO) the PATC supports SNP with Trail Patrol and Ridgerunner programs to monitor trail conditions and to provide information and support to visitors and Park managers. As of 1998, volunteer natural heritage site monitors are working with SNP resource specialists to monitor rare plant species at selected sites along the AT to document the impacts of hiking trails on rare plant populations.

8.3 Trail Maintenance Standards

Much more than just a convenient travel zone for visitors to provide recreation and access to destination backcountry sites, trails function as a management tool to confine human use and associated resource impacts, serve to regulate access to or away from specified backcountry areas, and improve visitor safety in difficult or unfamiliar natural conditions. Although standards for trail conditions may vary, well maintained trails are important to these objectives so that resource conditions and a quality visitor experience are preserved.

Blazing

Objective: All maintained trails except nature trails and Limberlost Trail in the Park will be blazed to some extent depending on the type of opportunity class in which the trail falls. The objective in blazing is to mark the trail often enough to guide the hiker and keep the trail distinguishable, but not so often that blazes become a visual intrusion. In the Primitive Wilderness and Primitive Non-wilderness classes, blazing is not necessarily intended for the convenience of the hiker or horse user but to keep the trail distinguishable, open, and maintained for hikers of various ages and experience levels typically travelling in SNP backcountry.

General Standards for blazing:

- Use 2 " X 6” vertical rectangles.
- Place at eye-level on live trees. Avoid painting rocks.
- Use double blazes (one above the other) for sharp turns and trail junctions
- Blazes should be visible across an intersection with another trail, a stream, or road.
- Where two blazes of different colors are used on the same trail, the two blazes are to be placed side-by-side.
- Avoid overblazing.
- Cairns, metal diamond markers, etc. should not be used to mark trails.

Standards for Primitive Wilderness, Primitive Non-wilderness, and Semi-primitive Wilderness and Non-wilderness Opportunity Classes (blue- and yellow-blazed trails)

- Use blue paint for maintained foot trails; yellow paint for horse trails
- Reblaze only as necessary (generally no more than every three years) to keep blazes visible. Carefully remove excess blazing.
- No more than one blaze should be visible at any time, unless special conditions warrant (i.e. trail difficult to follow due to overgrown vegetation).
- When standing at one blaze, pick a prominent spot ahead, walk past it a short distance and blaze the next prominent spot. Blazes should be 300-500 feet apart if possible. Avoid abrupt changes in frequency.

Standards for Threshold Wilderness and Non-wilderness and for Appalachian Trail Wilderness and Non-wilderness Opportunity Classes (Blue-blazed, yellow-blazed, and white-blazed trails)

- Use blue paint for maintained foot trails; yellow paint for horse trails; white blazes for the AT. Nature trails are not to be blazed.
- Reblaze every few years to keep blazes visible and to replace missing or enlarged blazes. Carefully remove excess blazing.
- No more than one blaze should be visible at any time, unless special conditions warrant.
- When standing at one blaze, pick a prominent spot ahead, walk to it, pick the next good spot and place the blaze there. Blazes should be 300-500 feet apart. Avoid abrupt changes in frequency.

Techniques for Blazing:

- Pick prominent, large, living trees; dark-colored bark provides a better contrast for the blaze.
- Choose trees which are prominent when foliage is out (clip away low bushes or protruding branches to clear the blaze area).
- Scrape a 3” X 7” rectangle on thick barked trees.
- Rub moss and lichen off a 3 " X 7” rectangle on thin barked trees.
- Paint neatly; avoid using too much paint (it will run down the tree).
- Blaze in the direction you are hiking; walk back to blaze the other direction,
- Avoid blazing rocks.
- To avoid overblazing, err on the side of too few blazes; more can be placed later if needed.

Equipment for Blazing:

- 1 gallon bucket with bail,
- 1" brush,
- blaze paint,
- paint scraper,
- rags, paper towels, aluminum foil to wrap brush in until cleaning, etc., and
- brush cleaner and hand cleaner for afterwards.

Vegetation Maintenance

Objective: To keep trails from being overgrown with vegetation by removing branches, weeds, and brambles that interfere with passage along the trail.

General Standards:

- Width will vary with type of trail and opportunity class.
- Steep slopes with thin and unstable soils should have narrower trail tread as roots help to stabilize the slope.
- Height should be sufficient to allow a tall backpacker or a rider on a horse on yellow-blazed trails to pass,
- Cut branches flush with the main stem; shrubs and trees should be cut flush with the ground to avoid leaving hazardous stubs (see Techniques below).
- Remove debris from trail; scatter if there are large amounts.
- Do not grub or remove trailside plants; the remaining plants and root systems help stabilize the soil.

Standards for Primitive Wilderness and Primitive Non-Wilderness Opportunity Classes (Blue-blazed and yellow-blazed trails)

The purpose for trail vegetation maintenance in these areas is to keep the trail open for light travel. Visitor convenience is not a primary objective.

- Trail vegetation should be maintained to allow hikers and horse riders to pass (not necessarily in shorts) single file without contacting shrubs, weeds, briars, or branches (blue-blazed trails about l-2 feet on each side of trail; yellow-blazed trails, 2-3 feet on each side of trail)
- Trail vegetation should be trimmed as necessary in late spring; additional work during summer months may be necessary to maintain the required width and height.

Standards for Semi-primitive Wilderness and Non-Wilderness Opportunity Class (Blue-blazed and yellow-blazed trails)

The purpose for vegetation maintenance in these areas is to keep the trail open for moderate travel. Visitor convenience and safety are also considerations.

- Trail vegetation should be maintained to allow hikers and horse riders to pass for the most part easily without contacting shrubs, weeds, briars, or branches (blue-blazed trails about 2-3 feet on each side of trail; yellow-blazed trails, 3-4 feet on each side of trail).
- Entire trail should be maintained in spring and at least once during late spring; additional vegetation maintenance may be necessary to maintain the required width and height.
- Areas in front of blazes should be kept open to allow maximum visibility of blazes.

Standards for Threshold Wilderness and Non-wilderness and for Appalachian Trail Wilderness and Non-wilderness Opportunity Classes (Blue-blazed, yellow-blazed, and nature trails)

The purpose for vegetation maintenace in these areas is to keep the trail open and maintained for heavy travel. Visitor convenience and safety are also primary considerations.

- Trails should be maintained to allow hiker and horse riders to pass easily without contacting shrubs, weeds, briars, or branches (blue-blazed, AT, nature trails about 3 feet from each side of trail; yellow-blazed trails, 3-4 feet on each side of the trail.
- For blue-blazed and nature trails, entire trail should be maintained in the spring and at least once more during the summer; wet areas, old field, and other sections prone to weed and briar growth should be cleared more often if necessary. Yellow-blazed trails should be maintained at least once during late spring and more often if needed.
- Areas in front of blazes should be kept open to allow maximum visibility of blazes.

Techniques for Vegetation Maintenance:

The amount of vegetation maintenance is dependent upon the opportunity class. For primitive areas, a minimal amount of maintenance should be undertaken.

- Low shrubs and young trees are cut flush with the ground to prevent tripping and to reduce sprouting from the stump and roots.
- Trim branches 1" from the main trunk of the stems to prevent snagging passing hikers and to prevent tree injury.
- Branches growing towards the trail should be cut back to the next limb growing away from the trail (to encourage growth away from the trail).
- It is better to remove all lateral branches than to remove the tree top since removal of the terminal bud will encourage lateral growth across the trail.
- Grubbing with a cutter mattock or pulaski may be necessary to clear the tread of long neglected trails; do not remove any more vegetation than is necessary to define the tread.

Equipment:

- Long handled clippers (loppers),
- Weeders (swing blades),
- Small saws,
- Pulaskis or cutter (#3) mattocks (for grubbing out vegetation in the trail tread),
- Power weeders (except in designated wilderness areas),
- Proper safety equipment (goggles, ear protection, gloves).

Clearing Fallen Trees and Windfalls

Objectives: Perform safe removal of dangerous trees and allow passage along the trail while retaining features which contribute to trail maintenance and to user enjoyment. Timely removal of trail obstructions minimizes visitor-created detour trails which degrade the resource and complicate effective trail maintenance.

General Standards:

- Safety is the primary consideration. Do not attempt to remove large or "hung-up" trees alone. Do not exceed the capability of equipment or personal skills.
- Clearing should be done at least once each year in early spring to remove winter storm damage; additional work may be necessary during the year due to storms.
- Clear to the same width of cleared vegetation.
- Appropriate safety equipment **must** be worn (goggles, ear protection, chaps, helmet, gloves). Personnel should also protect themselves from tick infestation (long sleeves, tick repellent). Personnel should clear trees in pairs and must be checked out by a supervisor before performing chain saw work. Primitive tool crosscut saw and grip hoist work can be even more dangerous than chainsaw work in some situations; safety equipment including gloves and a helmet **must** be worn.

Standards for Primitive Wilderness and Primitive Non-wilderness Opportunity Classes (Blue-blazed, yellow-blazed trails)

- Remove only those trees, windfalls, or other obstructions which do not lie flat on the ground or which cannot easily be stepped over or walked under by a person carrying a backpack or rider on a horse.
- The cleared width should allow persons to walk or ride single file.
- In wilderness, if the width of deadfalls are so large that a tremendous amount of effort and manpower will be required to remove the deadfall, or if worker safety is seriously compromised with primitive tool work, consideration should be given to relocating the trail around the obstacle, but only as a last resort. Steepness of slope, length of detour, difficulty in getting around the obstacles are factors which should be considered. Chainsaw use under these circumstances requires parkwide project clearance and compelling evidence for use of mechanized equipment.

Standards for Semi-Primitive Wilderness and Non-wilderness, Threshold Wilderness and Non-wilderness, and Appalachian Trail Wilderness and Non-wilderness Opportunity Classes (Blue-blazed, yellow-blazed trails, nature trails)

- Remove all fallen trees, windfalls, and other obstructions from trail, except those which prevent erosion (by acting as waterbars), prevent access by vehicles at trailheads, and which can be easily stepped over without breaking stride. Trees not removed should lie flat on the ground and should be less than 12" in diameter.
- All obstructions should be removed as soon as possible (particularly from spring through autumn) to prevent danger to users and discourage hikers from walking off the trail).

Techniques for Clearing Fallen Trees:

- Remove material far enough from trail side to prevent snagging of hikers.
- Watch the tension on fallen trees; saw so the natural tension opens the cut rather than pinches the saw.
- Use pry poles or levers to relieve tension and open the sawcut.
- Drag windfalls away from the immediate sight of the trail. Try to reduce the visual impact of cut trees by turning cut ends of logs away from view of the trail. Flush cut stumps to the ground to reduce visual impact and to encourage rapid decay of the stump.

Equipment:

- Bow saws,
- Cross-cut saws,
- Axes,
- Clippers,
- Chain saws (for non-employees, use only as authorized by MOU with the Park or as advised by a district supervisor for Volunteers-In-Park personnel; chainsaws and other motorized equipment are prohibited in wilderness except as approved by Superintendent).
- Grip hoist (especially for use as primitive tool to drag trees and large rocks off trails in wilderness).

Trail Tread (Erosion Control and Prevention)

Objective: Maintain or restore a trail tread (the footpath surface) which is safe for users and prevents the deterioration of the trail resources.

All maintenance activity expected to occur outside of the original footpath and associated water control features must have parkwide project clearance completed and approved. Use of natural materials is required in trail construction work; use of dimension lumber is discouraged and use of pressure-treated or creosoted lumber is not permitted.

General Standards:

- Install grade dips or install waterbars on all slopes at a frequency sufficient to eliminate water from the trail before erosion occurs.
- Install checkdams in badly eroded trails to retain sediment and restore tread. Checkdams are less effective than waterbars.
- Keep culverts clear of silt and organic debris.
- Clear debris from streams downstream from trail crossing (to prevent damming and flooding on the trail).
- Dig channels for small streams and channels for streams to cross the trail without travelling along the trail.
- Remove accumulated silt and organic debris from waterbars in spring or when needed.
- Remove loose stone and other debris which could cause hikers to trip or twist an ankle.
- Discourage shortcutting of switchbacks by blocking shortcuts with branches and other debris. Heavy materials such as stumps or rocks might be used so that people do not remove them.

Standards for Primitive Wilderness and Primitive Non-wilderness Opportunity Classes (Blue-blazed and yellow-blazed trails)

- Annual maintenance may be sufficient; sections with unusual problems may require additional maintenance. The prevention of resource damage (erosion) should dictate the frequency of maintenance, with minimal amount of work.

Standards for Semi-Primitive Wilderness and Non-wilderness, Threshold Wilderness and Non-wilderness, and Appalachian Trail Wilderness and Non-wilderness Opportunity Classes (Blue-blazed, yellow-blazed, nature trails)

- All waterbars should be cleaned and restored at least once each year due to erosion damage and wear from heavy foot or horse traffic.

Techniques:

Waterbar construction:

- Choose locations along the trail which naturally tend to allow water to run off the trail such as turns in the trail. Restore old waterbars if possible. Place waterbars near the top of a slope to prevent water from gaining momentum.
- Construct a waterbar by digging a shallow trench at a 30-40 degree angle from the perpendicular of the trail and placing in it 10-12" rocks or a log. Strip bark from logs to slow rotting and use hardwoods like black locust. **(Do not cut standing trees for this material!)** Rocks or logs should protrude about 6" above the level of the tread on the downhill side (use a 10" to 12" diameter log). Cover rocks with small rocks and soil to create a mound. Secure logs with wooden stakes (natural stakes are preferable) or rocks on the downhill side. Cover stakes or rocks with soil and compact well. Another alternative is to construct a waterbar with well packed soil alone.
- Slope the trail above the bar gently toward the bar to create a broad trench. The lowest point of the trench should be at the bar and should be below the level of the trail tread on the downhill side. Do not expose so much of the downhill side of the waterbar that it becomes undermined by erosion.
- The waterbar should extend past the tread on both sides of the trail.
- The trench should extend beyond the waterbar and should be fanned out to assure that water is adequately dispersed and does not return to the trail.
- Drainage ditches alongside the trail may be used to move water to a suitable location for drainage away from the trail.
- Compact waterbars well so that use will not damage them. Do not leave protruding rocks or stakes which could trip a hiker.
- Fallen logs laying directly on the ground and which can be easily stepped over make good waterbars and checkdams.

Checkdam construction:

- Where a drainage waterbar cannot be constructed due to high berms on both sides of the trail, construct a simple wood or rock dam perpendicular to the trail to collect silt and debris washing down the trail. Construction should be substantial enough to prevent hikers stepping on the dam from breaking it down.

- When the area behind the dam is full, build another dam further down the slope.

Waterbar maintenance:

- Remove all loose material from the trench; clear trench outside of tread to allow water to move away from the trail.
- Dig or scoop out accumulated silt from the trench; put all accumulated soil on the back side of the waterbar. Do not throw the soil to the side of the trail. Soil is a precious commodity as evidenced by eroded trails. The bottom of the trench next to the bar should be slightly below the level of the tread on the downhill side of the bar.
- If necessary, rebuild or repair the bar itself.

Obtaining tread material:

The following are good sources for tread fill material:

- Deposited material from up-trail erosion (ie., waterbars, checkdams).
- Material from the footpath.
- Material may also be pulled from the banks or berms of the footpath area.

The source for tread material needs beyond the above must be approved by park staff. Borrow pits are not to be dug. Any disturbance of the soil beyond the trail tread, berms, and associated water control features itself must have parkwide project clearance.

Equipment:

- Pick mattock, cutter-mattock, or Pulaski
- Shovel,
- A x ,
- Saw,
- Fire rake or McCleod.

New Trail Construction or Relocations

All proposed new trail constructions or relocations must be approved by the Superintendent and are subject to the parkwide project clearance. Project project clearance must be obtained anytime the soil is disturbed outside of the existing trail tread, berms, and associated water control structures. Any trail relocations and new trails are to be constructed in a manner which promotes hiker safety and resource protection. No new trails will be constructed within designated wilderness, regardless of opportunity class.

Future Actions

A. Use Global Positioning System (GPS) to assist in trail maintenance and management.

B. Revisit, revise trail maintenance standards and review trail system requirements as storm damage impacts are assessed.

CHAPTER 9
BACKCOUNTRY CAMPSITE MANAGEMENT

9.1 Implications from Recreation Ecology Research

Recreation ecology is the study of recreational impacts to protected natural resources. Such studies generally seek to identify the type and extent of resource impacts and to evaluate relationships between use-related factors and environmental factors. This section summarizes some research findings relevant to backcountry campsite inventory, monitoring, and management recommendations.

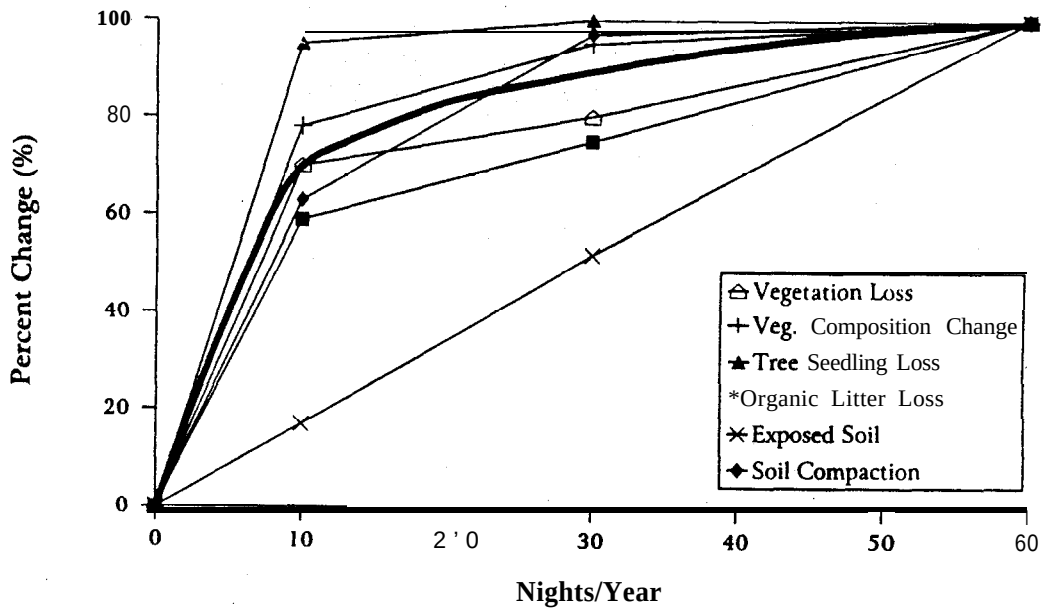
Studies of visitor impacts to both campsites and trails have documented that most resource impacts have a curvilinear relationship to level of use. In general, initial recreational use causes the most substantial changes while the rate of additional change diminishes rapidly with increasing use levels (Figure 9.1). A few impact parameters, such as loss of tree seedlings, are highly affected by very low levels of site use. At the other end of the spectrum, a few impact parameters, such as soil exposure, occur late in the impact process and appear to be related to use intensity in a more linear fashion. The majority of impact parameters, such as vegetation loss, are intermediate in their response. As depicted in Figure 9.1, research performed at the Boundary Waters Canoe Area Wilderness in Minnesota (Marion, 1987) has shown that the majority of change occurs on sites with less than a dozen nights of use per year.

Level of use is an important determinant of impact but many environmental factors (e.g. soil type and vegetation type and density) and use-related factors (e.g. type of use, party size, and visitor behavior) can be nearly as important. For example, in the Boundary Waters Canoe Area Study, vegetation ground cover averaged 52% on campsites with less than 25 % tree canopy cover, but averaged only 4% on campsites with 75100% tree cover. Sites with greater sunlight penetration support shade-intolerant grasses and sedges which, due to their growth forms, are significantly more resistant to trampling than forest herbaceous plants.

Use-related factors, over which managers typically have some control, can also be critical. Many studies have shown that on a per capita basis, hiking and camping with horses can cause several orders of magnitude more impact than hikers and campers on foot. Similarly, visitors who camp in large groups, build fires, trench around tents, and chop on trees can cause significantly more impact than visitors who obey minimum impact camping practices.

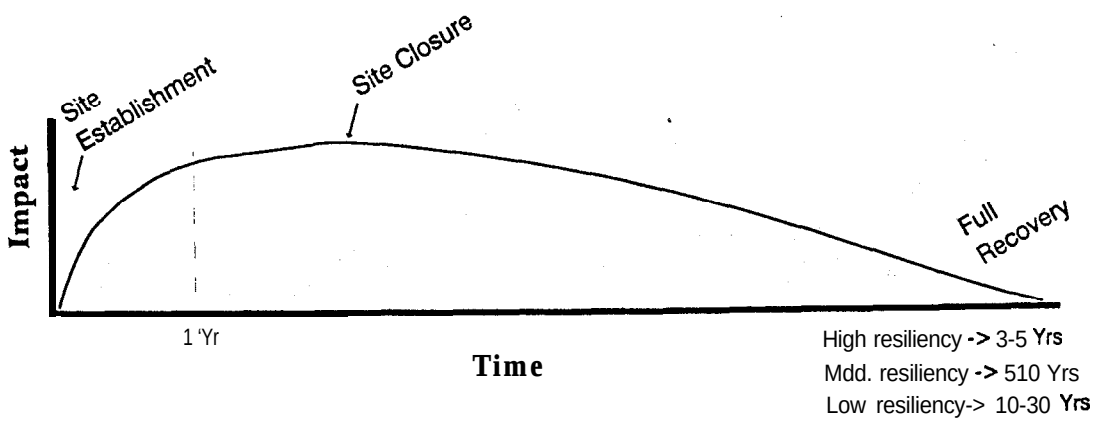
One final relevant recreation ecology finding pertains to the relationship between initial impact rates and recovery rates. Research has shown that while substantial impacts occur during the first year of a campsite's establishment, recovery rates are considerably longer (Figure 9.2). Recovery rates are dependent upon the resiliency of vegetation and soils. Vegetation resiliency is primarily related to environmental factors such as length of growing season and soil productivity. Soil resiliency is related to soil texture, soil moisture, freeze and thaw cycles, and biological activity in the soil.

Figure 9.1. Use/impact relationship for selected impact parameters from a study of campsites in the Boundarv Waters Canoe Area Wilderness.



Note: Change is expressed as a percentage of change on high use sites. Thus, approximately 70% of the vegetation loss that occurs on campsites receiving 60+ nights/year has already occurred on campsites receiving 10 nights/year. The generalized curvilinear use-impact relationship is depicted by the thicker black line.

Figure 9.2. A comparison of campsite impact and recovery rates.



9.2 History and Evaluation of SNP Campsite Management

SNP has experimented with each of the four major campsite management strategies: unregulated **at-large** camping, **visitor containment, visitor dispersal,** and **area closure.** The effectiveness of these alternative strategies is dependent upon how they are applied and requires an understanding of recreational ecology knowledge that, until recently, was poorly developed. The discussion that follows evaluates how these strategies have been applied at SNP.

Prior to 1972 the park appears to have permitted unregulated **at-large** camping in the backcountry. Under this management strategy, visitors camp wherever they want with few or no regulations regarding campfires or other camping practices. Such unregulated camping was quite common in the past and is still permitted in many lightly used NPS units today. While at-large camping maximizes visitor freedom, it is generally appropriate only under low levels of use due to the relatively high potential for resource impacts. When SNP's backcountry use expanded to 34,000 in 1967, managers judged the resulting resource damage to be unacceptable and implemented a **visitor containment** strategy with 39 designated campsites in 1972.

All visitors, without limits on number of groups, group size, or total capacity, were required to camp within sight of red camping posts or at backcountry shelters. Such regulations guaranteed excessive crowding, conflicts, and resource damage. Backcountry use reached 121,000 by 1973, three times the current visitation (see chapter 2, Table 2.1). It is not surprising that such use overwhelmed the 39 designated camping areas. This strategy was abandoned in 1974 with implementation of a **visitor dispersal** strategy initiated through the establishment of new regulations (see chapter 1, Table 1.1).

Under the dispersal strategy visitors were encouraged to camp away from trails, streams, shelters, roads, developed areas, and other groups. In addition, permits were required, group size was limited to 10, camping stays at each site were restricted to two consecutive nights, and some low-impact camping information was communicated. While more effective than the previous strategies, this approach works best only under conditions of low use. In its purest form, visitor dispersal seeks to minimize visitor impacts (and social problems) by distributing visitor use to such a large number of "sites" that none develop any obvious signs of wear. The extremely low trampling resistance of most forest ground vegetation communities tolerate very little camping activity and is often eliminated by more than 5-10 nights of use per year. The "capacity" of more open grassy vegetation types can support much higher use, perhaps as much as 15-20 nights per year (Marion, 1992).

Current and past experience has shown that SNP's dispersal regulations have been largely unsuccessful in dispersing visitors camped in the backcountry. An extensive campsite inventory completed in 1983, nine years after implementation of the dispersal regulations, revealed approximately 1,300 identifiable campsites. More importantly, 80% of these campsites were judged to be in violation of the "within sight of trail" regulation, and 25% were in violation of the "within 25 feet of streams" regulation (Marion and Haskell, 1988). A decade later, a second, more comprehensive survey located approximately 700 campsites, 68% of which were judged to be in violation of one or more locational regulations (Tables 9.3, 9.4, and 9.5)

(Marion and Williams, 1993). Furthermore, 80% of the campsites were "obvious" and 35 % had lost nearly all of their vegetation cover and had bare soil exposed in core areas. The results of these surveys indicate that visitors have not been sufficiently dispersed to avoid the creation of recognizabie campsites or even the loss of organic litter and exposure of bare soil.

Management efforts to achieve backcountry camping dispersal have been unsuccessful, both in SNP and elsewhere, due to a number of factors. Visitor behavior is perhaps the most significant factor. Many, perhaps most, visitors simply do not want to disperse beyond sight of trails and other groups, away from water or to locate and camp on previously unused sites. Many visitors enjoy camping close to other groups for social reasons, others fear getting lost when out of sight from trails, and some may simply feel too tired at the end of a long hike to extend the necessary effort to locate a legal campsite. From a visitor's perspective, pre-existing campsites are also more convenient, comfortable, and require less work to use. Finally, water and other scenic attractions in the backcountry will always attract larger numbers of visitors than less interesting areas. All studies of unregulated visitor distribution in backcountry and wilderness areas have found use patterns to be highly uneven. Management efforts to alter these natural tendencies through regulations are perhaps doomed to failure without substantial and prohibitively expensive educational and law enforcement programs.

A second major factor which explains poor dispersal success in SNP is the mountainous topography. Many of the Park's trails follow the bottoms of drainages where flat terrain adjacent to streams permits good opportunities for camping. Unfortunately, many of the trails parallel these streams so closely that regulations prohibited camping in most of the best locations. These are also areas commonly containing cultural resources. Prior to changes in legal camping locations, more than 25 feet from streams and out of sight of trails, legal camp sites were uncommon along such drainage bottom trails due to excessive slopes. Prior to 1997 regulations changes, a difficult burden was placed on visitors to find legal campsites in many areas of the Park.

Results from the 1992/93 campsite survey (Table 9.5) suggest that the dispersal policy at SNP appeared to cause considerably more resource impact than necessary. The curvilinear use/impact relationship and various barriers which inhibit visitor dispersal contribute to the conclusion that the most effective campsite impact minimization strategy is visitor containment (designated sites), at least in areas receiving heavy use. Under a visitor containment strategy, aggregate impact can always be reduced by limiting the total number of designated sites. However, a number of factors act to limit the extent to which containment is appropriate. The resource impacts of extremely concentrated use, as shown by SNP's own history with this type of policy, quickly reach levels which are unacceptable to both managers and visitors alike. Vegetation and organic litter loss are generally recognized as unavoidable on designated sites and these changes are reversible over fairly short periods of time. A more significant and unacceptable resource impact is soil erosion, which, in contrast to other campsite impacts, is not self-limiting and represents a more lasting form of resource deterioration. The concentration of use on fewer and fewer sites also compounds problems with social crowding and conflicts. While designated single-party campsites located out of sight from each other is the most effective policy for ensuring visitor solitude, there must be enough sites to accommodate groups for any given night.

The final campsite management strategy, **area closures** to camping, was implemented in 1977 for a number of popular backcountry areas. Such closures were applied primarily to areas which received heavy day and overnight visitation, both to avoid resource impacts and to ease crowding and conflict. On a smaller scale, area closures have been established for individual campsites through the placement of "No Camping" posts on heavily impacted illegal campsites. From a resource perspective, area closures are effective when areas which are particularly sensitive to visitor impacts are closed and use is shifted to more resistant environments. Otherwise, area closures have the temporary effect of resolving problems only to have them reoccur a few years later in the new areas receiving the additional use. From a social perspective, area closures can effectively resolve crowding and conflict by geographically separating camping activities from day users. In this instance the issue of fairness, which type of backcountry use is being removed, is the primary concern.

A rest/rotation campsite management strategy is almost always inappropriate due to the large ratio of impact to recovery rates (Figure 9.2). In an area of moderate resiliency such as SNP, a campsite impacted in one year might require 5 years to recover. A rest/rotation program would therefore require 4 campsites in various stages of recovery for each campsite in use. Few areas have sufficient resiliency and numbers of potential camping locations to support such a program and visitor compliance would be particularly difficult to achieve.

Table 9.3. Number, size, and amount of soil exposure on campsites by Condition Class.

Condition Class	Campsites		Campsite Size (ft^2)	Area of Soil Exposure (ft^2)
	Number	Percent		
1	141	20	229	0
2	306	45	328	0
3	164	. 24	644	163
4	69	10	757	448
5	4	1	1765	1573
	685			
2.2	-- Averages --		434	271

Table 9.4.

CONDITION CLASS DEFINITIONS

Class 1: Campsite barely distinguishable; slight loss of vegetation cover and /or minimal disturbance of organic litter.

Class 2: Campsite obvious; vegetation cover lost and/or organic litter pulverized in primary use areas.

Class 3: Vegetation cover lost and/or organic litter pulverized on much of the site, some bare soil exposed in primary use areas.

Class 4: Nearly complete or total loss of vegetation cover and organic litter, bare soil widespread.

Class 5: Soil erosion obvious, as indicated by exposed tree roots and rocks and/or gullying.

Table 9.5. Number and percent of illegal campsites by campsite legality factor.

Campsite Legality Factor	Illegal Campsites	
	Number	Percent
<1/2 mi. from developed park areas or < 250 yds from paved roads	33	5
< 25 ft. from streams	172	25
In sight of formal park trails	396	58
In sight of "No Camping" signs	49	7
Total number of illegal campsites, any factor	463	68

9.3 Backcountry Campsite Management Strategies

Park managers have a dual mandate to provide quality recreational experiences and protect cultural and natural resources and processes. The management of backcountry recreational use necessitates a compromise between these mandates because impacts are an inevitable consequence of use. Managers must strive to minimize rather than eliminate recreational impacts, with consideration given to both individual site impact, aggregate impact, and the costs to visitors of compliance. These factors, as well as management, environmental, and use-related factors which determine the effectiveness of campsite management strategies, must be evaluated in the formulation of a comprehensive campsite management program.

Campsite Management Recommendations for Actions Beyond 1997

The consideration of alternative campsite management approaches will begin with a review of potential alterations to current policies. For reasons discussed previously in this chapter, reliance on a dispersal strategy alone is not recommended. Dispersal has the potential to work well in many areas of the Park which receive low use. The success of this strategy could be increased through Leave No Trace educational efforts that emphasize site selection criteria promoting the selection of legal and impact resistant campsites. Interpretive efforts might also effectively reduce some forms of impact, such as tent ditching, campfire building, and tree damage, that are more strongly related to depreciative behavior than visitor numbers. Improved low impact information conveyed through brochures and trailhead posters could increase the effectiveness of the current dispersal strategy at little cost. Expanded personal communication of low impact information through the permitting process, interpretive talks, and ranger patrol contacts in the backcountry represent more effective but higher cost educational approaches.

Some form of visitor containment needs to be incorporated into the current system to reduce impacts in moderate to heavy use areas. Recreation ecology researcher David Cole has advanced an educational approach which encourages dispersal in remote areas and containment in more popular areas. Visitors who know and want to apply low impact camping practices are instructed to locate and use pristine, impact resistant sites, using care to avoid damage and to naturalize the area following use. Visitors in more popular areas are instructed to locate and use moderately impacted campsites. Visitors are directed to avoid lightly impacted sites, as their use will rapidly result in higher impacts, and highly impacted sites, as their use will prevent the recovery of impacts which have reached unacceptable levels. This educational approach is based on recreational ecology relationships (Figures 9.1 and 9.2) and has been implemented in a number of U.S. Forest Service wilderness areas. However, its effectiveness is unknown and at least one study found the educational message to be too difficult for visitors to comprehend and apply in the selection of appropriate campsites.

A more regulatory but potentially more effective alternative is the use of designated campsites in popular backcountry locations. Under this approach, small clusters of impact resistant designated campsites would be established in areas with concentrated use where the current dispersal system is ineffective. The number and location of designated sites would be determined through examination of trail use data, the number, distribution, and condition of

existing campsites from monitoring data, and field reconnaissance work. Designated camping regulations can be restrictive on visitor freedom, so an alternate form of containment is also envisioned. In moderately used areas, visitors might be instructed to camp on existing legal (established) but non-designated campsites. This offers visitors greater flexibility in choosing their camping locations, yet encourages the repeated use of a limited number of sites. Dispersed camping, with an emphasis on the selection of previously unused sites, might also be permitted but would be encouraged only in lightly used areas.

The LAC planning and management model, being incorporated into this BWMP, will provide an overall decision making framework for the implementation of these camping options. Which options are emphasized would be primarily dependent upon ROS class designations.

Campsite Management Recommendations bv Opportunity Class

While more complex than the present camping policy, the proposed policy combines elements of both the containment and dispersal strategies in a way that maximizes both resource protection and visitor freedom. Furthermore, a more flexible and effective response to changes in amount, type, and distribution of use is permitted. Under the LAC framework, significant increases in use and impacts will trigger careful assessments of causes, and following such an analysis, an evaluation of a range of corrective management actions. Such actions include the extent of educational efforts, campsite rehabilitation, backcountry patrols, and regulation enforcement efforts; the number and type of regulations; management emphasis among the three backcountry camping options; use limitation; and area closure. In general, indirect management actions which are least intrusive to the backcountry visitors' experiences, such as visitor education and campsite rehabilitation, are preferred over more direct actions. Management judgement will be paramount in the selection of preferred actions, however, as the extent, complexity, intensity, or visibility of problems vary. Management objectives, which guide the appropriateness of alternative management actions, also vary by opportunity class. It is also important to note that diminishing use levels and impacts should lead to a reversal of those policies which unnecessarily restrict visitor freedom. Improving conditions, as indicated by monitoring, should alert managers to consider rolling back previously implemented actions to maintain a balance between resource protection and recreation objectives. Preferred responses to increasing levels of use and impact are also presented below by opportunity class.

Appalachian Trail Wilderness and Non-wilderness

This opportunity class includes the entire AT and receives moderate to fairly intensive use, depending on location. The preferred form of camping for 'long-distance AT hikers are the huts which exist every 10-15 miles along the trail. The preferred form of camping for other AT hikers is the use of designated campsites in heavily used areas and existing legal sites in moderately used areas. Dispersed camping would also be permitted although not emphasized. Specific backcountry camping requirements are provided to park visitors by site maps/bulletins.

The following actions or enhancements to existing programs, ranked in approximate order of preference, would be considered under conditions of increasing use and impacts:

1. Information and education,
2. Backcountry patrols and visitor contacts,
3. Regulations enforcement,
4. Campsite rehabilitation,
5. Increase number of designated campsites,
6. Eliminate dispersed camping option,
7. Eliminate existing legal (established site) camping option,
8. Restrict use through travel zone or campsite rationing system.

Threshold Wilderness and Non-wilderness

This opportunity class is typically adjacent to developed frontcountry areas and receives intensive use. The preferred form of camping is the use of designated campsites in heavily used areas and established legal sites in moderately used areas. Camping may be restricted to using only designated sites in some of the most popular areas. Dispersed camping would not be permitted in this opportunity class.

The following actions or enhancements to existing programs, ranked in approximate order of preference, would be considered under conditions of increasing use and impacts:

1. Information and education,
2. Backcountry patrols and visitor contacts,
3. Regulations enforcement,
4. Campsite rehabilitation,
5. Increase number of designated campsites,
6. Eliminate established site camping option in additional areas,
7. Eliminate established site camping option entirely,
8. Restrict use through travel zone or campsite rationing system.

Semi-primitive Wilderness and Non-wilderness

This opportunity class is intermediate between Threshold opportunity class areas and the truly remote areas of the backcountry. The preferred form of camping is the use of established sites, although use of designated campsites may be required in the more popular areas. Dispersed camping would also be permitted although not emphasized.

The following actions or enhancements to existing programs, ranked in approximate order of preference, would be considered under conditions of increasing use and impacts:

1. Information and education,
2. Backcountry patrols and visitor contacts,
3. Campsite rehabilitation,
4. Regulations enforcement,
5. Increase number of designated campsites,
6. Eliminate dispersed camping option,
7. Reduce emphasis on established site camping option, eliminate option in some areas,
8. Restrict use through travel zone rationing system.

Primitive Wilderness and Primitive Non-wilderness

These two opportunity classes include the most remote and lightly used areas of the backcountry. The preferred form of camping is the use of dispersed camping, with an emphasis on the selection of previously unused camping locations and the use of low impact camping techniques. Camping on established sites would also be permitted but discouraged.

The following actions or enhancements to existing programs, ranked in approximate order of preference, would be considered under conditions of increasing use and impacts:

1. Information and education,
2. Campsite rehabilitation,
3. Eliminate established sites camping option,
4. Restrict use through travel zone rationing system.

Regardless of opportunity class, areas of the backcountry could be closed to all camping which are particularly susceptible to impacts, contain critical wildlife habitat, contain vulnerable cultural resources, or support rare, endangered, or threatened species. In addition, special provisions are recommended, limited to the Threshold opportunity class, to accommodate some recreational uses that are deemed appropriate but have a higher potential for resource damage. Large groups who demonstrate a need for primitive backcountry group camping experiences might be served by developing several clusters of designated campsites (party size limited to 10/site) for use on a reservation basis. Visitors wishing to camp with horses might be accommodated by developing several special horse use campsites, also for use on a reservation basis.

Proposed **Backcountrv Camping Regulations**

Proposed new backcountry camping regulations are presented in Table 9.6. While some regulations apply to the entire backcountry, others are specific to each of the three camping options. Another significant change from former regulations is the replacement of “within sight” camping restrictions by distance restrictions. This is recommended because: 1) visibility assessments are inherently variable and dependent upon time of year and exact positioning and color of tents, 2) over half (1992/93 Campsite Inventory) of the existing campsites are illegal because they are within sight of formal trails, and 3) “within sight” restrictions are subjective and difficult to enforce. The establishment of a minimum 20 yard setback from forma! trails for designated and established campsites should preserve hiker and camper solitude while permitting an expansion of the number of “legal” camping locations. Where convenient, distance restrictions are communicated in yards due to their close correspondence to the typical human stride, thus facilitating their application by visitors and enforcement by rangers.

Table 9.6. Backcountry Camping Regulations

NOTE: Enforceable regulation statements are in **bold.**

	Parkwide Backcountry Camping Regulations
1.	**Backcountry camping permits are required.**
2.	**Group size is limited to 10 people.**
3.	**Campfires are prohibited** (except at fireplaces at huts and shelters).
4.	**Store food so wildlife cannot have access to it. Hang food in a tree at least 10 feet above the ground and at least 4 feet from the tree trunk.**
5.	Protect water resources. **Camp at least 10 yards from any stream.**
6.	Protect cultural resources. **Camp at least 50 yards from standing building ruins such as stone foundations, chimneys, log walls, etc.**
7.	Provide for solitude. **Camp at least 50 yards from another camping party or "no camping" post.**
8.	**Camp at least 100 yards from a hut, shelter, or cabin.** The park limits camping at huts to long term hikers (trip duration of 2+ nights in park) and one night stay. Shelters are for day use only.
9.	**Camp at least 1/4 mile from Skyline Drive and park boundary. Camp at least 1/2 mile from a park facility such as campgrounds, picnic areas, visitor centers, lodges, wayside restaurants, and Camp Hoover.**
10.	Use good toilet habits. **Relieve yourself at least 20 yards from streams, trails, or roads. Bury solid human waste in a hole at least three (3) inches deep.**
11.	**Pets must be leashed at all times. Pets are not permitted on some trails.**
12.	**Carry out all trash.** "Pack it in. Pack it out."
	Established Campsite Regulations (high & moderate use areas)
1.	**Camp** in an existing campsite **at least 20 yards from a park trail.**
2.	**No more than two (2) consecutive nights in the same location.**
	Dispersed Campsite Regulations (low use areas)
1.	**Camp** in an undisturbed area **at least 50 yards from a park trail.**
2.	**No more than one (1) night in a single location,** defined as within 50 yards from the previous site.
	Designated Campsite Regulations
1.	**Camp and cook in designated site.**
2.	**No more than two (2) consecutive nights at a single campsite.** Designated campsites are found in the following areas: currently none.
	No Camping Zones (Day use only)
1.	Four areas designated as outstanding natural areas are closed to camping: Old Rag Mtn. above 2800', Summit of Hawksbill Mtn., White Oak Canyon between upper falls and Cedar Run Link Trail, and Limberlost Trail area.

Programs Needed to Support Proposed Campsite Management Policy

Four management programs are viewed as essential to the success of this proposed campsite management policy:

1. The LAC and ROS models provide an excellent framework to guide management decision making. These models, incorporated into the BWMP, provide for a more objective yet flexible approach to backcountry management.

2. An improved program emphasizing staffed permit issuance is needed to effectively implement the proposed campsite management policies. The new policies are more effective and flexible but these advantages are dependent upon the park staff's ability to reliably communicate them to backcountry visitors.

3. A permanent program of campsite monitoring is viewed as critical for a number of reasons. Monitoring will enable managers to identify and quantify resource impacts as amount and type of use changes over time. Monitoring thus provides an objective method for comparing conditions to management standards reflecting the limits of acceptable change. Monitoring data can be analyzed to help evaluate the causes of problems and to identify effective management actions, and over time, the effectiveness of implemented actions. Finally, monitoring data can be used to identify and assign priorities to campsite rehabilitation efforts.

4. A capability to locate, establish, and maintain impact-resistant designated campsites and to rehabilitate existing legal and dispersed campsites is needed. Procedures to accomplish these objectives have not been developed and may require additional research or management experimentation. Parkwide project clearance is required for each proposed designated campsite.

Selection and Management of Designated Campsites

The BWMP recommends that formal designated campsites be considered as a management option in all but the Primitive Wilderness and Primitive Non-wilderness opportunity classes. Designated campsites might be needed in the following situations: (1) in the most popular backcountry areas that receive high overnight visitation, (2) in areas that receive moderate overnight visitation but management experience and monitoring data show that the "established site" camping option has been ineffective in controlling resource or social impacts or illegal camping, (3) in areas, regardless of use level, where camping is considered appropriate but the sensitivity of natural or cultural resources requires camping only in designated sites, or (4) to accommodate particular types of use, such as horseback riders or larger groups, which require special facilities. Project clearance, including potential disturbance of sensitive natural, cultural, and archeological resources, is required prior to creation of any new designated campsites.

Pit toilets may be necessary at high use designated sites to minimize human waste impacts. Their need may be determined through management judgement or by monitoring following site

establishment. The appropriateness of pit toilets in wilderness, particularly larger enclosed structures, should also be carefully considered. Bear poles or storage lockers for safeguarding food may also be needed at designated campsites to prevent the attraction of bears.

Designated campsites may be available on a first-come, first-served basis or, where necessary, by reservation. Site reservation systems substantially restrict visitor freedom and will be avoided where possible. Visitors must be warned that a limited number of designated sites exist in popular areas and to allow time for further travel when these sites are full. Where possible and appropriate, site numbers should be adjusted to accommodate the number of groups seeking to camp during average high use periods (not peak use periods).

Designated Campsite Selection Criteria

It is proposed that designated campsites be developed either singly or in clusters of up to three to five campsites. Figure 9.7 illustrates one possible arrangement in a typical valley bottom setting. Social trail development is minimized by placing campsites out-of-sight from the trail and on the opposite side of a stream. A signed and improved access trail and stream crossing will help prevent formation of multiple access trails. Individual site access trails approach directly from the stream, anticipating the need for easy access to water. Separation of sites by at least 20-40 yards will enhance solitude. Placement of other facilities such as pit toilets or food storage facilities should also anticipate and minimize the development of additional trails.

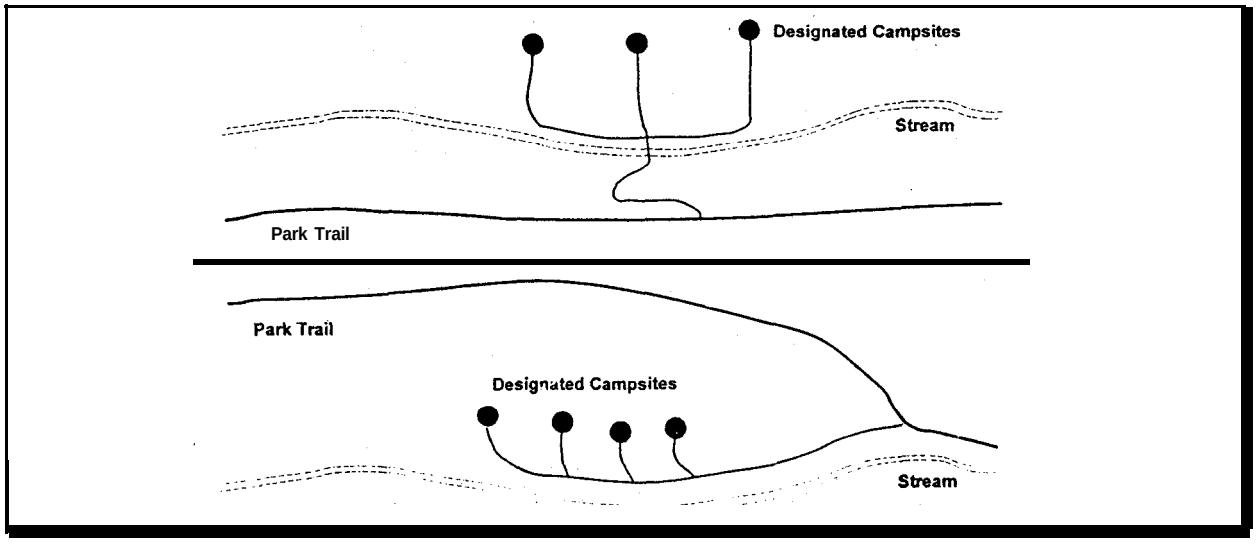


Figure 9.7. Illustration of a typical arrangement for the placement of designated campsites.

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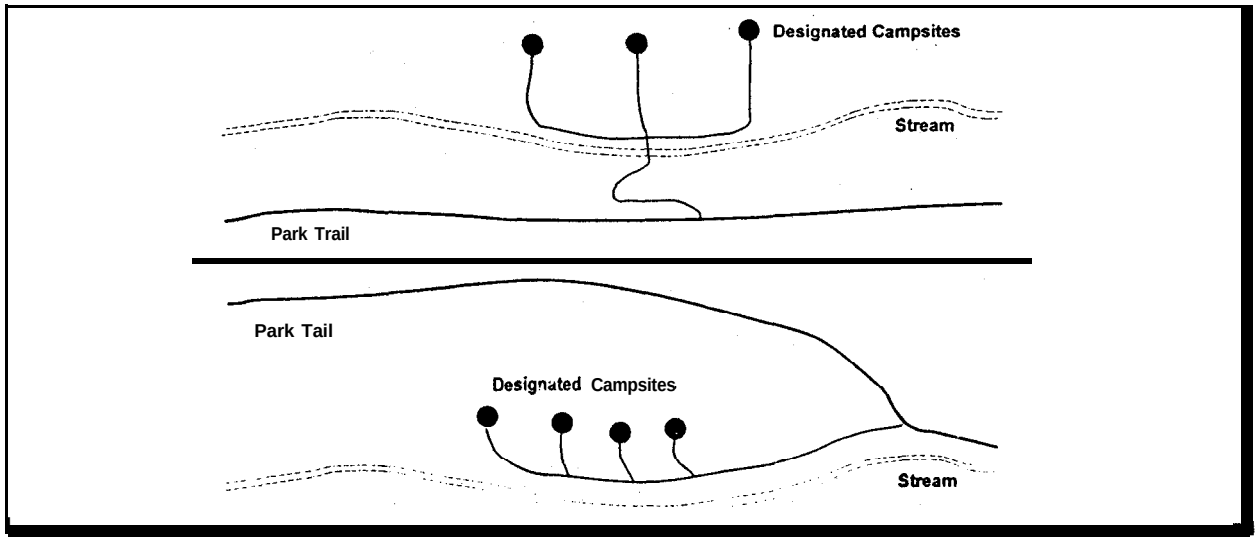


Figure 9.7. Illustration of a typical arrangement for the placement of designated campsites.

Campsite selection criteria (Table 9.8) are designed to favor campsites that will be recreationally durable and ensure visitor solitude, although other factors are noted and must be considered. These criteria should be periodically reviewed and modified as needed, particularly as monitoring data reveals how different campsites stand up to intensive or long-term use. Management experience and research in other areas shows that a few types of changes are particularly troublesome on designated campsites that receive intensive use. The following section discusses the selection criteria and offers recommendations for managing campsites to minimize these problems.

Campsite location criteria ensure adequate spacing from formal park developed areas, boundaries, trails, between campsites: and from water resources. Ideally campsites should be located out-of-sight from formal park trails and from other campsites to enhance the solitude of both hikers and campers. However, steep slopes make achieving this goal a challenge so criteria are based primarily on distances. Campsites should also be located to minimize the development of additional trails. Access trails should be designed and constructed to avoid resource impacts and the development of user-created trails. Campsite access trails might be marked with small camping symbol signs or with paint blazes and should exit the park trail in a perpendicular fashion. Trails should anticipate and accommodate the need for easy access to water sources and to toilets or food storage facilities when present.

Campsite expansion criteria emphasize selection of sites with limited expansion potential due to steep slopes, rockiness, dense vegetation, or poor drainage. A critical goal of site selection is to identify site locations that will be unable to expand even under conditions of repeated heavy use. In the ideal situation sites with natural barriers to expansion are located and used. However, such occurrences are rare and other options are frequently needed:

1) Place campsites in areas where the prevailing slope is approximately 7 to 12 percent. A minimal amount of cut and fill work* can create small campsites that have more gentle slopes of two to three percent, yet the steeper off-site slope effectively prevents campsite expansion.

2) Place campsites in extremely rocky areas where rock removal and the addition of soil can create small campsites that cannot expand.
3) Firmly anchor a 4x4 campsite post and encourage or require visitors to place tents and cooking areas within a specified distance (10 yards) of the post.

* Note: Soil disturbance or removal requires cultural resource compliance and archeological survey. Archeological survey is not required in areas with slope of + 15% or in proven previously disturbed areas. Fill can be imported to areas with vehicular access.

Campsite development and maintenance work can limit campsite expansion by ensuring the existence of two or three adequate tenting locations (10 x 10 feet) on each site. These locations should be improved where necessary by leveling soil to create a two to three percent slope, and removing or covering rocks, stumps, or exposed roots. Camping in adjacent off-site areas can be discouraged by partially burying large rocks or by digging shallow pits (***note** cultural resource compliance requirement) in some areas and mounding soil in others.

Campsite slope criteria favor sites with a gentle slope (two to three percent) that facilitate drainage yet minimize soil erosion. Slope is a critical factor influencing erosion potential because intensive trampling on designated sites causes them to lose most vegetation and organic litter and expose soils. Campsites with naturally ideal slopes are preferred (and awarded preference points) over sites where cut and fill work would be needed to create such slopes. Just as on trails, routine maintenance should evaluate and correct any drainage problems that develop over time on campsites.

Vegetation composition and vegetation cover criteria favor sites with impact resistant vegetation or areas that have little vegetation to lose. The most resistant campsites are those under open overstories supporting a grassy ground cover. Unfortunately such areas are relatively rare. Research results also indicate that campsites with a northern aspect or located in oak forests lose least amount of vegetation cover. Vegetation loss can be minimized by selecting sites under particularly dense forest canopies. Such areas often have less than 20 percent vegetative ground cover and thick organic litter horizons. Campsites placed in these areas have less vegetation cover to lose, are not visually obvious, and have thick organic layers which minimize soil exposure. Furthermore, the high organic litter production of dense forest canopies annually renews organic materials that cushion compactive forces and reduce the potential for soil compaction.

Tree damage, while a common problem associated with designated site camping, is not addressed by site selection criteria because tree damage is primarily a function of visitor behavior. Campsite regulations prohibiting campfires and educational ***Leave No Trace*** camping information should adequately resolve this problem. Damage to trees from visitors hanging food bags can be addressed through the provision of bear poles on some or all designated campsites. The unauthorized use of axes and saws in backcountry should be discouraged or perhaps regulated.

Table 9.8 Campsite selection criteria.

Points	Campsite Selection Criteria
	1. Campsite Location
Required	Campsite is located greater than: ½ mile from a park facility (other than shelters); 1/4 mile from Skyline Drive or park boundary; 23 yards from a formal park trail, campsite, camping prohibition sign; 50 yards from standing building ruins (ic. foundations, walls, chimneys); 10 yards from any stream or water source.
1	Campsite is located out of sight (in summertime) *or* more than 40 yards from any other campsite or hut/shelter/cabin..
1	Campsite is located out of sight *or* more than 40 yards from a formal park trail.
1	Campsite is located more than 20 yards from any stream or water source.
	2. Expansion Potential
3	Poor expansion potential: off-site areas are completely unsuitable for any expansion due to steep slopes, rockiness, dense vegetation, and/or poor drainage.
2	Moderate expansion potential: Off-site areas moderately unsuitable for any expansion due to the factors listed above.
-1	Good expansion potential: Off-site areas are suitable for campsite expansion, features listed above provide no effective resistance to campsite expansion.
	3. Campsite Slope
Required	Most areas of the campsite have gentle slopes (2-4%) or they can be easily created.
1	Most areas of the site already have gentle slopes.
2	**4. Vegetation Groundcover**
	The composition of ground vegetation in off-site areas is predominantly grasses or sedges, as opposed to broadleafed herbs, ***or*** off-site vegetation cover is very sparse (less than 20%).
1	**5. Forest Canopy**
	The composition of the forest canopy in the campsite 'area is predominantly oaks.
1	6. **Aspect**
	The landform upon which the campsite is situated has a northerly aspect.
	7. Pre-existing Campsite
1	The area contains a pre-existing campsite with acceptable characteristics.

Applying Selection Criteria

Once a decision has been made to establish new designated campsites the site selection process begins with a review of any cultural sites or critical habitat for R,T&E species or other important wildlife known to occur in the vicinity of the proposed campsites. Though exemptions may be granted, designated campsites will generally not be placed in close proximity to sensitive cultural or natural resources, Other site selection considerations not included in the Table 9.8 criteria include such factors as proximity to water sources and visitor attractions, aesthetic appeal, visitor safety, and visitor distribution patterns.

The campsite selection criteria in Table 9.8 will be applied during field reconnaissance surveys to identify and rank potential designated campsite locations. As a general rule, twice the number of desired new site locations should be identified and rated to ensure the search is thorough and that the most highly rated sites are selected. Pre-existing sites should be used whenever possible but only when they score highly on site evaluation criteria. Common but critical deficiencies of many existing sites is their proximity to trails, water, and other sites and a strong potential for expansion. Responsibility for this work would be assumed by district backcountry rangers, who would also prepare campsite proposals to be approved on a case-by-case basis. Consultation in the site selection and approval process across district lines is recommended to ensure parkwide consistency.

campsite Development

In most instances campsite development will require field work to construct site access trails and smooth and gently sloped tentsites. Some type of special blazing or small camping symbol sign is necessary at junctions between park trails and campsite access trails. For sites located in the vicinity of shelters a site map will help to orient visitors to campsite locations. Trails to water sources, toilets, and food storage facilities should also be anticipated and constructed. At campsite locations a camping post or camping sign is needed (preferably numbered) to officially designate the site, distinguishing it from nearby illegal sites that may be present or created.

Given the group size limit of ten individuals campsites should have either two or three tentsites large enough to accommodate three to four person tents (10x10 feet minimum). The number of tentsites at each site will depend on site-specific geography but the goal should be at least a 50/50 split between two and three tentsite campsites. Smaller cooking areas can also be provided or some tentsites can elongated to create such space. Tentsites may be created in a number of arrangements. They can be developed singly with short connecting trails or placed together in a rectangular or circular configuration. Their surfaces should have a two to four percent slope and be free of depressions, stumps, roots, or protruding rocks. These can be produced by limited excavation (***note** cultural resource compliance requirement) and fill work or by importing fill in areas with vehicular access. Where needed, crib logs to retain soil on slopes can be used. Two logs that join at the downslope end of the tentsite are preferred over the use of three of four logs that will appear more artificial and unnatural. The goal of all work, particularly within wilderness, is that it be the minimum necessary to accomplish its purpose and substantially unnoticeable to campsite visitors. For example, the shape of tentsites should be

rounded rather than square and cut and fill work should have blended and irregular rather than sharp and straight boundaries.

Impacted Backcountry Campsite Rehabilitation

An applied aspect of the LAC planning framework is managing resource impacts when an established standard is being approached or exceeded. A variety of use-related, environmental, and managerial factors are subject to manipulation by park managers in efforts to prevent, minimize, and rehabilitate such impacts, The recovery of campsites which have exceeded specified standards can be hastened through a campsite rehabilitation program. However, rehabilitation efforts merely treat symptoms (the impacted areas) and must be accompanied by management actions which address the causes for the substandard conditions.

Resource indicators at SNP which address backcountry campsite impacts focus on the total impacted area of a site, amount of vegetation loss within a campsite, total amount of exposed soil within a campsite, number of sites exceeding a particular condition class, and density of campsites within an area.

If campsite impact standards along a particular trail are exceeded, backcountry managers have a variety of management strategies available for reducing site impacts, including: (1) educating users to low impact camping techniques, (2) enforcing camping regulations, (3) shifting use to more durable sites, including designated sites, (4) rehabilitating campsites, (5) closing campsites, (6) rationing use, and (7) closing selected areas to camping.

Campsite management strategies at SNP are based on opportunity classes and attempt to limit the size and amount of exposed soil on designated, existing legal, and dispersed campsites. Campsites which are "illegal" or exceed impact standards within an opportunity class should be targeted for rehabilitation or closure.

Campsite Rehabilitation Techniques

Research indicates that once a typical campsite is moderately impacted, it may take ten years or more without any use for complete recovery. In a National Park or wilderness area, backcountry managers may want to accelerate this process for a variety of reasons. A typical goal of backcountry campsite rehabilitation is to reduce site size or to discourage use of the site entirely. Basic techniques used in site rehabilitation include: (1) creating an uneven surface, (2) loosening soil and reintroducing organic material, (3) naturalizing site appearance, (4) eliminating campsite accessibility, and (5) site closure signing (if needed).

Creating an uneven surface: The goal of creating an uneven surface on an impacted site is to reduce its visual attraction and suitability for tenting to potential campers. One of the most reliable techniques used at SNP is to embed rocks into the soil on the site. Large rocks are moved onto the site, then set into a hole so that they are difficult to move. Another option is to use a grubbing tool to create mounds and shallow dips on the site. ***note** Cultural compliance is required for this activity.

Loosening soil and reintroducing organic material: Another goal of site rehabilitation is to relieve soil compaction and to accelerate the process of natural reseeding. This can be accomplished by loosening the soil surface with a fire rake or pulaski. This is followed by raking in organic material, such as leaf litter and duff material from an off-site location into the upper soil horizon. Introduction of leaf litter and other organic materials includes natural seeding which may accelerate the revegetation and renaturalization process.

Naturalize the appearance of site: Another method of rehabilitating a site is to blend the impacted site into the surrounding scene to reduce its potential for future use. This is typically done by dragging large pieces of dead and downed wood onto the site and spreading leaf litter across the site. Fallen wood catches and holds blowing leaves in autumn, further accelerating naturalization of the site. The use of dead wood on a site near a shelter or hut site is usually not time well spent, since the wood is used in fireplaces. Another option is active revegetation which may be appropriate on certain sites, but is more intensive management, often with marginal success rates.

Eliminating social path to site: The goal of eliminating informal trails to rehabilitated sites is to further reduce the opportunity that the site will be found and used again. This is often the most difficult step in rehabilitation to achieve. The typical method used is physically obstructing paths for some distance at the junction where they leave the main trail. Dead and downed wood is used for this purpose, but wood settles to the ground over time and often needs to be replaced from year to year. Another option is revegetation of the path with fast growing, hardy, and obstructive vegetation such as blackberry vines or greenbriar. The most effective method for eliminating a social trail is to eliminate or reduce the chance that the trail is recognized by a visitor. This can be accomplished in a variety of ways, but whichever technique is selected must be applied to the entire length of the social trail visible from the main trail or other campsites.

Site closure by signing: Signing can be used in conjunction with site rehabilitation, but should not be considered a method of site rehabilitation by itself. Closure signing might be used when rehabilitation techniques outlined above do not appear adequate to reduce use on a particular site, or when visitor use persists in spite of rehabilitation attempts. Wooden 4x4 posts with a routed message: "NO CAMPING" have been used since the late 1970's to close impacted, illegal campsites with fair success. These signs are subject to damage by vandals and bears. Literature suggests that signs with a brief explanation of why the site is closed may gain greater compliance, such as, "NO CAMPING - REVEGETATION AREA." As outlined in Chapter 6.8, the individual closure signs should not be viewed as permanent signs in the backcountry and their need should be reviewed annually at the district level in relation to the management objectives for that opportunity class.

Campsite Rehabilitation at SNP

In 1983 backcountry rangers at Shenandoah made the park's first inventory of impacted backcountry campsites. The campsite inventory revealed the existance of 1300 campsites, which rangers believed represented about 80% of the impacted campsites in the park at the time. In

conjunction with the campsite inventory, a 3 year campsite rehabilitation study was conducted, using 30 campsites per district for a total of 90 sites. The results of the study are found in Analysis of Visitor Impacts and Rehabilitation Methods for Backcountry Campsites at SNP (Marion and Haskell, 1988) and some of the findings are summarized as follows:

In general, the rehabilitation work was successful: one-third of the rehabilitated campsites disappeared; 45 % of campsites decreased more than 50% in size; 25 % of campsites remained the same size, while 3% increased in size. Note, however, that a decrease in campsite size does not imply ecological recovery, which may take more than 10 years.

Campsites at lower elevations had considerably lower rehabilitation success than those at higher elevations. These campsites are typically found along streams, and in dense hemlock stands where recovery of ground vegetation would be expected to progress slowly and visitor use levels are high. Rehabilitation success was highest for campsites in early successional vegetation types where the ground vegetation is typically dominated by grasses and sedges which are more resistant to trampling.

Rehabilitation success was higher for those campsites which were not visible from the nearest established trail and for those sites which were "illegal" and in plain view of the trail.

Several combinations of rehabilitation techniques were tried. The use of "No Camping" signs was most effective in reducing site size. The placement of natural barriers on campsites and along access trails appeared to be an effective method of discouraging use, but natural barriers had to be reestablished several times due to their removal by campers. The technique of loosening soil was not documented well enough to evaluate its effectiveness.

Other Impacted Campsite Management Techniques

A brief review of current literature on the subject of backcountry campsite rehabilitation suggests the following:

The temporary closure of campsites as part of a rest-rotation system is unlikely to succeed because of the extremely slow recovery time of impacted sites.

The use of fertilizer to accelerate revegetation is not recommended. Fertilizer seldom improves revegetation success and tends to favor exotic species, while increasing the risk of eutrophication of nearby waters.

Revegetation by transplanting can be successful, but is time consuming and can disturb adjacent areas from which plants are removed. Another option with a greater rate of Success is transporting to the backcountry the cuttings of native plants grown in a nursery for transplanting.

Another revegetation option is site seeding with the seeds of native plants adapted to the site. The process is complicated by the special needs of gathering, storing, and matching any special germination requirements of the seed.

Future Actions

A. Formalize designated backcountry campsite selection criteria and management guidelines. Select designated backcountry campsites in areas where it is deemed necessary.

B. Based on the most recent impacted backcountry campsite inventory, identify the priority areas where backcountry campsite rehabilitation is needed.

9.4 Sanitation and Public Health

Human Waste

Backcountry users are expected to practice good sanitary habits and comply with the provision of *36 CFR 7.15 d (2), Sanitation, which states: "Except in comfort facilities provided therefore, no person in the backcountry shall urinate or defecate within ten (10) yards of any stream, trail, unpaved road or park facility. Fecal material must be placed in a hole and covered with not less than three (3) inches of soil." Pit toilets at designated campsites may be needed in the future. (*NOTE: Sanitation regulations will be revised as SNP Special Regulations, 36 CFR 7.15, are removed to the Park Compendium upon approval of proposed backcountry use regulations.)

Food Storage

The opportunity to view wildlife in their natural state is a major attractant to national parks. Wildlife, however, are easily conditioned to not only accept, but to seek out visitors' foodstuffs as a supplement to their regular diet. Once this becomes a practice, animals become habituated to humans and dependent upon unnatural and often harmful food supplies. To prevent this from happening, strict food storage regulations are in effect. Backcountry users must comply with the provision of 36 CFR 2.10 (d), Camping and food storage, which states in part: "The superintendent may designate all or a portion of a park area where food must be....suspended at least 10 feet above the ground and 4 feet horizontally from a post, tree trunk, or other object." This not only discourages bears but many other species of wildlife that are attracted to human foods as well.

Toilets

Primitive toilet facilities are found adjacent to PATC-operated huts and cabins and are reserved for those people using the huts or renting the cabins. As discussed in chapter 9.3, pit toilets will be installed at high-use designated campsites.

Trash and Garbage

Backcountry users are required to pack out all refuse and garbage. 36 CFR 2.14 (a) (1) states, "Disposing of refuse in other than refuse receptacles is prohibited." Garbage cans will only be provided at trailheads where it is deemed necessary.

Water Ouality and Public Health

A chlorinated water system is provided at Byrds Nest 3, and is maintained on a regular basis. This is a closed system with pipelines, valves, and faucets, and is sampled for water quality on a regular basis.

Untreated water sources are found throughout the backcountry. There are numerous open springs that are not treated or sampled on a regular basis. Any of these sources that are signed have a one minute boil warning on the sign. Only water sources found in the Threshold opportunity class, in the AT opportunity class along the AT footpath, or adjacent to PATC cabins will be signed. Water sources should only be signed if water is coming out a pipe (unclosed system) or is the main water supply around a cabin, hut, or shelter.

Under current regulations (1997), backcountry campsites must be located at least 25 feet from any stream (36 CFR 7.15 (b) (3) (v)). Furthermore, campers are required to exercise care and caution to prevent contamination of any water source due to sewage, wastewater disposal, horse and pack animal use, dishwashing, bathing, etc. according to 36 CFR 2.14 (a) (6) Sanitation and refuse. Several water-borne diseases including Giardiasis and Camplylobacter are presumably present in untreated park water sources. Backcountry users should be encouraged to treat all unprotected surface water by boiling it vigorously for one minute or by filtering it with a device which filters these micro-organisms. If these precautions are ignored, the chances for gastro-intestinal distress of varying severity is greatly increased.

Future Actions

A. As designated campsites are established, pit toilets must be installed at high-use sites and all designated site areas must be monitored for excessive human waste buildup.

B. Monitor fecal counts in water sources located near heavily used backcountry campsites or day use areas.

C. Evaluate the need for the water system at Byrds Nest #3 shelter; eliminate the system if appropriate.

CHAPTER 10
RESEARCH AND MONITORING

10.1 Backcountry Campsite Impact Inventory and Monitoring

The monitoring program incorporated in this plan addresses visitor use, one of many challenges to preserving natural environments. Though a central purpose for the creation and management of parks, visitation inevitably affects the natural and cultural resources of parks. This is particularly true at overnight campsites and day-use recreation sites, where visitation and its effects are concentrated. Potential consequences of visitation include the trampling and subsequent loss of ground vegetation, shrubs, tree seedlings, and felling of saplings; erosion of surface litter and humus; exposure, erosion, and compaction of mineral soil; and exposure of tree roots and damage to tree trunks (see Table 10.1) (Cole 1982, Marion 1984, Cole and Marion 1988). Disturbance of cultural resources by visitors has also been documented at SNP.

The NPS recognizes the need for effective visitor management and resource protection programs to balance visitation with its associated resource impacts. The recurring question, "are we loving our parks to death?" increasingly challenges managers to develop and implement management policies, strategies, and actions that permit the recreational use of 'parks without compromising their ecological and aesthetic integrity. Furthermore, managers are frequently forced to engage in this balancing act under the close scrutiny of the public, competing interest groups, and the courts.

As with other prominent and critical resource issues, managers can no longer afford a wait-and-see attitude or rely on subjective impressions of deterioration in resource conditions. Managers require scientifically valid research and monitoring data. Such data should describe the nature and severity of resource impacts and the relationships of controlling visitor use and biophysical factors. Research has revealed that these relationships are complex and not always intuitively obvious. A reliable information base is therefore essential to managers seeking to develop and implement effective visitor and resource management programs.

Table 10.1. Resource impacts caused by camping activities.

Vegetation Changes	Soil Changes	Additional Concerns
• Loss of Vegetation Cover • Alteration of Composition • Loss of Species • Damage to Trees • Exposure of Tree Roots • Loss of Tree Regeneration	• Loss of Organic Matter • Erosion • Compaction • Reduction in Soil Moisture	• Littering • Threats to Water Quality • Threats to Human Health • Threats to Wildlife • Threats to Cultural Resources

This plan calls for the application of the NPS visitor impact monitoring procedural manual (Marion 1991) to the development and implementation of a backcountry campsite inventory and impact monitoring program for SNP. The inventory and monitoring procedures outlined in the

manual were implemented at SNP in 1992, with the inventory completed in mid-1993. Legislative, administrative, and park resource protection mandates and objectives provide justification for this program and are documented elsewhere in this plan.

Although there are numerous reasons for developing a backcountry impact inventory and monitoring program, the actual value of these programs is entirely dependent upon the park managers who initiate and manage them. Programs developed with little regard to data quality assurance or operated in isolation from resource protection decision making will be short-lived. In contrast, programs that provide managers with reliable information that is necessary to develop and evaluate resource protection policies, strategies, and actions can be of significant value. Only through the implementation of objective management frameworks which integrate defensible monitoring programs can we hope to provide legitimate answers to the question, "are we loving our parks to death?"

Management Policies and Guidelines

Authority for implementing congressional laws is delegated to agencies, which identify and interpret all relevant laws and formulate management policies to guide their implementation For the NPS, these policies are set forth in the Management Policies.

Several statements in the Management Policies specifically require resource inventory and visitor impact monitoring:

> The National Park Service will assemble baseline inventory data describing the natural resources under its stewardship and will monitor those resources at regular intervals to detect or predict changes. The resulting information will be analyzed to detect changes that may require intervention and to provide reference points for comparison with other, more [human-]altered environments. (Chapter 4:4)

> Backcountry use will be managed to avoid unacceptable impacts on park resources or adverse effects on visitor enjoyment of appropriate recreational experiences. The National Park Service will identify acceptable limits of impacts, monitor backcountry use levels and resource conditions, and take prompt corrective action when unacceptable impacts occur. (Chapter 8:3)

> In every park containing wilderness, the conditions and long-term trends of wilderness resources will be monitored to identify needs for, and results of, management actions . . . every wilderness monitoring program will not only assess physical and biological resources, but also identify what impacts people have on resources and values and what impacts they have on other people using the wilderness. (Chapter 6:5)

> Potential impacts on soil resources will be routinely monitored. (Chapter 4:20)

Resource inventory and monitoring are also recommended for parks that have restricted visitor use:

> Any restrictions on recreational use will be limited to the minimum necessary to protect park resources and values and to promote visitor safety and enjoyment. To the extent practicable, public use limits established by the National Park Service will be based on the results of scientific research and other available support data. (Chapter 8:2)

Two NPS natural resource management guidelines, NPS-75, the Guidelines for Natural Resources Inventorying and Monitoring (USDI 1992), and NPS-77, Natural Resources Management Guideline (USDI 1991), also have relevance to visitor impact monitoring. NPS-75 states:

> It is the policy of the National Park Service to assemble baseline inventory data describing the natural resources under its stewardship, and to monitor those resources forever; to detect or predict changes that may require intervention . . . and with growing awareness of the effects of human activities within the parks, natural resource baseline inventories and subsequent monitoring are an essential basis for park management. (Chapter 1: 1)

NPS-77 also addresses resource inventory and monitoring programs:

> To fulfill the NPS mission of conserving parks, it is essential that park managers know the nature and condition of the resources in their stewardship, have the means to detect and document changes in those resources, and understand the forces driving the changes. (Chapter 5:20)

Superintendents are responsible for developing and implementing backcountry recreational use programs in parks (noted in chapter 3). Restrictions on visitor use are to be the minimum necessary:

> Any restrictions on use should directly relate to the accomplishment of specific management objectives identified in the plan, or resolve specific, documented impacts. (Chapter 3:73)

This plan has adopted a planning/management framework combining aspects of the LAC (Stankey et al., 1985) and VIM (Graefe, Kuss, and Vaske, 1990) approaches (see chapter 4). A backcountry campsite monitoring program is an essential element for these planning and management frameworks. As noted earlier, the NPS Management Policies requires using approaches that identify and monitor acceptable limits of change in backcountry settings.

Under the LAC and VIM frameworks, numerical standards can be set for individual impact parameters to specify the limits of acceptable change. These limits define the critical boundary line between acceptable and unacceptable conditions, establishing a measurable reference point to which future conditions can be compared. A visitor impact monitoring program provides the information that is needed by managers to formulate realistic standards and to periodically assess and evaluate resource conditions in relation to these standards.

Visitor Perceptions of Impacts

Visitor perceptions of recreational impacts are yet another justification for management concern regarding the acceptability of resource impacts. Results from visitor impact perception research indicate that visitors to wildland environments are indeed aware of recreational impacts (Lucas 1979, Marion and Lime 1986). In general, visitors are more sensitive to direct impacts of other visitors (such as the occurrence of litter, horse manure, malicious damage to vegetation) and particularly obtrusive examples of tree root exposure and soil erosion. A recent survey of visitors to three eastern wilderness areas found that littering and human damage to campsite trees were among the most highly rated indicators affecting the quality of wilderness experiences (Roggenbuck 1992). These and other resource impact indicators, such as the amount of vegetation loss and bare ground around a campsite, were rated above many social indicators, including the number of people seen while hiking and encounters with other groups at campsites. Additional studies of this type can supply valuable input to managers in the selection of appropriate impact monitoring indicators.

History of Campsite Monitoring at SNP

A trail inventory conducted within the Front Royal Sub-District in 1979 is the first recorded effort to monitor visitor impacts in Shenandoah National Park. The inventory included tallies of campsites and used areas, and items such as fire rings, litter, and tree cutting.

All backcountry campsites were evaluated from 1981-83 as part of a baseline campsite inventory and rehabilitation effort (Marion and Haskell, 1988). This survey included two impact parameters, site size and degree of erosion, and several inventory parameters such as site distance from water and the trail, vegetation type, elevation, slope, and developments. The survey was designed to inventory sites and to test practical methods for rehabilitating sites, not as a long-term monitoring system.

In 1989, South District staff inventoried 50 impacted campsites in the Riprap area using protocol developed by Cole for the U. S. Forest Service. The sites were rated and the most impacted sites were rehabilitated.

Research work by Marion in 1990-91 in the South District of SNP evaluated the accuracy and precision of alternative campsite monitoring procedures through field trials with park backcountry staff. This work provided the basis for some of the recommendations in the servicewide visitor impact monitoring manual (Marion 1991).

In 1992, a parkwide backcountry campsite monitoring program (chapter 9) was initiated and sponsored by the Mid-Atlantic Region Science Program. The inventory was completed in mid-summer 1993. Data from the inventory was available for analysis and has been used to develop standards and shape new strategies for backcountry management at SNP in this plan.

Monitoring Program Development, Objectives and Capabilities

Monitoring Program Development (1992)

Development of the campsite monitoring program initiated in 1992 was sponsored by the Mid-Atlantic Region Science Program under Cooperative Agreement 4000-9-8014, Supplemental Agreement Number 24. The development of the monitoring program was part of a larger research study designed to evaluate alternative backcountry camping impact management strategies. It is hoped that in the future, campsite monitoring data from Shenandoah and Great Smoky Mountains National Parks will be compared to evaluate three strategies: **dispersed camping** and **area closures** to camping as practiced at SNP, and **designated site camping** as practiced at Great Smoky Mountains National Park.

Monitoring Program Objectives

The overall objective of the backcountry campsite impact monitoring program is to provide park decision makers with reliable yet cost-effective data on the condition of campsites over time. Specifically, the monitoring program seeks to:

1. Obtain quantifiable measurements for managerially relevant campsite impact parameters using scientifically valid procedures.

2. Provide current and reliable information for resource protection decision making, including data analysis capabilities providing input to visitor impact management frameworks based on indicators and standards.

3. Maintain flexibility in the design and application of 'monitoring procedures to accommodate changing management needs and constraints.

4. Emphasize data accuracy and precision through the development and documentation of standardized monitoring procedures, quality assurance protocols, and field staff training programs.

Monitoring Program Capabilities

Effective management of visitor impacts requires objective and current information from inventory, monitoring, and research efforts. Management informational needs include documentation of where impacts are occurring, the types and severity of impacts, how impacts relate to amount and type of visitor use, how impacts relate to influential biophysical factors, and the effectiveness of management strategies and actions implemented to minimize resource impacts.

Scientists and managers have developed numerous impact monitoring systems to document and evaluate resource impacts resulting from visitor use. These management-oriented monitoring programs provide a standard approach for collecting and analyzing site-specific information on the nature and severity of visitor impacts over time (Table 10.2).

Table 10.2. Capabilities of visitor impact monitoring systems.

Monitoring Capabilities
• Identify and quantify site-specific resource impacts.
• Summarize impacts by environmental or use-related factors to detect and evaluate relationships.
• Aid in setting and monitoring management standards for resource conditions.
• Evaluate deterioration in resource conditions to suggest potential causes and effective management actions.
• Evaluate the effectiveness of resource protection measures.
• Identify and assign priorities to maintenance needs.

When implemented properly and with periodic reassessments, these programs can produce a data base that has significant benefits for the park manager, A monitoring program provides an objective record of changes occurring in visitor areas, even though individual managers may come and go. A monitoring program can help in detecting and evaluating trends by comparing data from present and past impact assessments. Deteriorating conditions can be detected before severe or irreversible impacts occur, allowing time to implement corrective actions. Relationships between specific impacts and use-related or biophysical information may suggest appropriate management actions. A monitoring program also helps in evaluating the success or failure of resource protection measures.

This plan seeks to formalize the implementation of a backcountry campsite impact monitoring program for SNP. It is recognized that long term monitoring of backcountry conditions is integral to the plan's success. The selection of physical or social indicators and the formulation of standards can not be justified or defended if existing and changing backcountry conditions are not documented and monitored. It is also recognized that there are many forces in public agencies which act against the continuance of long-term resource monitoring programs, such as changes in park personnel and priorities. It is recommended that this monitoring program be incorporated into the park's base operation in a manner similar to the Long Term Ecological Monitoring System (LTEMS) to help to ensure long-term support.

A comprehensive campsite impact monitoring manual, specific to SNP, has been developed as part of the campsite monitoring (Marion, 1993). This manual provides comprehensive documentation for the operation of the campsite monitoring program, including information on the following topics: personnel responsibilities and needs, budget estimates, recommendations for monitoring frequency, and descriptions of field forms, assessment procedures, database management, data analysis, and report production.

The value and longevity of the campsite impact monitoring program will be dependent largely upon its integration with and responsiveness to park management and decision making. A failure to cultivate and maintain organizational support will ultimately lead to its termination or result in a program that is operated in isolation by a particular district or unit. Achieving and maintaining a broad base of support for the monitoring effort should be a primary objective'for those involved with managing the monitoring program.

Future Actions

A. Implement a long term backcountry campsite monitoring program at SNP. This would include identifying personnel responsible and budget needs for field implementation and data management.

B. Identify and establish backcountry management personnel responsible for overseeing monitoring programs, analyzing data for comparison with established indicators and standards, and recommending management actions when standards are approached or exceeded.

C. Options are designated campsites or area closure to camping where significant cultural resources are being impacted.

10.2 Backcountry Trail Impact Inventory and Monitoring

During the 1970s the only trail conditions which were formally monitored were the blue blazed trails maintained by **PATC** trail overseers. These trails were inspected annually by SNP rangers using PATC's inspection form. The AT and other high visitor use trails throughout the park were maintained by regular NPS trail crews who informally monitored the trails and planned the year's work in the spring during the first walk through. A group of narrow grade, low use, yellow blazed foot trails referred to as "fire foot trails" were informally monitored and maintained on a as-time-permitted basis by the backcountry rangers.

In 1979 and 1980 two events occurred which prompted a major reorganization of trails maintenance responsibilities at SNP. There was an initiative along the entire AT to return all routine trail maintenance of the AT to local trail clubs. This occurred at a time when SNP's trail crew budget was severely cut. SNP and PATC responded to these changes and worked out an agreement which generally guides trail designations and trail maintenance responsibilities today. PATC is responsible for general trail maintenance on the AT and the majority of other foot trails (blue-blazed trails) and SNP trail crews are responsible for maintenance on horse/foot trails (yellow-blazed trails) and are available to assist PATC with technical or special trail maintenance needs.

Since 1980 the backcountry rangers have been responsible for monitoring backcountry trail conditions throughout the park. This had typically been done by documenting trail conditions on a "Trail Inspection/Condition Report" (Form SNP-259) annually, or more often if needed and forwarding the report to the trail overseer. These reports or a version of them are still in use today. These monitoring reports are non-technical in nature and are intended to give trail

managers and maintainers a brief overview of trail conditions to identify problems and aid in planning future work trips. The trail inspection report documents several items:

- Blazing (condition, appropriate number?),
- Signs (repairs needed, recommended changes),
- Obstacles (fallen trees, etc. causing hikers to be diverted),
- Vegetation (trimming needed),
- Erosion/water control (tread loss, perennial wetness),
- Tread problems (other than water),
- Other concerns (short cutting, litter, vandalism, etc.),
- Level of maintenance needed to correct problems noted,
- Trail access problems.

From 1983 to the early 1990s backcountry rangers summarized trail condition information and into an annual "State of the Trails" report which was presented at annual meetings of PATC and SNP trail managers. The State of the Trails report included details to serve as a guide from which annual trail work plans were developed at the district level. Trail condition monitoring at SNP has historically been non-technical and rather subjective from year to year depending on the trail maintenance experience of the trail inspectors. Trail condition monitoring at SNP focuses on identifying and prioritizing trail maintenance needs of the park with the highest priority always being those trails with obvious occurring resource damage or public safety concerns.

The most detailed monitoring project of SNP trails took place in 1986, when an interdivisional Maintenance and Resource Protection and Visitor Management (RP&VM) division survey was made of all the trails in the park. In this survey teams used a measuring wheel, a clinometer 'and a surveyor's notebook to record the location of all existing trail features (waterbars, etc.) and needed trail work to the nearest foot, as well as percent slope of tread and percent side slope. This information was used in 1987 to administer a more than $600,000 trails rehabilitation contract to restore trails damaged by flooding in November 1985.

In 1998, Park management assigned monitoring, management of the SNP trail system, and supervision of the NPS trail crews to the Division of Natural and Cultural Resources (NCR) to more efficiently coordinate management and maintenance of the SNP trail system. These responsibilities are now those of the parkwide Trails Coordinator, District Trail Crew Supervisors, and the Backcountry and Wilderness Manager.

Storm Damage Assessment to Trails

In addition to routine monitoring of trail conditions, the Division of NCR coordinates special trail condition monitoring projects documenting the effects of natural disasters such as floods, hurricanes, and ice storms on the trails. This documentation is then used to coordinate non-routine trail maintenance projects, or to apply for special disaster relief funding.

Although backcountry trail condition monitoring at SNP is mainly focused on identifying and

prioritizing district and parkwide trail maintenance needs by the most efficient means, the system readily identifies occurring resource damage and public safety concerns. The monitoring data gathered for the routine annual reports is subjective in nature and not quantitative. Quantitative monitoring data is sometimes gathered on SNP trails when needed to document major resource damage related to a natural disaster. Such data is much more expensive to gather and requires additional staffing than is normally programmed the park's backcountry management operation.

Future Actions

A. Develop a more consistent and quantitative method for monitoring and inspecting trail conditions at SNP.

10.3 Natural Resource Inventory and Monitoring

SNP began the development of natural resource monitoring programs in the early 1980s with special emphases on air quality, water quality, fish and black bears. In 1991 the park was selected as a prototype inventory and monitoring program for the NPS which allowed the park to hire monitoring specialists and expand programs for other resources of concern. An overview of the monitoring program development is found in the Natural Resource Inventorv and Long-Term Monitoring; System Plan for Shenandoah National Park (1991). The records, data and analyses of the inventories and monitoring projects is maintained by the staff of the Division of Natural and Cultural Resources.

The goal of this program is to identify and measure changes in the components of the natural systems that represent SNP. In most cases, the program will be establishing baseline data for resources for the first time since the park was established. This information will be made available for management decision making, resource protection, education of park staff and the public, and scientists interested in specific resource questions. Direct human impacts on resources will be identifiable in some resource datasets. Resource conditions and changes in the resources can be compared to the results of backcountry use monitoring and appropriate responses for protection of resources or environmental processes can be developed. In some cases recommendations for restoration with subsequent monitoring will result. This monitoring system will be ongoing and will continue to adapt to changes in the resources and the needs of SNP managers.

10.4 Social Inventory and Monitoring

The NPS is endeavoring to enhance the social science component of park and servicewide resource management programs. This goal is yet to be reached. In the interim this Park shall approach social science issues on an as needed basis. In 1992 a park ad hoc committee on social science issues has identified several topics that relate to backcountry use:

1. Visitor perception of backcountry and its use,
2. A long-term monitoring of backcountry user and their impacts,

3. Park neighbors' perceptions of park values, and
4. Backcountry accessibility for an aging population.

As the social science component of the resource management program develops, its application to the needs of backcountry management will be recognized and applied.

Future Actions

A. Conduct a social science survey of backcountry visitors to: 1) identify appropriate social indicators and their current range of conditions within the recreational opportunity classes defined by this plan, 2) describe their perceptions of existing trail and campsite conditions, 3) describe their perceptions of existing and planned camping regulations, and 4) develop an efficient monitoring program for social science indicators. An Old Rag social science survey may be conducted separately and prior to the parkwide survey due to critical management issues at that location,

B. Develop standards for social science indicators and implement a routine monitoring program.

10.5 Data Collection and Management

The data collected in the various items monitored in the course of this plan shall be reduced to a digital format and archived in the Division of Natural and Cultural Resources (NCR).

Future Actions

A. Develop a system for collecting and archiving collected backcountry monitoring data with the NCR.

CHAPTER 11
INTERPRETATION AND EDUCATION

11.1 "Minimum-Impact" Backcountry Use Education

Providing effective education and information to backcountry and wilderness users is an essential lighthanded management strategy that permits freedom, exploration, and spontaneity to the backcountry user. Informing backcountry users is typically viewed as unobtrusive and non-authoritarian. With effective education and information the backcountry visitor retains freedom of choice; they can choose to respond or not to respond. With this approach the manager becomes a helpful guide rather than one who restricts or regulates. Research has consistently shown that a majority of backcountry users want information.

Most experts believe that the majority of unacceptable visitor impacts in backcountry or wilderness settings are nonmalicious acts. These unintentional acts are carried out by the uninformed, unskilled, and careless backcountry user. Persuasive and well directed information can be highly effective in reducing environmental impacts, visitor conflicts, and problem behaviors.

The key to providing effective education and information to backcountry users is to (1) identify the target audiences to be reached, (2) present information to the target audiences at places where they will receive it, (3) provide information in a timely manner (before the user enters the backcountry), (4) provide messages which are relevant, credible, sequential, and concise, and (5) select the most effective media to channel the information within the given circumstances or constraints. Continued evaluation and adjustment of each element of this process must be on-going for this educational approach to be effective.

Identifying our backcountry user audiences is essential. Taking the shotgun approach is inefficient and ineffective. We must identify those groups which use and impact the backcountry resource most, like boy scout and youth groups, first-time backcountry users, and day-hikers. We need to provide these target audiences with target messages as far in advance of their entering the backcountry as possible, so that they can make informed decisions about their trip plans and be knowledgeable enough to behave in a minimum-impact manner.

Just issuing permits to trip leaders and reviewing the rules and regulations is not enough. With thoughtful strategies involving minimum-impact information we can help people attain the experiences they seek, ayoid disappointments from expectations not met, and separate user groups seeking to participate in conflicting and incompatible activities. Information and education can be used to direct potential wilderness users seeking experiences not dependent on wilderness to more appropriate areas within the backcountry. Informing visitors of heavily and lightly used zones and times within the backcountry can better redistribute use throughout the area or through time, and provide increased opportunities of solitude. Educating actual or potential backcountry users on minimum-impact hiking and camping can increase knowledge and skill levels, change behavior, and reduce site impact.

The NPS and other federal land management agencies have adopted the "Leave No Trace" (LNT) outdoor skills and ethics education program developed by the National Outdoor Leadership School (NOLS) in Lander, Wyoming. This is a national educational program whose mission is to educate wildland user groups, federal agencies, and the public about minimum-impact camping and hiking. The program is not meant to provide a set of rules and regulations, but is intended as principles and practices which help the backcountry/wilderness user to make better decisions "based on an abiding respect for and appreciation of wild places and their inhabitants. " NOLS provides the LNT Skills and Ethics Series of educational booklets which are directed to LNT practices for specific geographical regions of the country. The LNT Southeastern States booklet is that which provides recommended LNT practices for the region including SNP. Also, the NOLS publication, Soft Paths, offered for sale at SNP visitor centers by the Shenandoah Natural History Association (SNHA), is an excellent guide to responsible ethics and behavior in outdoor recreation.

Research indicates that the most effective media of communicating information to backcountry users is oral or face-to-face communication. Written brochures can be effective, particularly in combination with personal contact. Short educational slide presentations or videos have proven to be effective, as well as some "user-friendly" microcomputer aids. Communication through television, radio, and newspapers has been shown to be ineffective for reaching the backcountry user.

Based on this information the following strategies have been developed to reduce backcountry user impacts on SNP's backcountry.

Education and Information Strategies

A. Personal Contact Strategies

1. Provide LNT training. in park backcountry recreation management to park and concessioner employees so that effective "face-to-face" communication with visitors to educate them on minimum-impact techniques is assured. This training is of particular importance for those employees responsible for issuance of backcountry camping permits. The park needs to continue to provide opportunities for some employees to achieve training as "LNT Masters" to further train other employees and targeted user groups. In cooperations with NOLS, the park may also provide in-park LNT Master training courses to include trainees from park cooperators, user groups, other NPS areas, and other land management agencies.

2. Develop a workshop on LNT camping that can be presented to target audiences prior to their backcountry visit. Audiences could include any appropriate groups such as scouts and other youth groups and their leaders. Workshops can be conducted on and off site during the shoulder seasons.

B. Written Information Strategies

1. Rewrite the current backcountry brochure. Emphasis will be placed on wilderness ethics and SNP backcountry management, as well as the latest minimum-impact camping techniques. Distribution will be widespread at visitor centers, entrance stations, ranger stations, and through park mailings and all the listed personal contact strategies.

2. Site bulletins and maps will be developed. Distribution of this material will be somewhat limited. It will be available at the trailheads either through personal contact or dispenser. The appropriate site bulletin will be provided to backcountry campers inquiring or obtaining a backcountry camping permit for a designated campsite area.

C. Multimedia Strategies

1. Develop a 10 to 12 minute video on minimum-impact camping in SNP. The target audience will be unskilled, first-time SNP backcountry campers and perhaps any first-time visitors to the backcountry. It will be part of the backcountry overnight camping permit program to help educate first-time users upon permit issuance. The video might be available for sale by SNHA, the park concessioner, and area outfitters. The video will also be available for loan to organized groups like Boy Scouts and church groups. The video will be shown at backcountry workshops and training courses. It may be shown by outfitters in their stores, at off-site programs, and at the visitor centers as desired. Such organizations as PATC and NOLS might contribute to accomplishment of this task.

Future Actions

A. Personal Contact Strategies:

1. Establish a backcountry user information hotline. This phone line would be available to potential backcountry users during park business hours. It would be answered, during the height of the backcountry season, by a limited number of rangers who are well informed on backcountry concerns in order to provide consistent and accurate information. A recorded information message would be provided to callers after hours and allow callers to leave a message for a return call or mail information request.

2. Increase backcountry user contacts with rangers at busy trailheads and on trails. Though law enforcement backcountry patrols are important in detecting and monitoring visitor impacts, they may have limited effect in influencing visitor behavior as damage may be done by the time a ranger contact is made. Contacting visitors at the trailhead or on the trail, at optimum times of the day, can prevent resource and social impacts by reaching and educating the uninformed and unskilled backcountry user before they have had a chance to damage the resource and degrade the experience of other visitors.

3. An optional backcountry certification workshop or course will be conducted regularly or as a scheduled interpretive activity. Participants will be certified as a park LNT camper and upon course completion issued a card which certifies the user's knowledge of park backcountry management principles. The only requirement for future backcountry use will be for the permit holder to file a trip itinerary and possess their

permit card each time they use the backcountry.

4. Interpretive programs will be conducted in each district throughout the core visitor season. Programs would include minimum-impact camping and what to do if lost in the woods. Target audiences will be day users and unskilled first-time backcountry users.

B. Written Information Strategies:

1. A backcountry newsletter will be printed annually and sent to all persons who were issued a backcountry permit for the previous year. The target audience is, of course, repeat users of the park's backcountry. Emphasis of the newsletter will be on backcountry management concerns, updates on policies and regulations, and suggested alternative hikes to lessen impacts on heavily used areas.

C. Multimedia Strategies:

1. Develop a "user-friendly" computer program using touch screen exhibits and information systems to dispense information about the backcountry in a sequential decision-making format. Touch screen exhibits will be placed at each visitor center and programmed in a decision-tree format. The format will allow the user to use their own decision-making criteria in their own preferred sequence. The program can be used by all target audiences, because they could select the information that would be most useful or beneficial to them. The exhibit can be programmed to offer instruction in LNT camping techniques or help someone choose a trail that meets their personal desires and experience level.

2. Create a video program which can be used at backcountry camping permit issuing stations to educate backcountry users on LNT camping techniques. This program can also be provided to outside organizations and local outfitters.

EVALUATION OF EDUCATION AND INFORMATION STRATEGIES

1. In cooperation with Virginia Tech and other interested institutions, conduct social science surveys on each strategy implemented to evaluate its relative effectiveness. Make adjustment and improvements to the strategies as needed.

2. Interpretation efforts will use focus groups as an evaluation tool to assess the effectiveness of such strategies as the minimum-impact camping video, interpretive presentations, workshops on minimum-impact camping, and the computer touch screen exhibit. Evaluating by focus groups is a structured group discussion by park visitors on specific interpretive programs or information services. Focus groups reveal visitor's attitudes toward and perceptions of the interpretive program or information service. The results of the evaluation will be a written summary of visitor's verbal responses to questions about these services. Interpreters will follow the guidelines as set forth in the training package prepared for the NPS entitled, "Focus Groups: A Tool for Evaluating Interpretive Services."

CHAPTER 12
BACKCOUNTRY CAMPING PERMIT SYSTEM

12.1 System and Administration

SNP backcountry is used primarily by day hikers for a variety of activities. Backcountry day use has substantial direct impact on trails and at attraction sites, but overnight camping activities have much greater potential for resource and social impacts off-trail. Overnight campers differ from day users in their expectations of the backcountry experience which involves additional skill, challenge, and risk in the outdoor environment. Backcountry camping activities need to be managed to reduce impacts and additional service and information needs to be provided to visitors. A mandatory backcountry camping permit system is a management action selected as an important program in meeting the objectives of the BWMP. The system is designed to meet the following objectives:

1. Educate and inform overnight visitors on camping regulations and practices to minimize their impacts on the backcountry resource .

2. Direct overnight visitors to backcountry areas where they can best meet their interests as well as where they cause the least impact.

3. Provide customer service by informing overnight visitors of backcountry conditions, anticipated weather conditions, and safety information.

4. Provide customer service by acknowledging the visitor's presence in the backcountry so that any needed emergency response by park staff is enhanced.

5. Provide assurance that the backcountry camper understands and acknowledges regulations and expected behavior in the backcountry, therefore enhancing the park staff's ability to enforce regulations designed to protect both the resource and the visitor's backcountry experience.

6. Provide a method of documenting overnight visitor use and campsite location statistics for analytical use. This documentation can be applied to decisions on management actions to reduce backcountry impacts.

To best meet these objectives, staffed backcountry camping permit issuance requiring face-to-face contact is the preferred strategy over self-registration permit issuance. The backcountry camping permit system should meet these objectives while providing for visitor convenience in obtaining the mandatory permit.

Backcountrv Camping Permit Issuing Stations

Historically, Park entrance fee collection stations have been responsible for a major share of issuing backcountry camping permits. However, visitor activity in and around these stations has

impacts on accountability and security in fee collection operations. Vehicle and visitor congestion at stations during peak visitor use periods further impacts fee operations, visitor and employee safety, visitor service, and the success of the permit system in resource protection. Experience in managing the SNP backcountry camping permit system indicates that issuing permits is most appropriately done at visitor centers or information stations designed and that are staffed for extensive visitor contact.

Any form of backcountry camping permit issuance at fee collection stations should be minimized, especially during peak visitation periods. It is anticipated that staffed permit issuing stations will be limited primarily to Dickey Ridge Visitor Center and Thornton Gap Inforation Station in the North District, Byrd Visitor Center in the Central District, and Loft Mountain Information Station in the South District. To expand the system of permit issuing stations (particularly outside of the park) might be counter-productive since some centralization is necessary for effectiveness in meeting some permit objectives and in anticipation of user fees and development of a computerized permit network and mandatory fee permit system. Strategies for issuing permits including support from cooperative volunteer organizations such as PATC, Sierra Club, Nordic Ski Patrol (north district), and others should be explored. A seasonally staffed information station has been established at the base (park boundary) of Old Rag Mountain in the Central District to provide visitor service and backcountry resource protection (see chapter 13).

Visitors may also currently obtain permits by mail or by telephone contact with any permit-issuing station or Park headquarters, but this is not encouraged due to some difficulty in this strategy to meet some permit objectives. In the future, mailing of permits might be performed by a centralized permit office to remove this workload and responsibility from the Park headquarters area. A centralized backcountry office would facilitate a computerized permit network and a backcountry campsite reservation/fee system as the need arises.

Self-registration backcountry camping permit stations can be the preferred alternative at some locations and times. Backcountry camping impacts during the winter months are substantially reduced from the rest of the year due to reduced park visitation in general, the tendency of winter backpackers to be more highly skilled in minimizing their impacts, and the seasonally dormant forest environment. Therefore, parkwide permit self-registration is appropriate outside of the backcountry use “core” season, from about mid-November through mid-March when park staffing is also at its minimum. All Park backcountry regulations continue to be enforced through this period. During this period the permit system will provide only rough visitation estimates for Park management and basic trails and regulation information to visitors. Permanent self-registration stations will also be provided at AT locations with the intent of providing service, information, and permit convenience to long-distance trail hikers entering the park. Otherwise, “after hours” permitting and any other backcountry camping permit self-registration must be severely limited. Park interpretive, publications and station signing must clearly state the backcountry camping permit requirement and the scheduled station hours during which permits can be obtained.

Backcountry camping permit self-registration should be closely monitored and minimized as

changes in backcountry conditions approach the standards set in the management objectives. Emphasis must be placed on management of backcountry conditions, not on management of a camping permit system.

Backcountry Site Bulletins/Maps

The visitor's backcountry opportunities and protection of the resource from human impact will be managed by the backcountry camping permit system based on five "opportunity classes" described for the park. The opportunity classes reflect a spectrum of visitor opportunities from "low use" to "high use" areas and management actions from "light-handed to "heavy-handed." For example, management actions can range from a dispersed camping strategy and infrequent ranger patrols to designated campsite reservations or strict area closures and routine ranger patrols. The opportunity classes have been mapped as zones in the BMP. Within the mapped zones, specific campsite management strategies, backcountry trail and campsite standards, and visitor opportunity for solitude are described for each opportunity class. This is a complex management and planning system in response to complex backcountry issues, but is made logical and simplified for visitors by use of backcountry site maps.

Backcountry site bulletin/map handouts will be the key to providing the visitor with trip planning and campsite information during issuance of a backcountry camping permit. The park backcountry has been sectioned into "sites" with identifying geographical names. Each site will have an 8.5" x 11" map which describes the opportunity class or classes within that site in terms of applicable camping regulations. The site map will include basic trail map information (not to the detail of district PATC trail maps) and specific campsite regulation information for each zone located within the site. The site map might include area closure information, appropriate safety messages, and other site-specific information. Each administrative district in the park will have several site maps for appropriate issuance with the backpacking permit. For example, a visitor traveling the Jeremys Run-Neighbor Mountain trail circuit in the North District and camping in Jeremys Run would be given a "Jeremys Run" site map. From map information, the visitor would be required to camp in any existing "established" campsite within the Jeremys Run trail area. Dispersal camping in the Neighbor Mountain zone, a low use area, would be permitted as described by that site map (see chapter 9 for details on campsite management). The site map strategy ensures that the visitor is properly informed even when the permit issuer is totally unfamiliar with the area the permit is being written for (a situation that will be minimized as possible). The backcountry camping permit would be written using "zone codes" instead of "trail codes." A generic site bulletin would be produced for the Primitive Wilderness and Primitive Non-wilderness opportunity classes throughout the Park and could relate to a variety of sites, reducing the number of site bulletins or maps needed parkwide.

Other Backcountry Camping Permit Issuance Strategies

To facilitate issuance of permits at established stations and the training of new permit writers, a videotaped or computer-aided program of about 10 minutes duration, describing Leave No Trace backcountry camping regulations and practices will be produced. Vandal- and weather-resistant informational displays will also be constructed for use at each of the stations. These displays should be constructed so that they can be easily converted to outdoor self-registration permit stations during the winter months. In addition to regulation information, these off-season

stations would provide permit self-registration procedures, permits, and a limited range of site map handouts for visitors. A presentation of camping opportunities could be displayed to assist visitors in trip planning. A "dichotomous key" (such as those used in field identification guides) illustrating a series of steps (decisions) would aid the visitor in determining where in the backcountry to camp according to individual preference and experience.

In the future, a certification system could be established which would enable repeat backpackers to obtain a permit without going through the trip planning and regulations discussion at a staffed registration station could be established. Certification in the form of a card could be issued to individuals who have attended and passed special certification courses. The card could be presented at the staffed registration station and a permit issued with only general data collection, safety, and site map information communicated. Such a system would reduce the time required in issuing the permit, therefore rewarding the "certified" visitor with not having to go through a familiar and perhaps unnecessary process. This system might be expensive to implement, but could be feasible with a computerized permitting system.

A backcountry reservations system for designated and group campsites may also be established in the future if needed and technologically feasible. This method of rationing use would be enhanced by a centralized backcountry office and a computerized permitting system. This system needs to be enforceable, which will be challenging with limited backcountry staffing levels.

Future Actions

A. Produce interpretive displays for backcountry camping permit stations (rotate use to self-registration stations during winter months).

B. Produce backcountry site bulletin/maps.

C. Emphasize face-to-face permit issuance contacts using strategies described in this section of the plan. Reduce availability of self-registration permits during peak visitor periods.

D. Establish "business hours" for backcountry camping permit issuance and publicize this information through brochures and entrance station signing. Do not issue permits outside of these hours and step up enforcement of the "required permit" regulation.

12.2 Backcountry Camping Permitting Procedures

A "Backcountry Camping Permit Handbook" will be available at each permit-issuing station The handbook includes information necessary for completing a backcountry camping permit and effectively communicating regulations to visitors. The handbook will be revised at least annually and should contain the following information:

1. Overview of backcountry camping permit purpose and issuance instructions,

2. Coding guide for backcountry camping permits,

3. Backcountry campsite codes,

4. Site bulletin/maps for campsite zones,

5. Description of backcountry rules and regulations,

6. Information on bears and food storage,

7. Park boundary access information for each district,

8. Horse use site bulletin/map information for each district,

9. Information on backcountry shelters, huts, and cabins,

10. Trail system inventory for each district, and

11. Description of water sources in each district; Giardia information.

All backcountry camping permit issuing stations must have a handbook available for use by those employees issuing permits. Employees must be familiar with the handbook and permitting procedures. It is recommended that these employees also have access to and read the BWMP to have a basic understanding of the SNP backcountry management philosophy, Leave No Trace backcountry use ethics, and management actions.

The permitting procedure consists of 6 basic steps:

1. Contact the visitor in a pleasant and professional manner.

2. Determine the visitor's interests, preparation for, and experience in backcountry camping at SNP.

3. Provide trip planning for the visitor as needed. The visitor might wish to consult and/or purchase a park map to plan the trip.

4. Inform the visitor of minimum impact camping practices and park backcountry regulations.

5. Inform the visitor of safety, weather, drinking water precautions, and other special backcountry conditions.

6. Complete the permit according to handbook instructions.

(See chapter 16.2 for **Future Actions)**

12.3 Backcountry Camping Permit Codes

Coding Guide For Backcountry Camping Permits

1. Name and Address section:

Enter the name and address of the person requesting the permit and/or the responsible group leader.

(Blocks 1 - 5)

Enter the visitor's home 5-digit zip code, if available.

2. Start and finish dates: (Blocks 9 - 17)

Give the month and day on which the backcountry trip will begin in the park (the first night in the backcountry).

Give the month and day on which the trip will end (the day of departure from the backcountry).

3. Location of entry/exit:

List (use place name) the trailhead or backcountry entry point, or where the car will be parked.

List (use place name) the trailhead or point of departure from the backcountry if different from above.

4. Number of people in group: (Blocks 26 - 27)

Enter the total number of people in the party up to 10.

Note: Backcountry regulations prohibit more than 10 persons in a camping party to help minimize camping impacts on the Park. Groups larger than 10 persons need to break up into smaller groups with each group on a separate permit and its own group leader. Groups are discouraged from hiking together and must camp at least 50 yards apart and preferably out of sight of one'another.

5. Campsite Name, Zone, Code, & Nights:

List each area the party will use for camping and the number of nights at each area. Camping is limited to 2 nights at a campsite to minimize impacts.

Camping area names will be either trail names or geographic locations. Backcountry campsite codes are listed alphabetically by district.

Campsite codes do not have to appear on the camper's copy of the permit, but need to be coded on the white copy.

If a camping party plans to stay at more than 10 different campsite areas, use one permit for the first 10 sites. Show start and finish dates for these 10 sites only. Use another permit for the remainder of trip. Clip the data copies together.

For continuity, when a camping party is spending a night off the trail in a developed area in the park (i.e., Loft Mt. Campground) show it on the permit, then code as follows:

199 - North District developed area
299 - Central District developed area
499 - South District developed area

6. Remarks:

In this area of the permit, but not necessarily in the "Remarks" block, enter the license tag(s) of the vehicle(s) in the party which will be parked at a trailhead(

Use this area of the permit to write comments such as, "Regs. Reviewed" or "Regs. Understood".

7. Signatures:

The visitor signs the permit to certify understanding of and agreement to abide by backcountry camping regulations.

The issuing employee signs and dates the permit, then gives the original permit to the visitor, instructing the visitor to display the permit on a pack while camping in the park backcountry. White and pink copies are routed to the district office, then on to park dispatch office.

For permits placed at self-registration stations, write: "Self-Reg. " and the station name (i.e., Self-Reg . , Rockfish).

8. Issuing Station: (Blocks 79 - 80)

Issuing station codes are listed by district and are used to track the backcountry permit workload at contact stations. See the attached codes.

9. Special Notes:

Four areas in the Central District have been designated as outstanding natural areas. Camping is not permitted within these areas to manage adverse impacts upon park resources

and are appropriately signed along the trails.

- Limberlost area, bounded by Limberlost Trail.
- Summit area of Hawksbill Mt.
- Whiteoak Canyon, between the first and fourth waterfalls.
- Summit area of Old Rag Mt., above 2800' contour.

Trails closed to pets: (excepting guide dogs and work dogs)

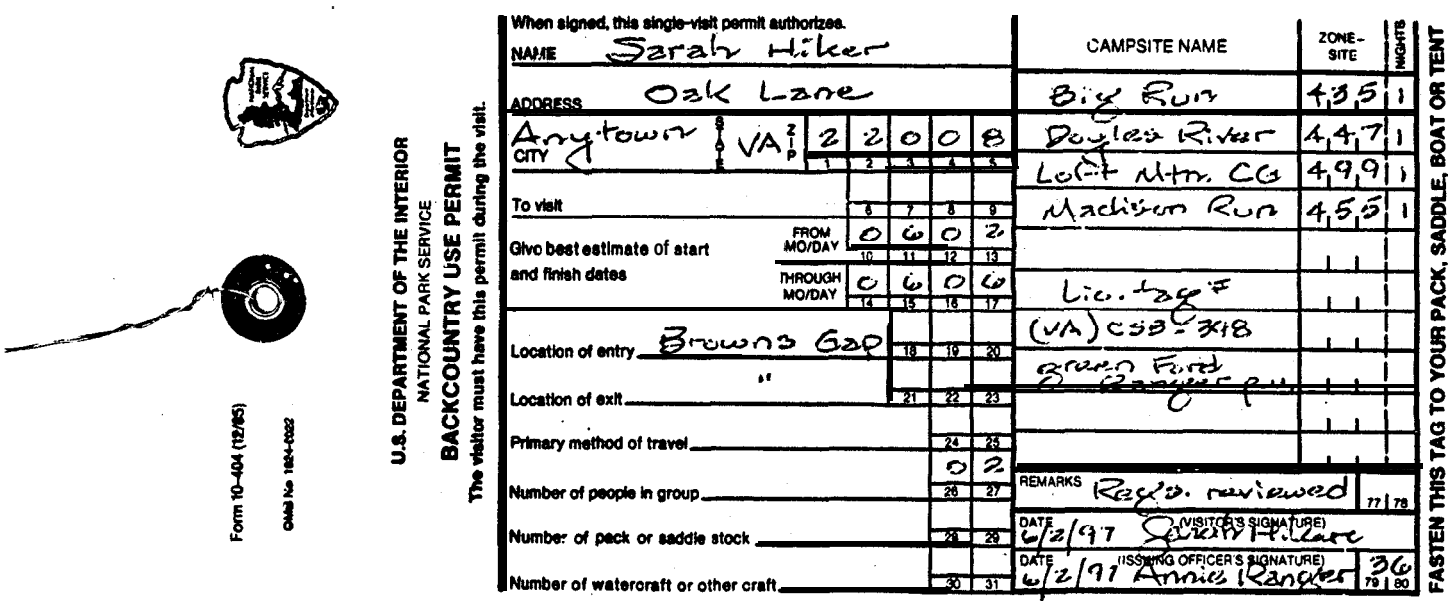
-- Nature Trails:
- Fox Hollow
- Traces
- Stony Man
- Story of the Forest (Big Meadows)
- Deadening (Loft Mt.)

-- Other trails closed to pets:
- Bearfence
- Dark Hollow Trail
- Old Rag Mt. (Ridge Trail and Saddle Trail)
- Limberlost

Figure 12.1

Sample

Backcountry Camping Permit



Form 10-404 (12/85)
OMB No. 1024-0022

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BACKCOUNTRY USE PERMIT
The visitor must have this permit during the visit.

When signed, this single-visit permit authorizes.

NAME Sarah Hiker
ADDRESS Oak Lane
CITY Anytown STATE VA ZIP 22008
To visit
Give best estimate of start and finish dates — FROM MO/DAY 06 02 — THROUGH MO/DAY 06 06
Location of entry Browns Gap
Location of exit "
Primary method of travel
Number of people in group 02
Number of pack or saddle stock
Number of watercraft or other craft

CAMPSITE NAME	ZONE-SITE	NIGHTS
Big Run	435	1
Doyles River	447	1
Loft Mtn. CG	499	1
Madison Run	455	1
Lic. tag # (VA) CSB-348		
Green Ford Ranger pu		

REMARKS Reg's. reviewed
DATE 6/2/97 (VISITOR'S SIGNATURE) Sarah Hiker
DATE 6/2/97 (ISSUING OFFICER'S SIGNATURE) Annie Ranger
36

FASTEN THIS TAG TO YOUR PACK, SADDLE, BOAT OR TENT

BACKCOUNTRY CAMPSITE CODES FOR APPALACHIAN TRAIL SECTIONS

NORTH DISTRICT	HUTS
AT boundary to Gravel Springs	101
AT Gravel Springs to Elkwallow	102 Gravel Springs
AT Elkwallow to Beahms Gap	103
AT Beahms Gap to 211	104 Pass Mt.

CENTRAL DISTRICT	
AT 2 11 to Pinnacles Picnic Area	201
AT Pinnacles Pic. Area to Hawksbill Gap	202
AT Hawksbill Gap to Lewis Spring	203 Rock Spring
AT Lewis Spring to Bearfence Mt. Hut	204
AT Bearfence Mt. Hut to Swift Run Gap	205 Bearfence Mt.

SOUTH DISTRICT	
AT Swift Run to Simmons Gap	401 Hightop
AT Simmons Gap to Loft Mt. Summit	402 Pinefield
AT Loft Mt. Summit to Doyle Riv. Ov.	403
AT Doyle Riv. Ov. to Blackrock Gap	404 Blackrock
AT Blackrock Gap to Jarman Gap	405
AT Jarman Gap to Rockfish Gap	406 Calf Mt. Shelter

MILES BETWEEN HUTS ALONG APPALACHIAN TRAIL (SOUTH TO NORTH)

Rockfish Gap (enter park)
7 <
Calf Mountain Shelter (406)
13 <
Blackrock (404)
13 <
Pinefield (402)
8 <
Hightop (401)

Hightop (401)
13 <
Bearfence (205)
11 <
Rock Spring (203)
15 <
Pass Mountain (104)
13 <
Gravel Spring (102)
8 <
Compton Gap (leave park)

NORTH DISTRICT CAMPSITE ZONES

101 AT (A) Boundary to Gravel Springs
102 AT (B) Gravel Spr. - Elkwallow Gap - (Gravel Springs hut)
103 AT (C) Elkwallow Gap - Beahm's Gap
104 AT (D) Beahm's Gap - Rt. 211 - (Pass Mt. Hut)
124 Beecher Ridge Trail
148 Beecher-Overall Connecting Trail
116 Big Devils Stairs Trail (to boundary)
115 Bluff Trail
118 Browntown Trail
142 Butterwood Branch
150 Compton Gap Trail
109 Compton Peak
105 Dickey Ridge Trail (north of DRVC)
120 Dickey Ridge Trail (south of DRVC)
129 Elkwallow Trail
134 Fork Mt. Trail
106 Fox Hollow Nature Trail (no pets)
107 Harmony Hollow
119 Harris Hollow Trail
125 Heiskell Hollow Trail
139 Hickerson Hollow Trail
138 Hull School Trail
110 Indian Run
111 Jenkins Gap Trail
128 Jeremy's Run Trail
117 Jordan River Trail
143 Kemp Hollow
130 Keyser Run Road
126 Knob Mt. Trail
153 Knob Mt. cut-off Trail
108 Lands Run Road
121 Little Devils Stairs Trail
145 Mathews Arm Trail
112 Mount Marshall Trail
127 Neighbor Mt. Trail (includes cut-off trail)
141 Oventop Mt.
123 Overall Run Trail
140 Pass Mt. Trail
155 Pass Mt. Road
137 Pignut Mt.
133 Piney Branch Trail (below Hull School Tr.)
132 Piney Branch Trail (above Hull School Tr.)
135 Piney Ridge Trail

131 Pole Bridge Link Trail
149 Rocky Branch Trail
144 Shenk Hollow
151 Snead Farm Loop Trail
154 Spring House Road
152 Sugarloaf Trail
113 The Peak
147 Thompson Hollow Trail
136 Thornton River Trail
114 Tuscarora-Overall Run Trail (formerly Big Blue-Overall Run)
122 Tuscarora Trail (formerly Big Blue)
146 Weddlewood Trail
199 North District developed area (ie. Mathew's Arm Campground, etc.)

CENTRAL DISTRICT CAMPSITE ZONES

201 AT (A) Rt. 211-Pinnacles Picnic Area
202 AT (B) Pinnacles-Hawksbill Gap
203 AT (C) Hawksbill Gap-Lewis Spr. - (Rock Spring Hut)
204 AT (D) Lewis Spr-Bearfence Mt
205 AT (E) Bearfence Mt-Swift Run - (Bearfence Hut)
344 Abrams Mountain
324 Bearchurch Rock
333 Bearfence Mountain (no pets)
213 Beech Spring Hollow
253 Berry Hollow
306 Big Fill Hollow
2 2 2 Blakey Ridge Rd.
330 Bootens Gap
229 Broad Hollow Trail
215 Buck Hollow
216 Buck Ridge
305 Buck Spring Area
332 Bush Mountain
322 Cat Knob
226 Catlett Mt.
227 Catlett Spur
222 Cave Falls
307 Cedar Run Trail 350 Cedar Run Link
291 Central District, Boundary East
292 Central District, Boundary West
299 Central Dist. Developed Area (i.e. Big Meadows Campground, etc.)
331 Conway River Fire Road
234 Corbin Cabin Cut-off
237 Corbin Hollow
238 Corbin Mountain
257 Crescent Rock
212 Crusher Ridge
342 Dean Mountain
261 Dove1 Mountain
345 Dry Run Falls Fire Rd.
206 Elder Ridge
309 Fishers Gap
321 Fork Mountain Fire Rd.
303 Franklin Cliffs
262 Grindstone Mountain
225 Hannah Run
301 Hawksbill Gap
353 Hawksbill Summit (no camping permitted)

308 Haywood Mt/Spitler Hill
220 Hazel Mountain
223 Hazel Mountain Trail
221 Hazel River Trail
351 Hensley Hollow
352 Hensley Ridge
230 Hot-Short Mountain Trail
235 Hughes River
260 Indian Run Trail
219 Jenkin's Hollow
211 Jewel1 Hollow
325 Jones Mountain Area
323 Jones Mountain Trail
245 Kettle Canyon
304 Kite Hollow
3 19 Laurel Prong
208 Leading Ridge
337 Lewis Mountain
336 Lewis Mt. East
335 Lewis Mt. West
314 Lewis Spring Area
249 Limberlost Trail (no pets; no camping permitted)
242 Little Stony Man
207 Marys Rock
209 Meadow Spring
317 Milam Gap
318 Mill Prong
246 Miller's Head
263 Naked Creed, East Branch
327 Naked Creek, West Branch
302 Naked Top
259 Negro Run
236 Nicholson Hollow
217 Old Hazel Trail
247 Old Rag Fire Road
232 Pine Hill Gap Trail
343 Piney Mountain
239 Pinnacle Peak
233 Pinnacles Ridge
338 Pocosin Area
339 Pocosin Fire Road
340 Pocosin Hollow
341 Pocosin Horse Trail
329 Powell Mountain Trail
251 Ragged Run

315 Rapidan Fire Road
326 Rapidan River
250 Ridge Trail (Old Rag Mt.) (no pets; no camping permitted on Old Rag summit above 2800 feet elevation)
241 Robertson Mountain Trail
231 Rocky Run
311 Rose River Fire Road
310 Rose River Loop
252 Saddle Trail (Old Rag Mt.) (no pets; no camping permitted on Old Rag summit above 2800 feet elevation)
349 Saddleback Mountain
228 Sam's Ridge Trail
224 Sam's Run
. 210 Shaver Hollow
214 Skinner Ridge
244 Skyland Fire Road
248 Sky land-Big Meadows Horse Tr .
334 Slaughter Fire Road
328 Smith Mountain
348 South River Area (no camping permitted)
347 South River Falls Trail
346 South River Fire Road
308 Spitler Hill/Haywood Mt.
320 Staunton River
243 Stony Man Mountain (no pets)
312 Stony Mountain Trail
315 Tanner's Ridge
240 Thorofare Mountain
258 Timber Hollow
313 Upper Dark Hollow Horse Trail
254 Weakly Hollow Fire Road
218 White Rocks Trail
256 Whiteoak Fire Road
255 Whiteoak Canyon Trail (no camping permitted between ~~first and fourth falls)~~ Upper Falls and Cedar Run Link Trail)

SOUTH DISTRICT CAMPSITE ZONES

401 AT (A) Swift Run-Simmons Gap - (Hightop Hut)
402 AT (B) Simmons Gap-Loft Mt - (Pinefield Gap Hut)
403 AT (C) Loft Mt - Doyles River Overlook
404 AT (D) Doyles River-Blackrock Gap - (Blackrock Hut)
405 AT (E) Blackrock Gap-Jarman Gap
406 AT (F) Jarman Gap-Rockfish Gap - (Calf Mt. Shelter)
459 Abbott Ridge
444 Austin Mountain
431 Bear-wallow Run
412 Beldor Ridge
472 Big Branch
435 Big Run
468 Blackrock Gap
433 Brown Mountain
445 Browns Gap
446 Browns Gap Road
474 Calvary Rocks
450 Cedar Mountain
479 Cool Spring Hollow
463 Crimora Road
443 Deep Run
495 Dorsey Hanger Hollow
447 Doyles River
499 Dundo Campground
456 Dundo Hollow
452 Dundo Reservoir Road
409 East Swift Run
420 Eaton Hollow
437 Eppert Hollow
423 Flattop Mountain
458 Furnace Mountain
413 Gap Run
485 Gasline Road
498 Goat Ridge
460 Hall Mountain
494 Hangman Run
410 Hanse Mountain
490 Hawksbill Creek
416 Hightop Mountain
417 Hightop Road
465 Horsehead Mt.
427 ivy Creek
487 Jarman Gap

448 Jones Run
467 Lefthand Hollow
442 Lewis Mountain
440 Lewis Peak
449 Little Flat Mountain
470 Little Gate Branch
432 Loft Mountain (not Loft Mt. Campground)
499 Loft Mountain Campground
411 Lower Hawksbill Creek
441 Lower Lewis Run
457 Luck Hollow
455 Madison Run
461 Miller Run
469 North Fork Moormans River (flood damaged - Day Use Only)
430 One Mile Run
466 Paine Run
436 Patterson Ridge
426 Pinefield Gap
454 Pinestand Mountain
473 Pond Ridge
496 Pond Ridge Branch
419 Powell Gap
476 Riprap Hollow
475 Rocks Mountain
414 Rocky Mount
434 Rocky Mountain Run
438 Rockytop
493 Roundtop
497 Sawlog Ridge
483 Sawmill Ridge
484 Sawmill Run
471 Shop Run
421 Simmons Gap
415 Simmons Gap-Beldor Road (west side)
422 Simmons Gap-Fork Hollow Rd. (east side)
418 Smith Roach Gap
488 South Dist. Crosscountry East
489 South Dist. Crosscountry West
491 South Dist. Boundary East
492 South Dist. Boundary West
499 South District Developed Area (i.e. Loft Mt. Campground, etc.)
486 South Fork Moormans River
462 Stull Run
407 Swift Run Gap
478 Thorofare Ridge

464 Trayfoot Mountain
481 Turk Branch
480 Turk Gap
482 Turk Mountain
429 Two Mile Ridge
428 Two Mile Run
424 Upper Hawksbill Creek
439 Upper Lewis Run
451 Via Gap
425 Weaver Mountain
408 West Swift Run
453 Wildcat Hollow (Pasture Fence Mt.)
477 Wildcat Ridge

Permit Issuing Station Codes: (Blocks 79 - 80)

North District:

Front Royal Entrance Station	11
Dickey Ridge Visitor Center	12
Mathews Arm Campground	13
Thornton Gap Entrance Station	14
Thornton Gap Information Station	15
Miscellaneous - North Dist.	16
Piney River	17
Tom Floyd Wayside Self-Reg.	19

Central District:

Byrd Visitor Center	21
Big Meadows Campground	22
Lewis Mountain Campground	23
Miscellaneous - Central Dist.	26

South District:

Swift Run Entrance Station	31
Loft Mountain Campground	32
Simmons Gap	33
Rockfish Entrance Station	34
Loft Mountain Information Station	35
Miscellaneous - South Dist.	36

Park Headquarters:

Headquarters over-the-counter	41
Headquarters by mail	42

Future Actions

A. Implement all new procedures as described in this section.

B. Develop a computerized permitting system per the approved NRPP proposal.

12.4 Backcountry Fees

A permit fee program was established at the leased Nethers parking area at park boundary for Old Rag area trails in fall 1995. This action was primarily in response to park boundary access parking difficulties and seasonally severe crowding on Old Rag trails. Some details of this permit program are described in chapter 13.2, Boundary Access.

In 1996, to address the need for funding of necessary services which have not kept pace with demand, Congress directed the U.S. Department of the Interior, including the National Park Service, to implement the Recreation Fee Demonstration Program. The program intends to help spread some of the costs for managing public lands among those who use them. The Recreation Fee Demonstration Program allows a significant portion of the fees collected at SNP to be spent directly on behalf of the Park. The program is to continue for three years, at which point the program will be evaluated. The findings will determine a fee collection policy in later years. SNP determines which activities are to be covered by fees and, in some cases, visitors will have to pay for activities that have never had an associated fee. In 1997 a fee program has been initiated at park boundary trailheads including White Oak Canyon and Old Rag area parking lots in Berry Hollow in Central District and Little Devils Stairs parking lot in North District. These fee collection stations utilize pipe safes for "honor system" payment of fees by backcountry visitors. The portion of new fees which'are to be used on behalf of the Park are for a variety of projects identified by the park staff, including rehabilitation of trails damaged in recent years by storms.

The development of a computerized backcountry camping permit system is anticipated to occur with an associated program cost recovery fee and/or a new recreational use fee.

A. Design and incorporate backcountry camping permit fees program into backcountry program planning in anticipation of permit fees to be charged to backcountry campers.

CHAPTER 13
PARK BOUNDARY MANAGEMENT

13.1 Adjacent Related Lands

"Scenic views, trout streams, black bears, lush plant life... Shenandoah National Park was created to preserve this beautiful mountain sanctuary for all to enjoy. Increasingly, we find that we must look beyond Park lands to protect the values for which Shenandoah was created. The Related Lands Study is providing information which is essential to our ability to carry out this mission. " This statement is from the July 1992 SNP Employee Bulletin describing the Related Lands Study .

The purpose of the Related Lands Study is to undertake a resource inventory of the lands with a direct ecological or land use relationship to the Shenandoah National Park. The study will for the first time, assemble all the resource information about the park and its surrounding communities in a single location. The data will be used to create a sound technical base for future joint planning activities by the park and its surrounding communities. The study is being conducted because the Shenandoah National Park can no longer be seen as an island isolated from its neighbors. The use of land surrounding the park has a tremendous impact on what happens within it. The park is interested in finding out how the changes that are occuring outside its boundary affects their ability to manage the resources within it. The park is also looking to work closely with the counties surrounding the park to develop locally based initiatives that conserve those resources that may be valued by both. In addition, the park expects that as a result of the full study, a set of criteria will be developed that can be used to evaluate the significance of lands being offered by donation..

Those issues being addressed by the Related Lands Study which have -direct impact on park backcountry recreation management includes recreation access to trails and streams, trailheads and the problems they can create for abutting property owners, and activities within the park that affect nearby private property owners.

13.2 Boundary Access

Boundary access issues often affect the relationship between the Park and its neighbors. Boundary trailheads provide easy access for many local visitors to enjoy and appreciate the park. Boundary trailheads attract much use by visitors from outside the local area and can contribute to the local economy. Many boundary trailhead areas have "guaranteed access" public right-of-ways through private lands as described in the Park's GMP. Other boundary accesses remain open to the public at the discretion and good will of the private landowner. Guaranteed boundary accesses are often the result of historical State-owned, cross-mountain road right-of-ways which existed prior to establishment of the Park. When the roads were abandoned by the State, public right-of-way access outside of the Park was often retained through otherwise private land. Some boundary trailhead accesses are located adjacent to State or County maintained roads. Unfortunately, boundary access can have negative impacts on the relationship the park

has with its neighbors. A few boundary accesses at private land receive abuse often associated with heavy visitation including illegal camping, litter, trespassing, vandalism, parking, and noise. Accesses are sometimes used by visitors with mountain bikes, ATV's, and other equipment not compatible with park values, regulations, or the desires of the abutting landowner. It is difficult to control uses and abuses on Park boundary other than with signing and intermittent ranger patrols. Some landowners who have allowed access in the past have recently closed boundary trailhead accesses citing some of the above described problems in their reasoning.

Very few boundary accesses have formal parking lots available and parking is frequently very limited or non-existant. Many accesses are unsigned and difficult to recognize or negotiate even with a good map. It is important that park employees provide boundary access condition information to visitors wishing to access the park by boundary trailhead. Park backcountry permit issuing stations and visitor centers in particular should maintain current information on boundary access descriptions.

Old Rag Boundary Access Issues

One area that receives very heavy visitor access pressure is the Old Rag boundary area. Since fall 1995 a fee permit system has been implemented at Old Rag. Objectives are to reduce the impacts to adjacent private landowner property and to mitigate human overuse in the Old Rag wilderness on weekends and holidays between Memorial Day and the last weekend in October. This is done by limiting parking to 200 cars in the temporary parking lot and charging a fee at the staffed Contact Station (where there is also a variety of backcountry and resource-related information available including backcountry camping permits, hiking route alternatives, etc.). Possession of a hiking permit is verified at the Ridge Trail Trailhead before hikers can enter the area. If there are more than 200 cars at the temporary lot, all excess cars are turned away and advised of other hiking/camping options.

As of November 1996, the fee permit system did seem to be reducing visitor impacts to landowners and visitor overcrowding/overuse effectively. During 1995-1996, visitors had to be turned away only twice at the temporary parking lot. This action will continue and will be monitored for effectiveness; the action may be modified upon completion of a visitor survey to be conducted in the near future.

Future Actions

A. Confirm all boundary access points as described by the Park GMP. Obtain guaranteed access right-of-ways at boundary access trailheads which do not have this status and abandon those accesses which do not favor public use.

B. Foster good relationships with Park boundary neighbors; assure Park administrative access for emergency use where public boundary access does not exist.

C. Perform a social science survey in the Old Rag boundary area to assess backcountry visitor perceptions of Old Rag area conditions, identify appropriate social indicators for the area, and develop an efficient monitoring program for social science indicators.

D. Examine boundary trailhead public access points for feasibility for possible implementation of a boundary access permit/fee program.

Table 13.1

NORTH DISTRICT BOUNDARY TRAIL ACCESS
(revised 2/98)

EAST SIDE:

TRAIL	USE	COMMENTS
HICKERSON HOLLOW (from Rt. #604)	Horse Foot	Good access; parking for 3 cars along roadside
NORTH AT/TOM FLOYD (Rt. #602)	Foot	Good access; parking for 3 cars along roadside
COMPTON GAP (Rt. #610)	Horse Foot	Good access from Chester Gap; parking for 5 cars
JORDAN RIVER (Rt. #629)	Horse Foot	Fair access; parking for 4 cars along roadside; trail access not plainly visible
MT. MARSHALL (Rt. #625)	Horse Foot	Good access; parking lot for 5 to 8 cars
HARRIS HOLLOW (Harris Hollow Rd)	Horse Foot	Poor access; parking limited to 1 or 2 cars along roadside
KEYSER RUN (Rt. #614)	Horse Foot	Good access; parking for about 10 cars at Little Devil Stairs parking area; do not block road
LITTLE DEVILS STAIRS (Rt. #614)	Foot	Same as Keyser Run

PINEY BRANCH (Rt. #600)	Horse Foot	Fair access; parking in the area is very limited along roadsides;. do not block gate or road
THORNTON RIVER (Rt. #612)	Horse Foot	Fair access; parking in the area is very limited along the roadside: do not block road or private driveways
PASS MOUNTAIN (US Rt. #211)	Foot	Good access from highway; parking for about 4 cars across highway
WEST SIDE:		
DICKEY RIDGE (US Rt. 340)	Foot	Parking for about 6 cars at north entrance of Skyline Drive
LANDS RUN (Rt. #622)	Horse Foot	Good access for 2 cars along roadside
JENKINS GAP (Rt. #634)	Horse Foot	Fair access; limited parking along roadside
BROWNTOWN (Rt. #631)	Horse Foot	Poor access; very limited parking along rodside; access is not plainly visible
MATHEWS ARM (Catron Rd)	Horse Foot	Poor access; very limited parking along roadside; access is not plainly visible

THOMPSON HOLLOW (Thompson Hollow Rd)	Foot	Good access; parking for 3 cars; do not block gate or turnaround area
TUSCARORA (US Rt. #340)	Foot	Fair access; very limited parking along shoulder of highway
HEISKELL HOLLOW (from Rt. #697)	Horse Foot	Poor access; not recommended
JEREMYS RUN (from Rt. #611)	Foot	Temporary access; trail relocation to Rt. #611 from boundary
ROCKY BRANCH (Rt. #666)	Horse Foot	Fair access; can be difficult to locate; parking is limited to 1 or 2 cars at base of private driveway

Table 13.2

CENTRAL DISTRICT BOUNDARY TRAIL ACCESS
(revised 2/98)

EAST SIDE:

TRAIL	USE	COMMENTS
BUCK HOLLOW (Rt. 211)	Foot	Good access; parking for 4-5 cars in pullout
HAZEL COUNTRY (Rt. 600) includes Hazel R., White Rocks, Sams Ridge	Foot Horse	Fair access; limited parking for 4 cars along roadside outside of gate; access through private land
BROAD HOLLOW (Rt. 681)	Foot	Good access; limited parking for 2 cars along roadside
PINE HILL GAP (Rt. 681)	Foot	Good public access; limited parking for 3 cars along roadside
NICHOLSON HOLLOW (Rt. 600-Nethers)	Foot	(1) Access through .5 mile of private land; parking for 4-5 cars at trailhead (2) Public access at Old Rag temporary lot for 200 cars
WEAKLEY HOLLOW (Rt. 600-Nethers)	Foot Horse	Good access; parking lot limited to about 15-20 cars (closed during permit season, weekends May-October); plus Old Rag temporary lot for 200 cars
BERRY HOLLOW (Rt. 600-Syria)	Foot Horse	Good access; parking for about 12 cars

WHITE OAK CANYON CEDAR RUN (Rt. 600-Syria)	Foot	Access through private land .2 miles; leased parking lot for 20-25 cars
ROSE RIVER (Rt. 670)	Foot Horse	Private access; limited parking for about 6 cars
RAPIDAN AREA Camp Hoover and environs (Rt. 649)	Foot Horse	Good access through park and RWMA; parking along roadside
JONES MOUNTAIN (Rt. 662)	Foot	Good access; limited parking for 4-6 cars at State parking area at park boundary
CONWAY RIVER (Rt. 615)	Foot Horse	Poor access through RMWA, road impassable .25 mile below park boundary gate; parking along roadside
SLAUGHTER TRAIL (Rt. 667)	Foot Horse	Fair access; parking for 2-4 cars at end of state road. Road washed out, in poor shape. Impassable ford across river
POCOSIN HOLLOW (Rt. 667)	Foot	No public access through private land; no parking available
POCOSIN FIRE ROAD (Rt. 637)	Foot Horse	Fair private access; road in poor shape before boundary. Limited parking along road at gate for 2 cars. Hike to Park .5 mile
SOUTH RIVER (Rt. 642)	Foot Horse	No public access. Gated and locked, no parking

WEST SIDE:

SKYLAND FIRE ROAD (Rt. 672)	Foot Horse	No public access; no parking, posted by private landowner
REDGATE FIRE ROAD (Rt. 611)	Foot Horse	Good access; limited parking along roadside for 4 cars
TANNERS RIDGE FIRE ROAD (Rt. 682)	Foot Horse	Good access; parking for 4-5 cars at lot
WEST BRANCH NAKED CREEK (Rt. 607)	Foot	Good access; parking for 5 cars. Not recommended, trail obliterated by flooding
EAST BRANCH NAKED CREEK (Rt. 759)	Foot	Poor access on private land; no parking
POWELL MOUNTAIN (Rt. 759)	Foot	Good access; limited parking along road for 1 car
MEADOW SCHOOL (Rt. 759)	Foot	Good access; parking for 5 cars. Trail in poor condition
DRY RUN (Rt.625)	Foot Horse	Fair private access; road before boundary in poor condition; limited parking for 3 cars

Table 13.3

SOUTH DISTRICT BOUNDARY TRAIL ACCESS
(revised 2/98)

EAST SIDE:

TRAIL	USE	COMMENTS
SMITH ROACH GAP ROAD (from Rt. #626)	Horse Foot	Fair access; parking for 2 cars near park gate
SIMMONS GAP ROAD (Rt. #628)	Horse Foot	Good access; parking for 2 cars near park gate
BROWNS COVE (Rt. #629)	Horse Foot	Fair access; limited parking along road, 1.2 miles from park boundary
NORTH & SOUTH FORK MOORMANS RIVER ROADS (Rt. #614)	Foot	Good access; parking for 10+ cars above Charlottesville Reservoir; parking for 4 cars near park gate on NFMR road (NOTE: due due June '95 flooding, NFMR road is day use only; closed to horse travel)
BUCKS ELBOW ROAD/JARMAN GAP (Rt. #611)	Horse Foot	Fair access; parking for 1 car at park gate; limited parking along road

WEST SIDE:

TRAIL	USE	COMMENTS
GAP RUN (from Beldor Hollow Rt. #628)	Foot	Poor access; 1 or 2 cars at pull out off Rt. #628

BELDOR ROAD/ SIMMONS GAP (Rt. #628)	Horse Foot	Good access; parking for 2 cars near park gate
ONE MILE RUN (Rt. #649)	Foot	No access; no parking, all private land is posted
BIG RUN PORTAL (from US Rt. #340)	Horse Foot	No access; no parking, all private land is posted
LEWIS PEAK (from Rt. #708)	Foot	No access; all private land is posted
MADISON RUN (Rt. #663)	Horse Foot	Good access; parking for 5 cars along road near junction of Rt. #663 and #708
PAINE RUN (Rt. #661)	Horse Foot	Fair access; parking for 3 cars at private turn-around at end of Rt. #661; No public access from Rt. #614
RIPRAP (from Rt. #612)	Foot	Fair access; parking for 2 cars at boundary; stream crossing may be rough; access confusing because of private development area
TURK GAP (from Rt. #612)	Horse Foot	No access; land is posted; route is difficult to find
GASLINE ROAD (Rt. #611/622)	Horse Foot	Poor access; limited parking along road; access is double gated on private land, but hikers & horse riders are welcome

13.3 Visitor Use Measurement

In addition to monitoring resource and social conditions in the backcountry, some measurement of the volume of visitor use in backcountry areas contributes to decisions on management actions. Backcountry visitor use statistics are maintained by the park headquarters dispatch office.

Backcountry overnight visits are determined from backcountry camping permit information (from camping party size and number of nights spent) and from PATC cabin use records. Backcountry camping permit visitor night information is routinely reported to the dispatch office at the end of each month by district offices or permit issuing stations. Presently there is no reliable system established for monitoring and tabulating general backcountry day use on park trails except for at boundary trailhead areas.

Park boundary access visitor use is monitored by a variety of methods throughout the park and is routinely reported to the dispatch office at the end of each month. The individual district operations use different strategies and systems to monitor boundary access use and to determine visitor use figures according to their needs and staffing levels. The following equipment and systems can be used to monitor this use:

A. **Trail register boxes** are designed and intended for visitors to voluntarily sign in on a register sheet (see sample in Appendices) at boundary trailhead locations. Information developed from register sheets may include a group leader or organization name, number of visitors in group, day or overnight hiking trip, and hike destination. The register box system enables park managers to monitor visitor use trends at specific boundary trailhead locations. The sign-in sheets are maintained in a roofed wooden box, mounted on a post, which has a drop-down front door to which the sheets are attached. Individual boxes may be checked a few times each month to monitor trail use conditions and develop trail boundary access use figures, Individual districts will have their own procedures for maintaining and monitoring the boxes.

B. **Trail counter systems** may be used in conjunction with boundary trailhead register boxes to establish a multiplier for register sheet figures compared to "actual" counter figures. The counter can be moved to various register box locations in the backcountry to assist in producing fairly reliable register box figures. Trail counter systems may be used on their own in backcountry locations to monitor visitor use volume trends. Types of trail counter systems include electronic infra-red sensor equipment, buried sensor pad equipment, and equipment which may permit mounting of camera monitors. Counter systems can be designed to measure specific types of trail use, such as mounting of specialized equipment to monitor stock use.

C. **Traffic counter systems** may be used in parking lot areas or on boundary area road surfaces. to monitor and measure the volume of vehicle use at a park

boundary trailhead. A multiplier may be developed to account for the number of passengers occupying vehicles to determine a reliable visitor boundary access figure.

D. **Head counts** provide the most accurate means of developing backcountry visitor use figures and monitoring levels of backcountry use. However, this method is extremely costly in terms of staffing commitment. It might be used in conjunction with other measuring systems to confirm reliability of other systems being used or to develop multipliers with other systems.

13.4 Boundary Marking Guidelines and Standards

The objective of maintaining the Park's boundary markings is to identify to any park visitors, neighboring landowners, and NPS or other agency personnel from points external to the boundary the definitive location of SNP boundary. This is particularly important in park resource protection involving such activities as fishing, hunting, ginseng gathering, timber removing, firefighting, and controlling of land development encroachment. Successful enforcement of resource protection laws on the Park boundary critically depend on the quality of boundary marking maintenance. A planned cyclic marking program is encouraged since many changes can occur to boundary identification over time: marked trees die and fall down, paint gets old and fades, squirrels or other animals gnaw and destroy signs, growing vegetation obstructs markings, signs can fall down, and signs are sometimes vandalized. Neglect of boundary marking makes it more difficult to maintain accurate and credible boundary identification in future years.

General Guidelines

The following guidelines have been developed for the field staff to effectively, efficiently, and consistently mark Park boundary.

Park boundary should be marked on an interval of 6 to 7 years. Each district should complete marking of at least 15 % of its boundary each year to meet this goal.

Avoid trespass of private land; obtain permission from any landowner whose property must be crossed to access the boundary. If possible, get permission to use any private roads. Check for standing permission from the landowner for NPS access or try to develop this agreement with landowners at important access areas. Cooperation with and respect for landowning neighbors is crucial to maintaining and improving neighbor attitudes about the park. It is important that boundary marking personnel understand that they are ambassadors representing the park and should go out of their way to communicate and cooperate with park neighbors.

Most boundary marking is accomplished in the late fall or early spring when vegetation is sparse, working temperatures comfortable, field staffing is improved over winter levels, and remote boundary areas are more accessible. As spring green-up progresses, well-placed

boundary markings can become hopelessly obscured and make boundary marking maintenance nearly impossible.

Park boundary identification must be accurate!

Documenting boundary marking work

In order to know what boundary areas are in need of maintenance and to maintain a cyclic boundary marking schedule, work completion records must be kept. Park survey monuments, which are numbered and set in concrete, are located on the ground (primarily at boundary corners and turns) along the entire Park boundary and are denoted on U.S. Geological Survey quadrangle maps. Current boundary maps are available from the Park surveyor. If there is difficulty in locating the boundary in the field, arrange to mark it when the surveyor can accompany a marking trip to locate the boundary.

Completed boundary marking can be tracked from one survey marker to another on an annual or seasonal basis. A record should be used to document marking dates, crew member names, starting and ending location points (perhaps using corner survey marker points), distance completed, observed disturbances or encumberances across the boundary (ie. rights of ways, roads, powerlines, encroachments, etc.), and boundary accesses used (including Park neighbor identification when private land is accessed). As a suggested example, a recording form is attached to these guidelines. Some boundary areas are rarely visited by NPS employees except when boundary marking work is accomplished. Therefore, the marking crew should be observant of any conditions along boundary which may be of concern to Park management; subsequent documentation of this information is very important.

Marking: the boundary

Paint

- Use bright red or orange paint.

- Paint blazes should be rectangular in shape, at least four inches wide by five inches long, and at least five feet off the ground.

- Try to apply a very thick coat of paint (thick enough to last 10-15 years). Pour off (and properly dispose of the "pouroff") the top inch or two of lacquer in each gallon to thicken the paint. Spray paint or use of paint sprayers is not recommended. Use a good sturdy brush to get paint thickly into cracks in tree bark.

- Repaint all old blazes (if they appear to be on the line) and paint new ones as needed. **Make sure that no trees are blazed outside of the park.** When in doubt, err to the inside of the park. Use trees within three feet of the actual boundary if possible. Keep in mind that some trees may die and fall prior to the next marking and that visibility of markings are reduced substantially after spring leaf-out, so blaze generously.

- Restore and paint rock cairns found along the boundary line by marking a line across the rockpile parallel to the boundary line. These are often the most accurate representatives of the surveyed boundary. When marking boundary, try to use these rock cairns as reference points to keep the boundary line straight and accurate. Workers may have to walk ahead to locate a cairn, then return to where marking was left off to reduce erroneous marking.

- When the boundary line passes through an area with much exposed rock and no trees are available to mark, look for old blazes on rocks which should be repainted.

- To mark a previously unmarked tree, cut a blaze in the tree with a sharp hatchet or use a paint scraper to remove bark. Do not injure the tree by cutting into the cambium. Paint this to make the paint last much longer.

- Mark only the longest-lived tree species possible. Avoid marking short-lived small tree species such as striped maple except as a last resort.

- Make sure that blazes face outside the park.

- On larger trees, two paint blazes may be needed (see Figure 13.1).

- The boundary should be marked so that a blaze or slat can be seen from one to the other in either direction along the boundary. Use more blazes at boundary access points (ie. roads and trails) and developed areas.

- Use three hacks in a vertical line down a tree to signify a boundary corner. A hack is a straight chop into a tree (but not into the cambium) that will last for many years and is easy to identify. If a corner is marked in this way, mark it again even if it doesn't look like a corner. Mark unmarked corners as such only after confirming to make absolutely sure (see Figure 13.2). A corner is confirmed by a numbered brass marker cemented to a well-anchored rock (sometimes covered with years of soil and debris), usually marked with a rock cairn.

Slats

- Plastic or metal slats which identify the boundary as US/NPS lands are available at the Park warehouse and district offices and are ordered through the Procurement Officer. At least 500 of these should be available in each district to meet seasonal boundary marking needs.

- Try to slat every other tree in high use areas, but be more sparing in more remote areas of boundary. Allow the nails to stick out from the slat about an inch to allow for tree growth.

- If a slat is already in place and in good shape, just add nails (with one inch allowance)

to give the tree growing room. Leave all old slats unless out of bounds or in very poor condition.

- Use aluminum nails or other rust resistant nails at least two inches long with large heads. The south district has used #8 galvanized steel nails with good success.

- Use the large horizontal metal slats to mark corners (see the guideline section on corners in the paint standards above). These can also be used on any large prominent trees since the newer plastic slats will probably last only 6 to 10 years.

- Try to slat trees immediately adjacent to trail junctions, old paths, and fishing streams.

- Try to avoid putting slats on short-lived tree species. Do not slat dead or dying trees.

Guidelines for Boundary Marking of Land Surveved in the 1990s

In the 1990s, as the park boundary changes through land donation, land exchanges, or correction of existing marked lines, much boundary survey work is being performed by private contractors. Modern surveying and boundary marking techniques have changed significantly from those of the 1930s when most park boundary was surveyed.

The most important change is that “corner trees” are no longer being established and referenced. Corner survey monuments and “point on tangent” monuments are established using aluminum monuments with flared bottoms set in the ground. The monument is then referenced by three “bearing trees” which triangulate to the monument location. A bearing tree is marked by removing a portion of the bark at the base of the tree, then inscribing the letters "B" over "T" on the exposed wood surface, then setting a nail. This area is then painted orange. Bearing trees would be used to re-establish a corner if the corner monument is lost or destroyed.

When a section of boundary is remarked, there is no need to repaint the bearing trees, but it is helpful to choose and paint an “unofficial” corner tree in the traditional style used elsewhere to make those corners easier to find in years to come.

Other different marking techniques that you might find are:

1. Trees that are “on line” will be marked or painted on either side of the tree as if to show the boundary line passing through the tree.

2. Only trees which are within 3 feet of the survey line are marked or painted. Therefore, the new line may have to be repainted by NPS staff when a surveying contract is completed to have adequate paint marking the line.

3. Contract survey work usually only includes setting monuments and painting new boundary line. Slatting is performed by NPS staff.

As of 1992, the newest style of vertical NPS boundary slat supplied by GSA is a fiberglass type slat with decal type lettering without nail holes. It might be preferred to pre-drill nail holes before taking the slats into the field. It is unknown how well the decal lettering on the fiberglass slats will hold up to the natural elements.

Figure 13.1 Two paint blazes are often needed on larger trees

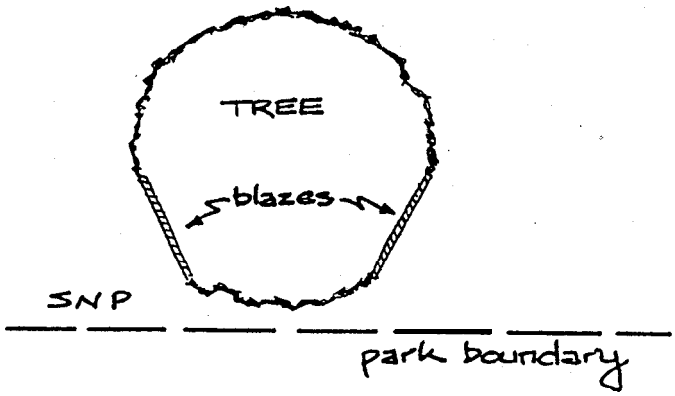
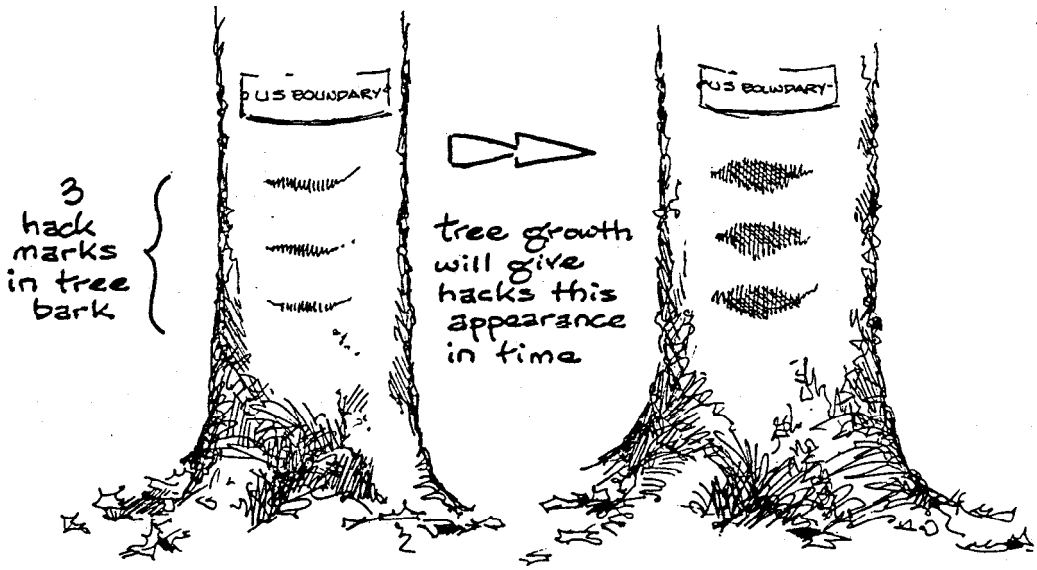


Figure 13.2 Marking a tree to signify a boundary corner



Future Actions:

A. Assure that each district has staffing to perform routine seasonal boundary marking; perhaps develop a crew which rotates between this and other backcountry maintenance responsibilities.

CHAPTER 14
BUDGET AND STAFFING NEEDS

Most elements of the BWMP can be implemented with existing park staff. Some sections of this plan are subject to the objectives and performance of other park management plans, from whose budgeting and staffing limitations have significant impacts on backcountry management action. Specific management plans which directly impact some backcountry management needs include hazard tree management and cultural resources management.

Staffing Needs Assessment

To achieve the monitoring programs and management actions described in this plan and including overall backcountry law enforcement operations, the following staffing needs are identified:

A. 1 GS-11 Supervisory Resource Management Specialist, to administer the parkwide backcountry and wilderness management program including the backcountry camping permit system, trails management, boundary management, campsite management, backcountry visitor use monitoring, other backcountry planning and programs (in addition to natural/cultural resource management and other duties) **(1 FTE) (1998 funded: 1 FTE @ 1 GS-11);**

B. 1 GS-9/11 Supervisory Resource Management Specialist, to manage the parkwide trails program, including other backcountry and wilderness program responsibilities **(1 FTE) (1998 funded: 1 FTE @ 1 GS-9 Park Ranger);**

C. 1 GS-9/11 Supervisory Resource Management Specialist, to provide parkwide backcountry and wilderness program assistance **(0.25 FTE) (1998 funded: 0.25 FTE @ GS-9);**

D. 1 GS-9 staff ranger, to administer parkwide field backcountry management program and backcountry office with collateral duties **(1 FTE) (1998 funded: 0 FTE);**

E. 3 STF GS-7 (BioTech) work leaders to direct a variety of backcountry monitoring and management programs within each administrative district (in addition to other RM) (2 **FTE) (1998 funded: 2 FTE @ 1 GS-5 term appt. and 2 GS-5 temporary);**

F. 1 STF GS-4 clerk to manage a centralized backcountry office in one of the administrative districts (administrative tasks, coordinate backpacking permit system, manage computerized programs) **(0.75 FTE) (1998 funded: 0 FTE);**

G. 3 temporary GS-4 (BioTech) field workers, each assigned to an administrative district to perform a variety of tasks including backcountry sign management, district backpacking permit system management, construction and maintenance of designated

backcountry campsites, rehabilitation of impacted backcountry campsites, document backcountry visitor use information, and conduct campsite and other monitoring programs (in addition to other RM) **(1.5 FTE) (1998 funded: 0 FTE);**

H. 3 WS-(3?) trails supervisors ((Maintenance Worker Supervisor), each assigned to an administrative district to direct and supervise a trail crew and perform trail maintenance, trail condition evaluations, and park boundary marking, coordination with trailwork volunteers, and general trail system management (3 **FTE)** (1998 **funded: 3 FTE @ WG-6 MVO);**

I. 3 STF WG-5 (Maintenance Worker), 1 assigned to each administrative district to perform as assistant crew leader in trail maintenance and boundary marking (2.1 **FTE) (1998 funded: 1.25 FTE @ 1 WG-3 MVO, 1 WG-5 MVO)**

J. 6+ temporary WG-3 (Laborer), 2 assigned to each administrative district to perform trail maintenance and boundary marking **(4.5+ FTE); (1998 funded: 4.5 FTE @ 5 temporary WG-3 laborer, 1 temporary GS-4 ForTech)**;

K. 4 GS-9 backcountry law enforcement personnel, one each assigned to north and south districts and two assigned to the central district to perform backcountry patrols, investigations for resource protection, and monitoring for park boundary encroachments and special use permit compliance (these district positions may be shared with and supervised by district frontcountry/backcountry law enforcement operations) **(4 FTE) (1998 funded: approximately 2 FTE);**

L. 7 STF GS-9 backcountry law enforcement personnel, two each assigned to the north and south districts and three assigned to the central district to perform backcountry trails and resource protection patrols (these district positions may be shared with and supervised by district frontcountry/backcountry LE operations) (6.4 **FTE) (1998 funded: approximately 2 FTE);**

M. 3 temporary GS-7 interpretation/education personnel, one assigned to each of the administrative districts to provide minimum impact backcountry camping workshops for the public, provide interpretive backcountry/wilderness programs, contact backcountry users at busy trailheads, produce interpretive backcountry brochures, video programs, etc., as needed **(1.5 FTE) (1998 funded: 0);**

N. 3 temporary/part-time GS-4 and 1 full-time temporary GS-5 lead Visitor Use Assistants to perform visitor contacts, administer Old Rag permit system, issue backcountry camping permits, manage contact station at Weakly Hollow/Old Rag **(1 FTE) (1998 funded: 1 FTE)**

0. 1 GS-11 Archeologist to do site-specific archeological clearances on all new and rehabilitated .backcountry campsites, trails, etc. **(1 FTE) (1998 funded: 0)**

P. 1 GS-9 Wilderness Education Coordinator to administer and conduct backcountry and wilderness education programs, direct the regional NPS Leave No Trace program, coordinate interagency and organizational outreach education programs, perform budgeting and manage a grants program **(1 FTE) (1998 funded: 0.50 FTE @ 1 term appt. Park Ranger)**

Recommended TOTAL FTE: 32.00 1998 FUNDED FTE (approx.): 18.50

Other Staffing and Budget Needs/Funding

In addition to recommended staffing to be funded by ONPS, in fall 1996 the Park received approval of a Natural Resources Preservation Program (NRPP) request to implement this BWMP over a three-year period beginning in FY99. Project costs are included in the NRPP proposal (RMP Project Statement SHEN-N-030.002) which is attached in the Appendices (chapter 16.3).

Future Actions

A. Strive to meet staffing needs to improve the ability of the SNP backcountry/wilderness program to meet GPRA goals.

B. Manage NRPP planning to successfully accomplish BWMP implementation.

CHAPTER 15
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Shenandoah National Park
Backcountry and Wilderness Management Plan

ENVIRONMENTAL ASSESSMENT
COVER SHEET

Proposed Action: Approval of the Shenandoah National Park Backcountry and Wilderness Management Plan.

Type of Statement: Environmental Assessment

Agency: National Park Service, Shenandoah National Park

For further information:
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Abstract: Shenandoah National Park (SNP) has determined that its existing backcountry management system, developed and implemented in the mid-1970's, does not adequately address the impacts of recreational backcountry use on natural and cultural resources and the visitor experience. Direction is needed to assure that SNP's backcountry and wilderness resources and character are enjoyed, protected, preserved and restored for the benefit of this and future generations. The Park proposes a Backcountry and Wilderness Management Plan (BWMP) which builds on the existing program and would provide the guidance for accomplishing these goals and meet NPS policy requirements and recommendations.

SNP has chosen as the preferred alternative to approve and implement the draft BWMP. The BWMP provides a balance of backcountry resource protection and visitor recreation use to meet the NPS dual mandate to protect Park resources while simultaneously providing for visitor use and enjoyment. The EA also assesses the potential impacts of three alternative proposals which explore the balance of backcountry resource protection and visitor use. Resource and social impacts of the preferred alternative are negligible.

Approved:

Douglas K. Morris
Superifitendent, Shenandoah National Park

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Shenandoah National Park

Backcountry and Wilderness Management Plan

ENVIRONMENTAL ASSESSMENT

The purpose of the Environmental Assessment (EA) is to identify the environmental consequences of the proposed action and alternatives for managing Shenandoah National Park (SNP) backcountry and wilderness, and to determine significant impacts of the alternatives on the quality of the backcountry visitor experience.

The EA assesses programmatic impacts of each of the proposed management alternatives. Environmental compliance on specific actions, undertaken as part of the approved SNP Backcountry and Wilderness Plan (BWMP), must be performed as warranted on a case-by-case basis.

Purpose and Need

Management direction is needed to ensure that SNP's backcountry and wilderness resources and character are enjoyed, protected, preserved and restored for the benefit of this and future generations. A backcountry and wilderness plan would provide the guidance for accomplishing these goals.

In the National Park Service (NPS) Organic Act of 1916 (39 Stat. 535, 16 USC 1) which estabiished the NPS, clearly Congress intended park visitation to be contingent on the ability of the NPS to preserve park environments in an unimpaired condition. What constitutes an "impaired" resource is ultimately a management determination. Similar language is used in the Wilderness Act of 1964 (16 USC 1131-l 136), applicable to parks with designated areas within their boundaries. Several statements in NPS Management Policies (1988) specifically require and guide the development of planning documents which address backcountry and wilderness management: "Backcountry use will be managed to avoid unacceptable impacts on park resources or adverse effects on visitor enjoyment of appropriate recreational experiences. The NPS will identify acceptable limits of impacts, monitor backcountry use levels and resource conditions, and take prompt corrective action when unacceptable impacts occur. Management strategies designed to guide the preservation, management, and use of the backcountry and to achieve the park's management objectives will be integrated into the park's backcountry management plan." (Chapter 8:3) Furthermore, Management Policies directs that "each park containing wilderness will develop and maintain a wilderness management plan to guide the preservation, management, and use of that wilderness." (Chapter 6:4)

Since 1984, a Backcountry Management Plan (BMP), based on park backcountry management strategies and actions generally developed and implemented in the 1970's, has provided the guidance for managing the backcountry and wilderness of SNP. The 1984 BMP outlines desired backcountry and wilderness conditions in general terms and lacks specific management

objectives. The 1998 revised BWMP, which has been in continuous update in draft form since public review in 1994, includes servicewide and parkwide operational and organizational changes that have occurred over the past several years.

The proposed action, adoption and implementation of the BWMP, provides specific management objectives and direction to meet objectives to assure that directives in Management Policies, the Wilderness Act, and other applicable laws and mandates are fulfilled. The BWMP should be reviewed and updated annually with minor modifications made as necessary. At least every five years an evaluation should be made to determine if comprehensive changes with significant public participation is needed or development of a new BWMP is required.

Physical Description of the SNP Backcountry Resource

SNP's backcountry includes approximately 196,000 acres. Nearly all areas of the backcountry are returning to forested conditions from substantial human habitation and land use which occurred up until the early 1930s when the park was established. Traces of the mountain culture are still quite evident in the backcountry and are described later in this chapter.

Backcountry topography is typical of the Appalachian mountain range with steep ridges and numerous stream drainages fed by mountain springs and precipitation runoff. Streams vary in size, but are typically small with frequent cascades and waterfalls. The ridges are characterized by thin, rocky soil and exposed rock formations. Elevations ranging from approximately 500 to 4,000 feet create a diverse ecosystem resulting in a wide variety of native flora and fauna. Vegetation is eastern deciduous forest type and seasonally dense. White-tailed deer, black bear, bobcat, wild turkey, ruffed grouse, and other woodland wildlife abound. A detailed description of park backcountry natural resources can be found in the Park's Resource Management Plan.

The backcountry includes 79,579 acres of legislatively designated wilderness area comprising 40.6 % of the park's total acreage. These areas do not include facilities or roads and include primitive trails as the only development. Wilderness boundaries are not physically identified in the backcountry except by large rock barriers placed on former fire roads to prevent motorized vehicle entry.

Approximately 116,000 acres of the backcountry is non-wilderness. Facilities in the backcountry include cabins and huts operated and maintained by the Potomac Appalachian Trail Club as overnight lodging and a few day-use shelters maintained by the NPS. Most backcountry facilities are located in the Central District. Camp Hoover, a former presidential retreat, is now rarely used as a conference and special activities facility and is actively interpreted to visitors during the summer months. White Oak cabin is sometimes in use as a ranger residence. Structural remains of past mountain culture are located throughout the Park. These remnants are generally not maintained and are subject to natural weathering forces. Other development includes powerlines, gaslines, radio/microwave antennas, and gravel administrative roads.

The primary backcountry development is in the over 500 miles of hiking and horse trails. This vast network of trails allows for many circuit hike possibilities and provides backcountry users with a variety of challenges and opportunities. Park trails can be accessed from the park boundary or Skyline Drive. Many trails exist on former mountain roads which twist and wind up ridges and down drainages. The nationally designated Appalachian Trail (AT), which traverses the Appalachian mountains from Maine to Georgia, follows the crest of the park parallelling and often crossing the Skyline Drive for 95 miles. Attractions for many backcountry users include scenic vistas, numerous small streams and waterfalls, wildlife viewing, nature study, and solitude.

Description of Natural Resources

Geology

The Blue Ridge Mountains of SNP are a part of the Appalachian physiographic region. The Park is bounded on the east by the Piedmont plateau and on the west by the Shenandoah Valley. The mountains are dissected by streams of varying sizes and the mountain crests contain many rocky cliffs, rock outcrops, and talus and scree slopes.

The geology of the section of the Blue Ridge Mountains located within the park is one of the most outstanding natural features of the area. The exposed formations are among the oldest in North America. The geologic history of the park is the subject of frequent investigations by both eminent geologists and university students. Seven principal rock types form the bedrock of the area, including granitic types (Old Rag granite and Pedlar formation), granitic and volcanized conglomerate types (Swift Run formation), metamorphosed volcanic types (Catoctin formation), and metamorphosed sedimentary types (Weaverton, Hampton, and Erwin formations).

Flora

SNP contains one of the nation's most diverse botanical reserves. The documented flora of the park includes nearly 1,400 species of plants, many of which are found along the forest edge, on exposed rocky mountain summits, and in meadow or bog areas. The eastern deciduous forest here is located in a transitional zone between northern and southern vegetation, so that higher elevations and/or north-facing slopes are often dominated by northern species, while lower elevations or more southerly slopes contain species representative of a central hardwood forest. Because SNP is located in this transitional zone, many plants exist in the park either near the northern or southern terminus of their natural range. Several of these are known to be glacial relics, species that survived the Pleistocene Ice Ages in the Blue Ridge Mountains. They persist at high altitudes, in bogs, or where special climatic features exist.

Seven primary forest types are classified as the following in order of prevalence: chestnut oak, yellow poplar, cove hardwood (consisting of ash, red oak, and basswood), Red Oak and associates, pine (consisting of eastern white pine, Virginia pine, and pitch pine), black locust, and hemlock. The richest and most diverse forest type, occupying hollows or coves occurring

in valley bottoms along the mountain slopes, is the cove hardwood forest. This last habitat is considered optimum for plant growth.

The park contains some unusual botanical areas. The Big Meadows Swamp is a true wetland and contains a wide variety of water dependent flora and fauna. Many of the plants on the park's list of rare and endangered species are found only in the Big Meadows Swamp. Other mountain bogs occur at the headwaters of streams and at seeps and contain unusual and rare botanical species. Cliffs and rocky slopes in the park are mostly north- and west-facing areas that support fragile populations of plants, some of which are tundra varieties, A description of unusual botanical areas and the unusual flora and fauna species found within them is provided in A Natural Heritage Inventors of Mid-Atlantic Region National Parks in Virginia: SNP (Ludwig et al, 1993). Relevant to the BWMP, this "Natural Heritage Resources" report includes in its summary recommendations: ". . . Incorporate natural heritage resource area information in the planning, management, and maintenance documents of SNP.. . . " Some of the information has been incorporated into this BWMP, but study will be required to further address the impacts of the report on SNP backcountry management.

Fauna

Those who explored the Shenandoah Valley and Blue Ridge Mountains in the early 1700's described an abundance and variety of animals. As European settlers cleared the land, exotic species were introduced and the abundance and variety of hunted native animals decreased. A number of native species disappeared, while the populations of many other species decreased. Through the 20th century many animal species were eliminated. White-tailed deer were nearly eliminated by the 1920's and populations of black bear, turkey, elk, and bobcat were reduced substantially.

Since establishment of the park in 1935, some extirpated species have been successfully reintroduced into the recovering forest, and some have recovered without human assistance. Deer were released in the park in 1934 and additional deer entered the park from the Massanutten Mountains in 1938. The deer herd increased gradually and now is roughly estimated at a total park population of about 6,000 animals. Turkeys were reintroduced in 1934 and were introduced on private adjacent lands in the 1950's. Wild turkeys have become a common species, having multiplied to' fill all available habitat. Black bear re-established naturally as the land became reforested. In 1989, following an extensive research period, the black bear population was estimated at over 300 animals and now appears to be stabilized. Bobcats are now common in the park, however the number and distribution of this species is unknown.

The opossum, raccoon, skunk, gray fox, and eastern cottontail are other more commonly seen mammals in the park. Over 200 species of resident and transient birds are known to use the park's habitat. A large diversity of reptile and amphibian species exists at SNP and includes 6 species of turtles, 3 species of lizards, 23 species of snakes including 2 poisonous species (timber rattlesnake and copperhead), 17 species of salamanders, 3 species of toads, and 10 species of frogs. In 1989, the Shenandoah salamander was listed as an endangered species. The

Peregrine Falcon was reintroduced to the Hawksbill area in 1989 and successful nesting has occurred in the mid-1990's.

Twenty-two species of fish have been recorded in park waters. Of the approximately 90 small streams in the park, 46 are classified as brook trout streams.

Description of SNP Backcountry Recreational Activities

To many visitors, SNP's backcountry is a day use area in which to pursue hiking and nature study activities. However, the Park receives substantial overnight backcountry use. Primitive camping is permitted in the backcountry but visitors must obtain a free backcountry camping permit at designated park facilities or from self-registration stations. Park regulations and trail use information are conveyed or posted at each permit station.

Horseback riding is a popular activity and a number of trails are designated for horse use, which is restricted to these trails. Short, guided day trips are available seasonally with the park concess ioner .

Bicycle use, including mountain bikes, is restricted from the backcountry.

Shenandoah's numerous mountain streams provide some of Virginia's finest native brook trout fishing. "Catch and Release" recreational fishing is permitted parkwide, with some streams designated as "closed" to fishing and others designated as regulated "open for harvest" fishing, from which fish may be kept subject to size and creel limitations.

Rock climbing in the park is increasing in popularity. Numerous exposed rock cliffs, particularly in the Old Rag Mountain area, attract technical and free climbing enthusiasts. Presently, climbing is not specifically regulated. The BWMP recommends that a rock climbing plan be developed to manage impacts associated with this activity.

Cross-country skiing in the park is limited by available winter snow cover. Snow cover varies widely from year to year and by elevation; historically, snow cover is frequently inadequate to support cross-country skiing. However, with sufficient snow this can be a highly enjoyable and popular backcountry use opportunity on park trails and service roads. Trails are not maintained for cross-country skiing and this activity is not regulated.

Hang gliding is restricted to three backcountry launch sites in the park near the Skyline Drive and a fee is required to obtain a special use permit. It is the responsibility of the user to identify and obtain landowner permission for landing sites outside of the park. Landing within the park is not permitted. Hang glider activity is infrequent.

. All plants and animals are protected in SNP. The collection of artifacts and relics is also strictly prohibited. However, it is permissable to pick fruiting bodies (ie. fruits, nuts, mushrooms) for

personal consumption. These seasonal foraging activities add to the ranks of day users during the "harvest" seasons, especially during the April/May morel (mushroom) season.

Proposed Action and Alternatives

The EA presents four alternatives for management of SNP backcountry and wilderness. The alternatives include **Alternative A (No Action), Alternative B (Proposed Action), Alternative C (More modified environment),** and **Alternative D (Less modified environment).**

Brief Description of Proposed Action and Alternatives

Alternative A (No Action): This alternative is the 1984 BMP and present action which is based on backcountry and wilderness management philosophy, strategies, and actions generally developed and implemented in the 1970's. The BMP references backcountry management for mitigation of "unacceptable conditions. " The BMP campsite management strategy is that of parkwide dispersal camping with a few area closures at sites determined to be environmentally sensitive to recreational use due to special natural conditions or scarcity of legal campsites. Backcountry regulations addressing specific visitor behavior impacts to the resource include prohibition of campfires, glass containers, camping within sight of trails and roads, party sizes exceeding 10 persons, camping within 25 feet of water sources, and requires proper storage of food from wildlife and proper disposal of human waste, among a few other requirements. Visitors must obtain a free backcountry camping permit to legally camp. The BMP assigns specific responsibilities to each of the park divisions to accomplish aspects of backcountry management and trails maintenance.

At the time of the BMP's inception, it was on the national forefront of backcountry planning and management. However, while the existing backcountry management system has been successful in much of the backcountry, the impacts of recreational backcountry use on some natural and cultural resources and the visitor experience are noticeably unacceptable. Some management strategies have become outdated and the BMP needs revision to reflect many servicewide and parkwide operational and organizational changes.

Experience has shown that SNP's dispersal camping regulations have been largely unsuccessful in dispersing visitors camped in the backcountry. An extensive campsite inventory completed in 1983, nine years after implementation of the dispersal regulations, revealed approximately 1,300 identifiable campsites. More importantly, 80% of these campsites were judged to be in violation of the "within sight of trail" regulation, and 25 % were in violation of the "within 25 feet of streams" regulation (Marion and Haskell, 1988). A decade later, a second, more comprehensive survey located approximately 700 campsites, 68% of which were judged to be in violation of one or more locational regulations (Marion and Williams, 1993). Furthermore, 80% of the campsites were "obvious" and 35% had lost nearly all of their vegetation cover and had bare soil

exposed in core areas. The results of these surveys indicate that visitors have not been sufficiently dispersed to avoid the creation of recognizable campsites or even the loss of organic litter and exposure of bare soil.

This **"No Action"** alternative would continue the management of SNP backcountry and wilderness under the existing guidelines and strategies of the 1984 BMP rather than "Limits of Acceptable Change" elements, quantifiable standards, or clearly defensible management actions. Specific mention is made in the Management Policies and in the Natural Resources Management Guideline (NPS-77) to the Limits of Acceptable Change (LAC) model as a planning framework for backcountry and wilderness planning efforts. Alternative A fails to meet NPS Management Policies which states that such plans "will establish indicators, standards, conditions, and thresholds above which management actions will be taken to reduce impacts." (Chapter 6:5) Planning models such as LAC are designed to facilitate the balancing of visitor use with the protection of park resources and impacts to other visitor and park users.

Moreover, Management Policies recognizes and authorizes the need for park zoning (as provided in the LAC model) and states that "prescriptive zoning will consider the capability of lands to support identified uses and will be used as a framework for specific planning and management decisions on use and development of the park." (Chapter 2:7) NPS-77 specifically recognizes and authorizes the use of management zoning in backcountry plans and states, "in developing backcountry use management plans,. . . managers may want to establish different recreational use zones ranging from areas with high concentrations of use to pristine areas with very little use." (Chapter 3:75)

Alternative A (No Action) was considered but rejected because it clearly does not meet the described policy requirements or recommendations.

The remaining **Alternatives B, C, and D** are based on the LAC planning framework. These alternatives include recreational zoning, or opportunity classes, but a spectrum of acceptable human impacts and modifications made to the environment to accomodate human recreation use are considered among the alternatives. Therefore, the primary difference between these alternatives is the amount of human use-related impacts on backcountry and wilderness resources considered acceptable and the type of wilderness experience opportunities that would be offered. These three alternatives provide management objectives for mitigation, creation, and restoration of backcountry resource and social conditions. Each of the three alternatives is based on the adoption and implementation of a BWMP. The BWMP incorporates the LAC planning process to meet backcountry and wilderness management policy directives. The plan would: 1) establish overall backcountry and wilderness management objectives; 2) designate five zoning classes (opportunity classes) that describe desired conditions for backcountry and wilderness areas; 3) describe measurable indicators of change for backcountry conditions and define specific quantitative standards and qualitative guidelines for backcountry and wilderness resources and character in each class; 4) zone the backcountry and wilderness into opportunity classes; 5) describe

monitoring programs for assessing change in backcountry conditions; 6) specify management actions that would potentially be implemented if standards are approached or exceeded: and 7) outline the process for implementing the plan.

Alternative B (Proposed Action): The proposed action is the adoption of the 1998 BWMP which has existed in draft form and has been continuously updated since 1994. The draft BWMP was developed by a parkwide interdivisional BWMP task group, received limited public participation in its development, and underwent a 60-day public review and comment period. Completion of the final draft BWMP required natural and cultural compliance review and approval, for which this EA is addressing in part.

The 1998 BWMP is based on a planning framework using concepts provided by "Limits of Acceptable Change" and "Visitor Impact Management" and employs a conceptual model called the "Recreational Opportunity Spectrum" which was adopted to apply to SNP backcountry and wilderness management issues. The BWMP also is provided as a backcountry "sourcebook" useful to interdisciplinary field staff. The resulting document is a comprehensive SNP backcountry management guide which describes not only the planning framework and recommended management actions, but addresses topics including historical SNP backcountry management, relationship to other Park planning documents, SNP backcountry facilities and recreational uses, wilderness awareness education, management of recreation impacts (ie. campsite and trails management strategies), budget and staffing assessment, and Park boundary issues. The BWMP addresses backcountry recreation management specifically and all issues affected by the Wilderness Act, This BWMP is intended to be used as a "working" document which shall be revised as frequently as necessary to reflect changing SNP backcountry conditions and management issues.

Six steps are used in the application of LAC to backcountry and wilderness management planning in the 1997 BWMP and these are provided at Appendix A.

The Proposed Action incorporates many of the management actions implemented by the 1984 BMP, however some actions are to be modified to reflect recreation ecology science conclusions, changing visitor use patterns, SNP backcountry and wilderness management experience since the BMP implementation, public input, changes to NPS directives and policies, and specific management objectives which have been determined for SNP backcountry and wilderness management. Examples of management actions modified from the 1984 BMP by the 1998 BWMP include the following:

1. Campsite Management Strategy: Whereas the present action (Alternative A) provides only dispersal camping and area closures, Alternative B campsite management strategy provides additional camping options of "established" campsites and designated campsites. Campers in lightly used areas are encouraged to disperse, or spread out, their use; campers in moderately-used areas are encouraged to use already existing, or established, campsites; and campers in high use or sensitive natural and cultural areas are required to use designated campsites or such areas may be closed to camping. This campsite strategy is designed to reduce impacts backcountry areas receiving different levels of use and therefore requiring

different campsite management strategies to minimize impacts. The LAC planning and management model, being incorporated into the 1998 BWMP, provides an overall decision making framework for the implementation of these camping options. Which options are emphasized would be primarily dependent upon ROS opportunity class designations.

2. Backcountry Camping Regulations: While some regulations apply to the entire backcountry, others are specific to each of the three camping options. Another significant change from Alternative A regulations is the replacement of "within sight" camping restrictions by distance restrictions. This is recommended because: 1) visibility assessments are inherently variable and dependent upon time of year and exact positioning and color of tents, 2) over half (1992/93 Campsite Inventory) of the existing campsites are illegal because they are within sight of formal trails, and 3) "within sight" restrictions are subjective and difficult to enforce. The establishment of a minimum 20 yard setback from formal trails for designated and established campsites should preserve hiker and camper solitude while permitting an expansion of the number of "legal" camping locations. Where convenient, distance restrictions are communicated in yards due to their close correspondence to the typical human stride, thus facilitating their application by visitors and enforcement by rangers.

Proposed backcountry camping regulations are presented in Appendix B.

3. Backcountry Camping Permit: The permit system will be revised and computerized to be more effective for data collection. It is likely that a permit fee will be attached to the permit system independent of BWMP actions in the **near** future; permit issuance will be streamlined and organized to accomodate a fee system. Effort will be made to minimize "self-registration" permitting during the traditionally busy visitor use seasons to provide better service to backcountry users and to better educate users during the permit issuing process and more strongly influence minimum-impact camping behavior.

4. Backcountry and Wilderness Education: Rather than rely on an outdated informational backcountry brochure and the backcountry camping permit issuance process in a limited effort to educate backcountry visitors as to expected behavior and regulations in the backcountry, an organized and integrated education outreach program, particularly in Leave No Trace skills, is the basis for public backcountry education. Education efforts are subject to evaluation to determine effectiveness.

5. Backcountry and Wilderness Inventory and Monitoring: Programs using scientific protocols and accuracy are designed and carried out to meet specific objectives described in the BWMP. Resource and social surveys are conducted on a routine basis to assess backcountry conditions against established standards to assure that management objectives are being met.

6. SNF' Wilderness Policy: The BWMP clarifies SNP Wilderness philosophy and addresses wilderness recreational use, "minimum requirement" policy, research and monitoring and resource management, and emergency operations.

The BWMP includes designation of five different opportunity classes ranging from a Primitive Wilderness class at the low-use end of the opportunity spectrum to a high-use Threshold class. A separate opportunity class is identified for the Appalachian Trail (AT) and associated structures. The opportunity classes are:

Primitive Wilderness (low use)
Primitive Non-wilderness (low use)
Semi-primitive Wilderness/Non-wilderness (moderate use)
Threshold Wilderness/Non-wilderness (high use)
Appalachian Trail Wilderness/Non-wilderness

These opportunity classes and their definitions are common to Alternatives B, C, and D. As examples of opportunity class definitions, only the Primitive Wilderness and Threshold classes are defined at Appendix C to describe the wide range of environmental, social, and managerial factors used to develop SNP backcountry and wilderness management objectives.

The allocation of opportunity classes for Alternative B was performed by SNP managers and the Geographic Information System (GIS) was used to generate opportunity class allocation maps for each of the three administrative districts. These maps are provided within the EA at Appendix E. Alternative A does not make use of opportunity classes or zoning to describe backcountry and wilderness management objectives and therefore no mapping is provided. The reallocation of opportunity classes used to compare and contrast the impacts of Alternatives C and D has not been mapped because these alternatives are described only as general concepts illustrating a range of opportunity class zoning possibilities.

Alternative C (More modified environment):

All elements described in Alternative B are common with **Alternative C** with the exception that the allocation of opportunity classes tend to the Threshold class, or high-use, end of the Recreational Opportunity Spectrum. Parkwide backcountry and wilderness management objectives are not nearly so balanced for environmental, social, and managerial conditions as those in Alternative B and the limits of acceptable change are generally set at standards strongly favoring high-use recreation conditions.

Alternative D (Less modified environment):

All elements described in Alternative B are common with **Alternative D** with the exception that the allocation of opportunity classes tend to the Primitive Wilderness/Non-wilderness class, or low-use, end of the Recreational Opportunity Spectrum. Parkwide backcountry and wilderness management objectives are not nearly so balanced for environmental, social, and managerial conditions as those in Alternative B and the limits of acceptable change are generally set at standards strongly favoring low-use recreation conditions.

Environmental Consequences Common to All Alternatives

The environmental consequences of the proposed action and alternatives are a direct result of human use of the backcountry and wilderness resource. This use is most often recreational, and is accompanied by activities to manage the use. Visitor use and park management activities result in direct and indirect impact to backcountry resources. A wide variety of ecological and human factors determines the scope and magnitude of this impact and affects our ability to successfully manage resource damage. Individual human activities in the backcountry generally do not result in significant changes to environmental conditions. However, recreational use by thousands of backcountry visitors (46,727 visitor nights in 1996 [1]) generally concentrated in a few popular backcountry areas and the activities associated with managing this use can result in impacts to vegetation, soils, wildlife, water quality and wilderness character that over a period of time or when considered cumulatively might be significant.

Compared to many other NPS backcountry environments, SNP is relatively resistant to long-term serious impact. A moderate climate with ample rainfall, good soils, and a long growing season produce vigorous and diverse plant communities with good regenerative qualities. However, the level of constant and intense impact has, in many cases, exceeded the ability of the resource to resist or recover from overuse. SNP managers must not rely on the regenerative qualities of the plant communities but should manage to avoid the impacts of overuse.

Brief Description of SNP Visitor Recreation Use Impacts to Resources:

Impacts on Vegetation

Visitor impact to vegetation is attributed to trampling, clearing of campsites, and vandalism. Cutting and/or gathering firewood is a problem particularly around shelters and huts with fireplaces. Backcountry campers who violate the “no fires” regulation intentionally cut and/or damage vegetation. Campfires in the backcountry may escape and cause widespread impact on vegetation. The severity of impact is related to intensity, frequency, and vegetation resistance to damage and resilience following damage. Impact from management actions is due primarily to road and trail construction and maintenance, fire suppression, emergency operations, and field research.

Impacts on Soils

Impact to soils is largely due to trampling, which causes the pulverization and loss of surface organic materials and the compaction and erosion of the underlying mineral soil. Soil compaction and erosion is a major concern in popular day use areas, such as those near scenic vistas and waterfalls. Soil compaction and erosion are also a concern in repeatedly-used backcountry campsites which are common along popular trails. These soil impacts also restrict the recovery of damaged vegetation, expose tree roots, reduce seed germination and survival, and increase surface water runoff.

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[1] The 1996 figure is an anomaly from the recent trend of increasing backcountry overnight use. Severe storm damage to many trail areas following Tropical Storm Fran in September 1996 greatly reduced backcountry visitor use through the typically busy autumn season. Backcountry visitor nights for 1995 was 58,283.

Areas denuded of understory vegetation from trampling and compaction are unsightly scars that detract significantly from aesthetic and wilderness values. Particularly noticeable are trail switchbacks "shortcut" by hikers. Vegetation and topsoil are lost on these characteristically steep slopes. Illegal use of all-terrain vehicles are especially damaging to the trail surface by loosening rocks, destroying erosion control structures, and otherwise disturbing the soil surface.

Soil surface disturbance is primarily associated with backcountry roads and trails and the construction of fire lines during wildfire suppression activities. Thousands of tons of soil can be lost from park roads and trails annually unless proper design and maintenance standards are utilized. Presently, some trails are poorly designed and maintained and erosion is recognized as a significant problem.

Impacts on Wildlife

Although park wildlife is both abundant and diverse, few species are directly affected by human activities. Those species that are adversely affected by human presence during mating, denning, or birthing seasons, however, present significant management concerns.

The native brook trout population in park streams is directly impacted by both legal recreational fishing and illegal fish poaching activities. Trail and campsite erosion may impact aquatic life through excessive siltation and poor sanitation practices, although this has not been documented. Documented fish vulnerability to stream acidification from air pollution may increase fish sensitivity to other human-induced disturbances.

The eastern black bear, both individually and as a total population, is affected by human activities within the park. Human food sources made available by backcountry campers and day hikers may lead to changes in bear feeding patterns and habitat utilization. Bear-human conflicts have been a management problem in the recent past because conditioned bears would forage for visitors' food at backcountry camps. Incidents have been reduced through educational efforts and regulations designed to promote proper food storage techniques. Human activity during peak use periods directly affect the daily movements of bears within their home ranges. Legal hunting outside the Park and illegal poaching within the park also directly impact the population through direct reduction.

White-tailed deer are frequently observed to be conditioned to human presence, probably due to intentional illegal feeding by humans. Exceptionally tame deer which approach visitors for food are common in backcountry areas which receive heavy use or in frontcountry areas where deer are routinely fed. Otherwise, human impacts on deer are probably similar to those on the bear population.

The effects of backcountry visitation on other wildlife species in the park are not known at this time,

Impacts on Air and Water Quality

Impacts on air quality by backcountry users are negligible. The protection of stream water quality within the park is critical for several reasons. Abundant water sources provide domestic water for park operations and many nearby communities. Springs and streams are relied upon by backcountry hikers and campers for their daily water needs. Stream ecosystems are directly affected by any changes in the physical or chemical properties of the water. The management and disposal of human waste to prevent stream contamination is an ongoing concern.

Impacts on Cultural Resources

Cultural and archeological sites in the backcountry have been adversely impacted by visitor use. Sites which are highly visible, close to trails, or near the park boundary may be subject to vandalism or inadvertent disturbance, and campers damage structural remains by camping within masonry and log ruins and by digging pits within sensitive archeological sites.

Impacts on Wilderness and Solitude

The wilderness experience and visitor solitude are also affected by visitor use. The quality of the visitor experience may decline to an unacceptable level as public access to the park's backcountry rises. Visitors tend to have differing personal beliefs about standards of crowding; factors such as numbers of people, noise, behavior, litter, group sizes, and carrying capacity needs to be evaluated and managed so that visitor opportunities are maintained to reflect diversity in visitor use densities. Wilderness character should place high priority on visitor solitude.

Impacts of Alternatives

General Elements

The BWMP deals primarily with the management of human recreation impacts upon the park's backcountry natural and cultural resources and the quality of the backcountry and wilderness experience. Backcountry and wilderness use and impact issues which are addressed in the BWMP include campsite management, trail system management, backcountry access, recreation facilities, backcountry visitor safety, and recreational use conflict. Visitation to the SNP backcountry and wilderness will undoubtedly continue and likely increase; management action (or failure to act) to address these issues requires that some change occur to the resource or to social conditions. The BWMP provides overall guidelines and a planning framework for managing backcountry and wilderness; few specific actions are proposed. The Environmental Assessment is programmatic in scope and quantification of environmental consequences is therefore difficult and speculative.

Critical Elements

Critical elements are the subject of legislation (40 CFR 1508.25) covered by the Executive Orders or NPS regulations. Implementation of any of the viable Alternatives **B, C** or **D** is not expected to adversely affect the listed resources:

Threatened or Endangered Species
Wetlands/Riparian Zones
Floodplains
Cultural/Historic Resources
Air Quality
Water Quality
American Indian Religious Uses
Farmlands, Prime/Unique
Handicapped Access
Scenic Values
Wastes, Hazardous/Solid
Wild and Scenic Rivers

Each of the alternatives requires that the impacts of any action, potentially affecting the above elements, will be analyzed on a project-by-project basis. All projects will fully comply with appropriate laws and regulations including the National Environmental Policy Act, Endangered Species Act, Executive Orders relating to wetlands and floodplains, and section 106 of the National Historic Preservation Act.

Comparison of Impacts of the Alternatives

A comparison of the resource, social, and managerial impacts of Alternatives **A, B, C,** and **D** follows. Alternatives C and D are based on Alternative B, the **Proposed Action,** and analysis of anticipated environmental impacts and social conditions relies on differing allocations of opportunity classes between the proposed action and alternatives C and **D.**

The impacts of each of the four alternatives are examined and compared in the following format:

I. Resource Conditions
A. Impacts on vegetation and soils
B. Impacts on wildlife

II. Social Conditions
A. Impacts on wilderness and solitude
B. Impacts on visitor activities

III. Managerial Conditions
A. Impacts on wilderness character

Alternative A (No Action)

I. Resource Conditions

A. Impacts on vegetation and soils:

Alternative **A** does not provide standards for conditions of these elements nor does it provide a system for monitoring impacts or conditions. The campsite dispersal strategy has not had the desired effect to minimize impacts to vegetation and soils. Numerous established campsites (700 campsites parkwide by recent survey) have continued to exist or have been created, even in "low-use" backcountry areas. These impacts are not acceptable with a "pure" dispersal system which by design should result in no established campsites and minimal impact to vegetation and soil. Research indicates, however, that a campsite dispersal strategy, particularly in high-use areas, actually perpetuates more impact to vegetation than managed concentration of use. Impacts to vegetation and soils can be expected to increase with limited management ability to minimize impacts as backcountry overnight visitation increases.

B. Impacts on wildlife:

Alternative **A** does not provide direction for backcountry zoning so that some areas of backcountry may emphasize natural processes and reduction of visitor access to preserve wildlife patterns. Improved visitor access to low-use backcountry areas via new trail construction, trailhead development, etc. to accomodate increased visitor use may have the effect of disrupting wildlife behavior in formerly remote areas.

II. Social Conditions

A. Impacts on wilderness and solitude:

Alternative **A** does not provide direction for backcountry zoning so that some backcountry areas are restricted from increased trail access and trailhead development to preserve wilderness quality and opportunities for solitude, as increased development in yet other areas is acceptable to accomodate or encourage increased visitor use. Therefore, indiscriminate and unplanned development and improved access may impact wilderness quality in some backcountry areas.

B. Impacts on visitor activities:

Impacts may vary with Alternative **A** as reactive management decisions are made to mitigate visitor recreational use problems without the benefit of backcountry zoning or specific management objectives. Visitors will continue to be required to camp in a "dispersed" fashion throughout the backcountry, inconsistent with eastern U.S. minimum impact techniques and often difficult for visitors to achieve within existing backcountry regulations.

III. Managerial Conditions

A. Impacts on wilderness character:

Impacts may vary with Alternative **A** as reactive management decisions are made to mitigate visitor recreational use problems without the benefit of backcountry zoning or specific management objectives. The enforcement of existing backcountry regulations by Park Rangers to achieve management goals of minimizing "unacceptable conditions" will continue to be a high profile, intensive program and nearly impossible task since these conditions are not clearly defined and existing parkwide dispersal camping strategy defies recreation ecology research findings and visitor campsite selection behavior.

Alternative B (Proposed Action)

I. Resource Conditions

A. Impacts on vegetation and soils:

Alternative **B** provides a balance of opportunity class designations in the backcountry environment so that varying levels of recreation use are managed for corresponding standards of resource protection and visitor use and enjoyment as determined by the management objectives. Limits of acceptable change to vegetation and soil conditions are variable between the opportunity classes.

B. Impacts on wildlife:

Alternative **B** provides a balance of opportunity class designations and therefore impacts on wildlife is variable between the opportunity classes.

II. Social Conditions

A. Impacts on wilderness and solitude:

Alternative **B** provides a balance of backcountry/wilderness places which provide opportunities for solitude while also providing opportunities for those backcountry visitors more interested in popular destination points (ie. scenic viewpoints, waterfalls, rock scrambles) than in a solitude experience.

B. Impacts on visitor activities:

Although some backcountry visitor activities such as horse and mountain bike use are necessarily restricted throughout all opportunity classes for various management purposes, Alternative **B** provides for a balanced mix of backcountry-dependent visitor activities.

Campsite management strategies will conform more to visitor campsite selection behavior while simultaneously reducing degradation to vegetation and soil conditions.

III. Managerial Conditions

A. Impacts on wilderness character:

Wilderness management under Alternative **B** is generally consistent with strict interpretation of the Wilderness Act. The use of chainsaws, helicopters, and other mechanical equipment in Wilderness is strictly limited, but excepted as necessary and allowed for by the Wilderness Act for emergency conditions. A very few areas of SNP designated Wilderness are included in Threshold (ie. high-use Old Rag area) or Semi-primitive (ie. a few moderate-use trail corridors in Wilderness) opportunity classes which allow for some trail maintenance standards, social conditions, use of mechanical equipment, campsite management strategy, signing, facilities, ranger presence, and other managerial elements that might otherwise be considered to be in conflict with wilderness quality. Wilderness character is infrequently compromised by visitor recreation use, as possible and common by eastern U.S. norms for wilderness. In all of the alternatives, trail maintenance standards and trailwork priorities are reduced in Primitive wilderness; no new trails or facilities are to be developed in any designated SNP wilderness. Opportunities for solitude in most SNP wilderness is outstanding.

Alternative A relies on more light-handed measures, especially outreach and in-park education programs such as the national Leave No Trace program, to educate the public in minimum impact behavior as opposed to focusing on a heavy-handed, intensive regulations enforcement program. In the future, it may be expected that as the public outdoor ethics and practices in minimum impact techniques increases, management presence in primitive wilderness areas may be reduced.

Alternative C (More modified environment)

I. Resource Conditions

A. impacts on vegetation and soils:

Alternative C, that alternative which favors high-use recreation conditions (nearly ail of the backcountry tends to the Threshold opportunity class), allows the most flexibility in modification of the backcountry environment to provide for recreation use. This alternative encourages campsite management strategies, backcountry access, and trail system development and conditions considered acceptable within high-use standards. Greater management tolerance for such conditions and levels of use clearly increases the potential for trampling of vegetation and soils, clearing of campsites, vandalism, trail construction and maintenance, and resulting soil compaction and erosion. Regulations intended to minimize visitor impacts to the resource might be relaxed to reduce management constraints on some backcountry visitor activities, perhaps at the expense of vegetation and

soil conditions.

B. Impacts on wildlife:

Alternarivc C allows a greater human presence in the backcountry which adversely affects those species which are seasonally sensitive to human activities. Improved access to backcountry might increase levels of recreational fishing and impact native brook trout populations. Trail and campsite erosion which are acceptable at higher levels in Alternative C may impact aquatic life through siltation and sanitation problems more so than other alternatives. Black bears would likely be affected by increased human activities; human food sources might be made more available by backcountry campers and day hikers which lead to changes in bear feeding habits and habitat utilization. The potential for increased human activity may affect daily movement of bears and other wildlife. Bear and white-tailed deer might be expected to become more conditioned to human presence.

II. Social Conditions

A. Impacts on wilderness and solitude:

Alternative C provides fewer opportunities for those backcountry visitors interested in a solitude experience. Accessibility to backcountry/wilderness is enhanced by high trail maintenance standards and the associated increase in human presence and activity may reduce opportunities for solitude.

B. Impacts on visitor activities:

Alternative C provides better opportunity for backcountry visitor activities as good accessibility to backcountry areas is a primary management consideration. Emphasis on backcountry visitor recreation use might encourage expansion of some visitor activities into more remote backcountry areas. Conflicting backcountry uses on shared trails and other backcountry areas would likely increase as levels and variety of visitor activities change. Opportunity for solitude for hikers and backpackers might be reduced.

III. Managerial Conditions

A. Impacts on wilderness character:

Alternative C provides for a more anthropocentric management interpretation of the Wilderness Act. General wilderness character is that of Threshold Wilderness where the legal requirements and intent of the Wilderness Act are met as possible, but facilities and access are less restricted for the use and enjoyment of the public. Opportunities for solitude are less likely to be found and perhaps only during certain low-use periods of the year or when travelling off-trail in some of the more popular areas. Trails are maintained at a high-use standard. Signing other than directional signs is more prevalent.

Alternative D (Less modified environment)

I. Resource Conditions

A. Impacts on vegetation and soils:

Alternative **D** provides for the most protection of vegetation and soil as low-use recreation backcountry environmental conditions are strongly favored (nearly all of the backcountry tends to the Primitive opportunity class), perhaps at the expense of minimized and restricted visitor use and enjoyment.

B. Impacts on wildlife:

Alternative **D** provides for the most protection of wildlife populations and conditions as human recreation use of the backcountry is minimized. Nearly all of the backcountry is managed as natural wildlife habitat sporadically influenced by human activity on trails and at other backcountry facilities. The opportunity for existance of wildlife in truly "wild" conditions is enhanced.

II. Social Conditions

A. Impacts on wilderness and solitude:

Alternative **D** reduces backcountry/wilderness accessibility to many visitors with a minimized trail system and is the better alternative to provide a solitude experience. However, this experience would be limited to a few hardy visitors who have the skills, abilities, and time to face the difficult challenge of travel through a largely trailless, rugged, and very wild land area.

B. Impacts on visitor activities:

Alternative **D** is more restrictive in the level and types of visitor activities in the backcountry primarily due to visitor access limitations.

III. Managerial Conditions

A. Impacts on wilderness character:

Wilderness character under Alternative **D** differs little from Alternative **B,** except that all designated SNP wilderness is included in the Primitive Wilderness opportunity class. Therefore, little management flexibility is afforded to manage historically high- to moderate-use areas such as Old Rag trails and a few other Park trail corridors. Attempting to manage those few areas for Primitive Wilderness management objectives would likely improve the "wilderness character" of those areas, but conflict would likely occur in significant reduction

of visitor use and downgraded facilities and access to achieve "pure" wilderness quality and may be unacceptable to the public.

Discussion of Proposed Action as Preferred Alternative

Alternative **A (No Action),** the 1984 BMP and present action, was considered and rejected early in this EA discussion because it does not meet NPS policy requirements or recommendations. Alternative **B,** the adoption of the 1998 draft BWMP, is identified as the **Proposed Action** and is selected as the **Preferred Alternative.** Alternatives C and **D** are based on Alternative **B.** Alternative C has all of the elements of Alternative **B** with the exception that the allocation of opportunity classes tend to the Threshold class, or high-use, end of the Recreation Opportunity Spectrum in determining backcountry management objectives. Alternative **D** also has all of the elements of Alternative B with the exception that the allocation of opportunity classes tend to the Primitive Wilderness/Non-wilderness class, or low-use, end of the Recreation Opportunity Spectrum in determining backcountry management objectives.

Alternative **B** is selected as the Preferred Alternative because of its balanced employment of the various opportunity classes to meet the NPS dual mandate to protect Park resources while simultaneously providing for visitor use and enjoyment. Upon comparison of the environmental and social impacts of the alternatives, Alternative C clearly favors visitor use and activities; however, this planning has greater potential for adverse impacts on vegetation and soil and on wildlife than the other alternatives. Alternative C may also have adverse impacts on solitude and wilderness character as the backcountry is managed with emphasis on human recreation use and activities. Alternative **D** clearly favors resource protection and provides the best conditions for protection of vegetation and soil and wildlife. This alternative also provides the more outstanding opportunities for solitude and wilderness character. Alternative **D** appears to have much more desirable resource and social condition qualities than Alternative C. However, Alternative **D** fails to provide recreation opportunities for a broader spectrum of backcountry visitor use at SNP and therefore does not clearly meet the purpose and need to provide for visitor use and enjoyment of backcountry resources as Alternative **B** does.

APPENDIX A

The following six steps are used in the application of Limits of Acceptable Change to backcountry and wilderness planning in the 1998 BWMP:

1. Determine prescriptive management objectives:
Specific physical, biological, and social conditions that park management seeks to create, restore, or maintain within areas of the SNP backcountry are described. "Opportunity classes" are defined; collective narrative descriptions of resource, social, and managerial conditions for each opportunity class constitute the management objectives. Opportunity class designates the availability of a particular quality or kind of experience that is appropriate to the conditions (Hendee et al. 1990). The "Recreational Opportunity Spectrum" (ROS) model, a highly developed recreation classification system, is used to identify opportunity classes and corresponding management objectives (Manning 1986).

2. Describe indicators of change:
Biophysical and social "indicators" of change are identified and described to provide evaluation of the specified management objectives. The ROS model was used as a reference to develop the indicators.

3. Formulate standards:
The indicator "standards" are subjective value judgements by managers (with public input) to specify the "limits of acceptable change, " establishing a measurable reference point to which future conditions can be compared. The standards are derived from the management objectives and are quantifiable.

Social and resource inventories are necessary to characterize resource and social conditions. A survey of Shenandoah's backcountry visitors is planned to collect a variety of sociological information. In the interim, backcountry visitor social surveys conducted in the 1970's have been relied upon. Current resource baseline conditions for backcountry campsites were documented in 1992. Standards will need to be revised as new research surveys are completed and analyzed. Standards will remain flexible so that management "limits of acceptable change" will be realistic. The limits define the boundary between acceptable and unacceptable conditions; standards represent the upper limits which management will permit. However, management will strive to keep conditions from deteriorating to this highest acceptable limit. Where possible, it is the intention of SNP to identify the rate of change not to be exceeded in addition to specific standards. In some instances management actions may be taken in backcountry areas as conditions approach, but may not have reached, the established standards. The ROS model was used as a reference in developing the current standards.

4. Monitor conditions:
Standardized monitoring programs are being developed and will be implemented to assess current conditions with respect to each indicator. These programs will include sociological surveys, impacted campsite monitoring, and trail condition monitoring.

5. Compare bio-physical and sociological conditions to standards:
Monitoring data will periodically be compared with standards. Monitoring continues and changes occurring can be evaluated and appropriate preventative management actions will be taken. If the standards are exceeded, more drastic management actions might be necessary. The underlying cause(s) of the problem must be identified and appropriate corrective actions will be selected.

6. Implement management action:
Once actions are selected, they will be implemented. Continued monitoring will be essential to determine the relative effectiveness and success of the implemented actions. An ongoing cycle including steps 4 through 6 will therefore provide the basis for'the management of backcountry recreational use in SNP. LAC supports reflection and revision of management objectives (step 1) as conditions warrant.

APPENDIX B Backcountry Camping Regulations

NOTE: Enforceable regulation statements are in **bold.**

Parkwide Backcountry Camping Regulations

1. **Backcountry camping permits are required.**
2. **Group size is limited to 10 people.**
3. **Campfires are prohibited** (except at fireplaces at huts and shelters).
4. **Store food so wildlife cannot have access to it. Hang food in a tree at least 10 feet above the ground and at least 4 feet from the tree trunk.**
5. Protect water resources. **Camp at least 10 yards from any stream.**
6. Protect cultural resources. **Camp at least 50 yards from standing building ruins such as stone foundations, chimneys, log walls, etc.**
7. Provide for solitude. **Camp at least 50 yards from another camping party or "no camping" post.**
8. **Camp at least 50 yards from a hut, shelter, or cabin.** The park limits camping at huts to long term hikers (trip duration of 2+ nights in park) and one night stay. Shelters are for day use only.
9. **Camp at least 1/4 mile from Skyline Drive and park boundary. Camp at least 1/2 mile from a park facility such as campgrounds, picnic areas, visitor centers, lodges, wayside restaurants, and Camp Hoover.**
10. Use good toilet habits. **Relieve yourself at least 20 yards from streams, trails, or roads. Bury solid human waste in a hole at least three (3) inches deep.**
11. **Pets must be leashed at all times. Pets are not permitted on some trails.**
12. **Carry out all trash.** "Pack it in. Pack it out."

Established Campsite Regulations (high & moderate use areas)

1. **Camp** in an existing campsite **at least 20 yards from a park trail.**
2. **No more than two-(2) consecutive nights in the same location.**

Dispersed Campsite Regulations (low use areas)

1. **Camp** in an undisturbed area **at least 50 yards from a park trail.**
2. **No more than one (1) night in a single location,** defined as within 50 yards from the previous site.

Designated Campsite Regulations

1. **Camp and cook in designated site.**
2. **No more than two (2) consecutive nights at a single campsite.**

Designated campsites are found in the following areas: currently none.

No Camping Zones (Day use only)

1. Four areas designated as outstanding natural areas are closed to camping: **Old** Rag Mtn. above 2800', Summit of Hawksbill **Mtn.**, White Oak Canyon between upper falls and Cedar Run Link Trail, and Limberlost Trail area.

APPENDIX C

As examples of opportunity class definitions, the Primitive Wilderness and Threshold classes are defined here to describe the wide range of environmental, social, and managerial factors used to develop SNP backcountry and wilderness management objectives:

Primitive Wilderness (low use)

A. Resource Setting

The primitive wilderness setting contains much of the park's designated wilderness areas. The area is characterized by a largely recovered natural environment with lightly maintained or unmaintained trails. Concentration of users is very low, and evidence of other area users is minimal with the exception of existing trails and historical or cultural resources. Ecological and natural processes are not measurably affected by the actions of users. Environmental impacts (human) off trails are minimal and restricted to minor temporary loss of vegetation where camping occurs. These areas typically recover on an annual basis, and impacts are subtle in nature and generally not apparent to most visitors.

B. Social Setting

High to outstanding opportunities for solitude and isolation exist while traveling off trails, and the probability of encounters with other users or management personnel along trails is generally infrequent, particularly with greater distances from Skyline Drive or the boundary. The user has outstanding opportunities to travel cross-country utilizing a maximum degree of minimum impact outdoor skills. The environment offers a high degree of challenge, self-reliance, and risk. Inter-party contacts will be very few while traveling and low to non-existent at campsites.

C. Managerial Setting

Management strongly emphasizes sustaining and enhancing the natural ecosystem and promoting and perpetuating the wilderness character and values associated with wilderness designation. Backcountry camping permits are required. Necessary rules and regulations will be communicated to visitors outside the area such as at permit-issuing stations or trailheads.

Direct on-site management of visitors is seldom used. Formal and informal user education programs will be initiated to inform users about what to expect and how to use the area for optimum benefits to all. Patrols and monitoring of conditions by appropriate park personnel will be conducted only as necessary to achieve management objectives. Existing trails will be minimally maintained to accommodate light and infrequent travel. New trails will not be constructed. The prevention of resource damage dictates the frequency and specifications of treadwork and drives trail maintenance standards. The objectives for trail maintenance are further described in BWMP chapter 8. Signs may be present for resource protection or for trail direction only.

No administrative structures will be provided or permitted. Motorized use within the area is not permitted except under emergency conditions or to meet administrative requirements and then only on a case by case basis.

Threshold Wilderness and Non-wilderness (high use)

A. Resource Setting

The Threshold opportunity class is characterized by a predominantly natural and generally recovered environment. Natural conditions in many locations may be substantially affected by the action of users. Environmental impacts may be significant in areas along major trails and travel routes and near major entry points. Impacts often persist from year to year, and there may be moderate loss of vegetation and soil at some sites. Impacts are readily apparent to most visitors.

B. Social Setting

Opportunities for exploring and experiencing isolation from the sights and sound of man are moderate to low. The probability of encountering or hearing other area users is moderate to high. The user has the opportunity for a high degree of interaction with the natural environment, often with low or moderate challenge and risk. Contacts with other users may be relatively high, both on the trail and at campsites. It may be common during peak use periods for some parties to come within sight or sound of each other while at campsites. Motorized vehicles may be encountered while traveling along an administrative road in non-wilderness areas.

C. Managerial Setting

Management will be oriented to sustaining and restoring the natural ecosystem and cultural resources. On-site management will involve routine visitor contact. Backcountry camping permits are required. Necessary rules and regulations will generally be communicated to visitors outside the area through trail head signing, printed materials, and contacts with rangers. Patrols by park personnel will concentrate on contacting visitors. Information concerning minimum impact, wilderness management, user conflicts, fire prevention, and other pertinent subjects will be presented. Formal and informal education programs will inform users about area conditions and how to use the area to minimize impacts to the resource and to other people.

Direct site management may be used to limit impacts and meet management objectives. Public use restriction and enforcement actions will be initiated when necessary. Signs will be used for resource protection, safety messages, directional purposes, and in non-wilderness areas may be used to present educational information. On nature trails, guide booklets and exhibits may be used. Trails will normally be constructed, maintained, and managed to accommodate seasonally heavy use. The primary objectives of trail maintenance are described in chapter 8. Existing administrative roads will be allowed if needed in non-wilderness areas, but no new roads will be built and maintenance is limited to keeping roads clear and prevention of damage to resources. Administrative structures will be limited to existing cabins or shelters in non-wilderness areas, but no new structures will be built. Other structures such as horse hitching racks, toilets, and bridges may be provided only in exceptional cases. Permitted structures will exist only for resource protection. Motorized equipment may be used by park personnel or other authorized trail maintenance personnel for purposes of maintaining trails in non-wilderness areas or for ecological monitoring. Motorized vehicles may be used on designated administrative roads by authorized persons only in areas not designated as wilderness. Motorized use within wilderness is not permitted except under emergency conditions or to meet administrative requirements and then only on a case by case basis as described in BWMP chapter 5.

APPENDIX D

Summary of Resource and Social Setting Components for Opportunity Classes

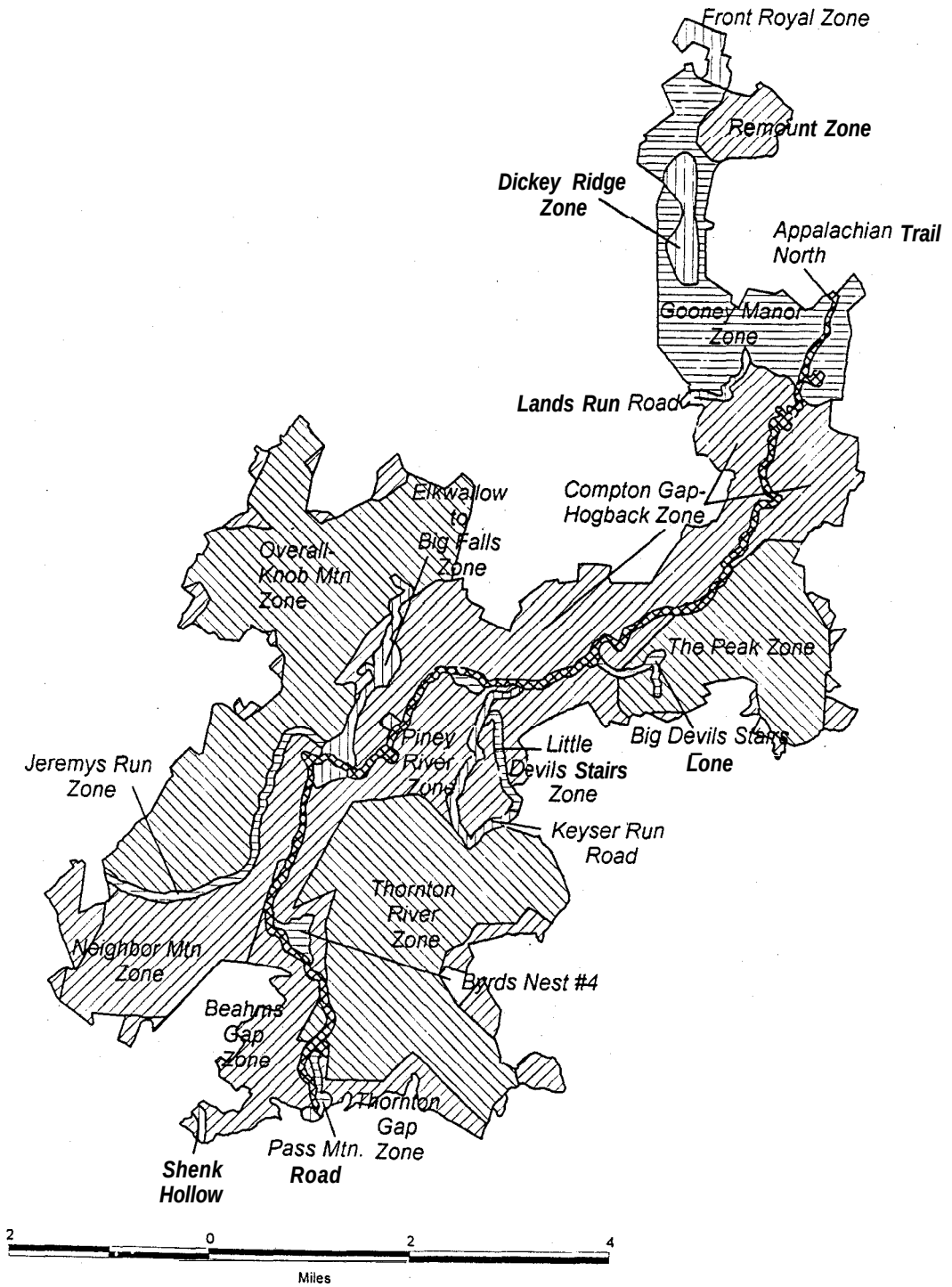
COMPONENT	PRIMITIVE WILDERNESS (low use)	PRIMITIVE NON-WILDERNESS (low use)	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS [moderate use)	THRESHOLD WILDERNESS/ NON-WILDERNESS (high use)	APPALACHIAN TRAIL WILDERNESS/ NON-WILDERNESS
Resource Setting: General Description	Regenerated natural environment		Essentially regenerated natural environment	Predominantly regenerated natural environment	
1. Ecological couditious (off trails)	Not measurably affected by the action of users	Minimally affected by the action of users	Moderately affected by the action of users	Many sites substantially affected by action of users (campsites, social trails, viewpoints)	Moderately affected by action of users
2. Prevalence of change due to recreation (off trails)	Minor disturbance to vegetation where camping occurs which usually recovers annually.		Moderate loss of vegetation where camping occurs and along some off-trail travel routes. Impacts in some areas persist annually.	Moderate loss of vegetation and soil on human-impacted sites and off-trail travel routes. Impacts often persist annually.	Moderate loss of vegetation where camping occurs. Impacts may persist annually.
3. Visibility of impacts (off trails)	Not apparent to most visitors	Apparent to a low numbers of visitors	Apparent to a moderate number of visitors	Impacts are readily apparent to most visitors	Apparent to a moderate number of visitors
Social Setting: General Description	High to outstanding opportunities for isolation and solitude		Moderate opportunities for isolation and solitude	Low to moderate opportunities for isolation and solitude.	
1. General level of encounters	Low to infrequent		Moderate	Moderate to high. Groups are common.	Frequent to Very Frequent
2. Degree of challenge and risk	High		Moderate to Low	Low to moderate	Low
3. Interparty contacts while traveling	Few		Moderately frequent	Numerous. May have to stop to let others pass.	Few to numerous.
4. Interparty contacts at campsite	Low to non-existent		Moderately frequent	Common	Common at facilities

Summary of Managerial Setting Components for Opportunity Classes

COMPONENT	PRIMITIVE WILDERNESS (low use)	PRIMITIVE NON-WILDERNESS (low use)	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS (moderate use)	THRESHOLD WILDERNESS/ NON-WILDERNESS (high use)	APPALACHIAN TRAIL WILDERNESS/ NON-WILDERNESS
Managerial Setting: General Description	Strongly emphasize sustaining and enhancing natural ecosystem with no development	Strongly emphasize sustaining and enhancing natural ecosystem	Emphasize sustaining and enhancing the natural ecosystem with limited development		
1. contact with park staff	Infrequent	Minimum	Routine		
2. Rules and regulations	Will be communicated to visitors primarily outside of the backcountry at trailheads and ranger stations		When necessary, on-site enforcement and communications of rules and regulations will be conducted through regularly scheduled patrols		Primarily communicated at contact stations and huts
3. Formal and informal user education programs	Will be initiated to inform users about minimum impact use and what to expect for optimum benefit for all.				
4. Direct site management	Very limited--i.e plant large rocks to close site if impact exceeds standards	Very limited	Limited actions only as necessary to meet standards or objectives	Designated sites, closures, site hardening etc. as necessary to meet standards or objectives.	Maintain huts; otherwise limited actions to meet objectives or standards
5. Backcountry camping permits required	Required in all opportunity classes				
6. Level of trail maintenance	Managed to accommodate light use. Unmaintained trails may exist. No new trail construction.	Managed to accommodate light use. Unmaintained trails may exist. Limited construction of new trails.	Managed to accommodate moderate use and prevent resource damage	Managed to accommodate heavy use.	Maintained to high standards to accommodate heavy use.
7. Type of trail use	Foot/X-country ski. Horses on designated trails only.				Foot/X-Country Ski
8. Presence of administrative structures (cabins, huts, towers)	No non-historic structures allowed.		No new structures to be built.		Huts exist every 10-15 miles with several cabins and maintenance huts in non-wilderness. No new structures to be built.

COMPONENT	PRIMITIVE WILDERNESS (low use)	PRIMITIVE NON-WILDERNESS (low use)	SEMI-PRIMITIVE WILDERNESS/ NON-WILDERNESS (moderate use)	THRESHOLD WILDERNESS/ NON-WILDERNESS (high use)	APPALACHIAN TRAIL WILDERNESS/ NON-WILDERNESS
9. Presence of other structures (toilets, hitchracks, bridges,etc.)	None allowed		A few permitted for resource protection or visitor safety only.		
10. Presence of signs	Resource Protection, directional, trailhead signs; minimal signage	Resource Protection, directional, trailhead, safety signs		Resource Protection, directional, trailhead, safety and interpretive signs	Resource Protection, directional, trailhead, and safety signs
11. Motorized vehicles and equipment	None allowed, except under emergency conditions or to meet administrative requirements as authorized by superintendent	None allowed, except for motorized equipment use for trail maintenance and resource monitoring activities	Vehicles allowed on existing tire roads by authorized persons only in NON-WILDERNESS AREAS ONLY. Motorized equipment allowed in NON-WILDERNESS AREAS only, except for emergency conditions or to meet administrative requirements in wilderness as approved on a case by case basis by the superintendent.		No motor vehicles allowed except where trail crosses admin. road. Motorized equipment is allowed in NON-WILDERNESS only, except as authorized by superintendent in wilderness.
12. Administrative roads	None allowed		Only necessary and existing admin. roads in NON-WILDERNESS areas. No new roads to be constructed.		None allowed except where trail crosses existing road.
13. Utility line corridors	None allowed	As exists	As exists in NON-WILDERNESS areas		As exists

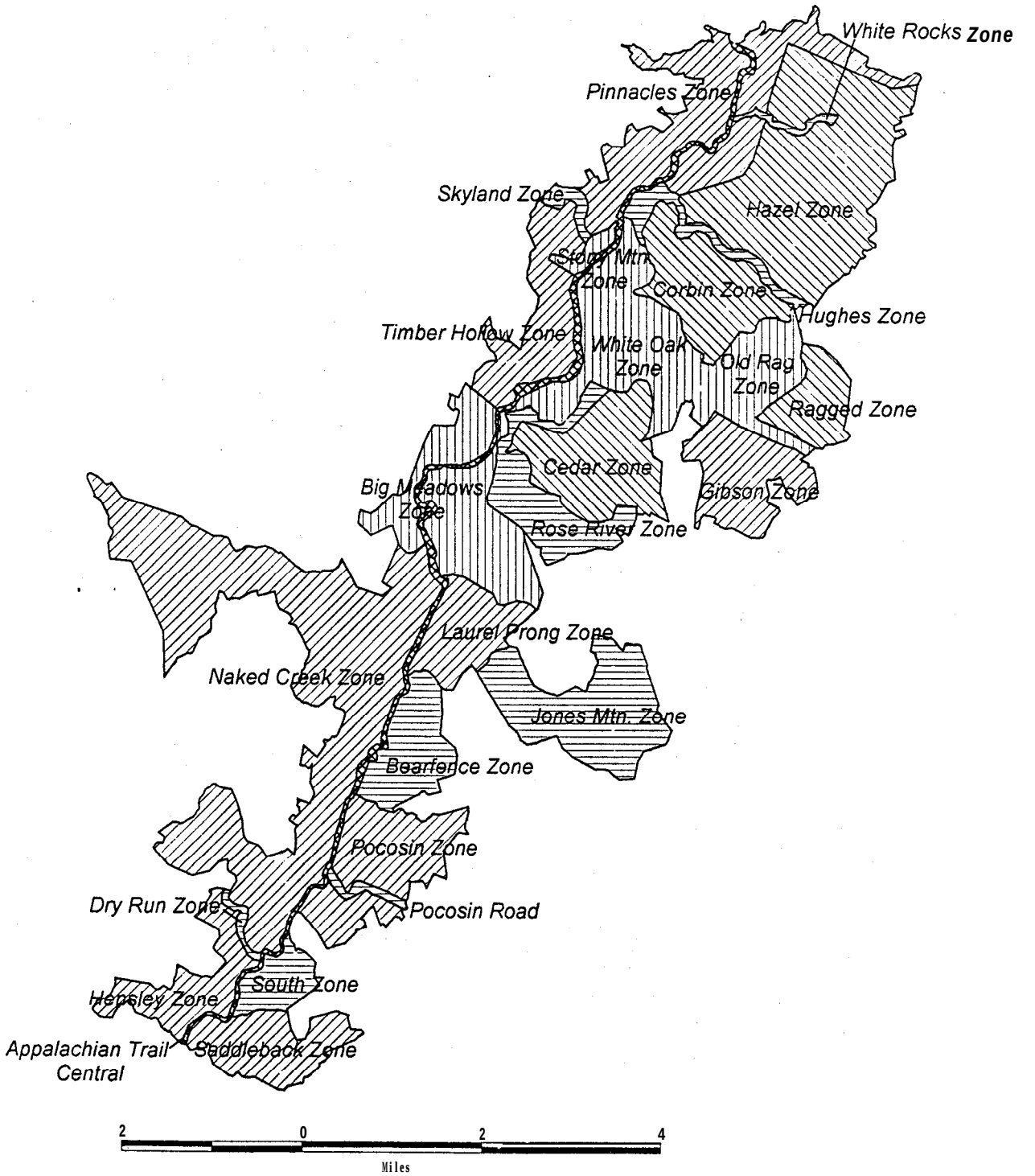
Shenandoah National Park
North District
Recreational Opportunity Classes.



Recreational Opportunity Class

- Appalachian Trail Wilderness and Non-wilderness
- Primitive Non-wilderness
- Primitive Wilderness
- Semi-primitive Wilderness and Non-wilderness
- Threshold Wilderness and Non-wilderness

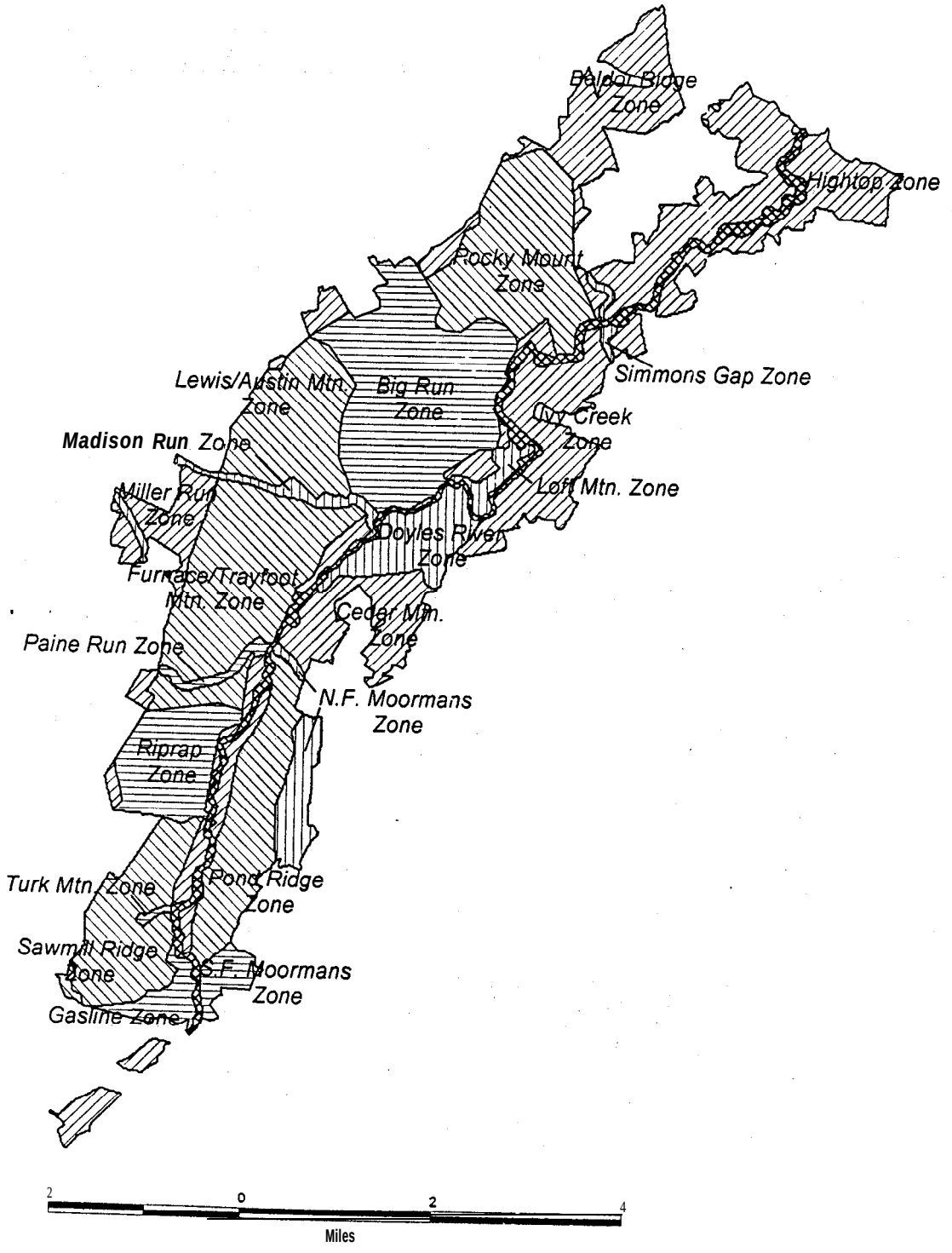
Shenandoah National Park
Central District
Recreational Opportunity Classes



Recreational Opportunity Class

- ***Appalachian Trail Wilderness and Non-wilderness***
- ***Primitive Non-wilderness***
- ***Primitive wilderness***
- ***Semi-primitive Wilderness end Non-wilderness***
- ***Threshold Wilderness and Non-wilderness***

Shenandoah National Park
South District
Recreational Opportunity Classes



Recreational Opportunity Class

- Appalachian Trail Wilderness and Non-wilderness
- Primitive Non-wilderness
- Primitive Wilderness
- Semi-primitive Wilderness and Non-wilderness
- Threshold Wilderness and Non-wilderness

APPENDIX F

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16.2 Future Actions

The following is a compilation of "future actions" to be taken to fully implement the BWMP.

Chapter 2, DESCRIPTION OF THE BACKCOUNTRY RESOURCE

2.4 Natural and Cultural Aspects of Resource

A. Review and incorporate natural heritage resource area information and recommendations from the Natural Heritage Resources report into the BWMP.

B. Incorporate future archeological assessment and overview information into the BWMP.

Chapter 4, BACKCOUNTRY/WILDERNESS MANAGEMENT FRAMEWORK

4.2 Management Objectives

A. Establish or refine resource and social indicators and standards.

B. Determine initial management actions to be taken to meet the standards established for opportunity classes.

4.3 Mapping of Opportunity Class "Zones"

A. Review, revise opportunity class maps to improve consistency in perceived "levels of use" between the districts.

Chapter 6, FACILITIES

6.1 Shelters

A. Evaluate the need for continued maintenance of the administrative roads leading to shelters. Maintain abandoned roads as trails (assure rehab/erosion control of closed or abandoned roads).

B. Evaluate removal of existing toilets, fireplaces, and protected water supplies at shelters. Schedule and perform removal of facilities as deemed appropriate.

'6.2 PATC Cabins

A. Continue to monitor the supply of downed firewood and work with PATC to develop alternative heat/fuel sources for the cabins.

B. Standardize all park and PATC signs for the cabins.

C. Continue to monitor the grounds around the cabins for buildup of charcoal and cooperate with the PATC in educating cabin users to employ minimum impact practices around cabin areas.

6.6 Cultural Resources

A. Existing historic structures, particularly those not routinely maintained, should be documented and photologged to aid in protection against damage and theft.

B. "Cultural resources" should be defined and identified very specifically so that appropriate protection of backcountry historic structures and other "traces" can be determined and performed as appropriate.

C. All existing structures should be evaluated for National Register eligibility by way of either a formal determination of eligibility or as part of the List of Classified Structures survey.

D. A parkwide archeological overview and assessment should be undertaken to identify all areas of potential archeological sensitivity.

6.7 Administrative Roads

A. Complete cultural compliance process for roads recommended for abandonment.

B. Continue to evaluate the need for existing administrative roads as trends/needs change.

C. Maintain remaining administrative roads to provide for safe travel for the intended purpose (concessionaire/employee use vs. service road use), and to protect erosion and degradation of the resource.

D. As roads are closed to vehicular traffic and become foot or horse trails, rehabilitate trails to conform with current trail maintenance standards.

6.8 Backcountry Signs

A. Develop a backcountry sign manual to include description of types of backcountry signs, maintenance needs and responsibilities for each type of sign specific to SNP. Such a manual should incorporate guidelines from NPS-88, National Park Service Sign Guideline.

B. Develop a review process for evaluating the effectiveness and need for signs which are temporary in nature or the exception to the above guidelines.

C. Continue GPS/GIS parkwide backcountry signs survey to complete computerized inventory database.

D. Consider placement of signing at wilderness trailheads, such as that done at USPS wilderness areas, to indicate wilderness designation to the public and employees to enhance wilderness awareness and management. This would be accomplished in conjunction with improved SNP wilderness education of the public for awareness of wilderness values and visitor expectations of risk, challenge, and opportunities for solitude in SNP wilderness.

Chapter 7, RECREATIONAL USES OF THE BACKCOUNTRY

7.1 Rock Climbing

A. Develop a climbing Plan as a subplan to the BWMP with public involvement from organizations such as PATC Mountaineering Section, The Access Fund, Nationalk Outdoor Leadership School and local climbing enthusiasts. SNPO needs to better understand and address impacts to resources associated with climbing activity and assure that actions taken are consistent with NPS recreation and wilderness management directives and guidelines.

7.3 Horse and Pack Animal Use

A. Develop a site bulletin to provide information on pack animal use within the park and to educate horse users in Leave No Trace backcountry use ethics.

B. Research, select, and implement appropriate backcountry camping strategy for pack animal users (ie. limited designated campsites).

C. Encourage local horse clubs and individual riders to take active responsibility in trails maintenance, particularly treadwork, if the horse trail system is to be preserved at its present level.

D. Evaluate the need for and consequences of permitted commercial horse use on non-wilderness trails (Incidental Business Permit).

7.4 Pets

A . Consider additional restrictions for “pet-free” areas to reduce visitor and wildlife/dog conflicts and impacts.

7.5 Fishing

A. Periodic regulatory review of the fishing regulations will occur as part of the Park Compendium revision process.

B. Additional public use limits and closures may be implemented due to severe weather events.

7.9 Hang Gliding

A. Launch sites should be monitored for resource impacts and site maintenance and rehabilitation needs. The launch site at Millers Head should be closely monitored for trampling impacts to endangered area vegetation as described in the National Heritage Report. Access trails should be signed and maintained. Local hang glider clubs might participate in a site maintenance program addressed by a Memorandum of Understanding (MOU).

Chapter 8, TRAIL MANAGEMENT

8.3 Trail Maintenance Standards

A. Use Global Positioning System (GPS) to assist in trail maintenance and management.

B. Revisit, revise trail maintenance standards and review trail system requirements as storm damage impacts are assessed.

Chapter 9, BACKCOUNTRY CAMPSITE MANAGEMENT

9.3 Backcountry Campsite Management

A. Formalize designated backcountry campsite selection criteria and-management guidelines. Select designated backcountry campsites in areas where it is deemed necessary.

B. Based on the most recent impacted backcountry campsite inventory, identify the priority areas where backcountry campsite rehabilitation is needed.

9.4 Sanitation and Public Health

A. As designated campsites are established, pit toilets must be installed at high-use sites and all designated site areas must be monitored for excessive human waste buildup.

B. Monitor fecal counts in water sources located near heavily used backcountry campsites or day use areas. Determine who will perform this work.

C. Evaluate the need for water system at Byrds Nest #3; eliminate the system if appropriate.

Chapter 10, RESEARCH AND MONITORING

10.1 Backcountry Campsite Impact Inventory and Monitoring

A. Implement a long term backcountry campsite monitoring program at SNP. This would include identifying personnel responsible and budget needs for field implementation and data management.

B. Identify and establish backcountry management personnel responsible for overseeing monitoring programs, analyzing data for comparison with established indicators and standards, and recommending management actions when standards are approached or exceeded.

C. Options are designated campsites or area closure to camping where significant cultural resources are being impacted.

10.2 Backcountry Trail Condition Inventory and Monitoring

A. Develop a more consistent and quantitative method for monitoring and inspecting trail conditions at SNP.

10.4 Social Inventory and Monitoring

A. Conduct a social science survey of backcountry visitors to: 1) identify appropriate social indicators and their current range of conditions within the recreational opportunity classes defined by this plan, 2) describe their perceptions of existing trail and campsite conditions, 3) describe their perceptions of existing and planned camping regulations, and 4) develop an efficient monitoring program for social science indicators. An Old Rag area social science survey may be conducted separately prior to the parkwide survey due to critical management issues at that location.

B. Develop standards for social science indicators and implement a routine monitoring program.

10.5 Data Collection and Management

A. Develop a system for collecting and archiving collected backcountry monitoring data with the Division of Natural and Cultural Resources.

Chapter 11, INTERPRETATION AND EDUCATION

11.1 "Minimum-Impact" Backcountry Use Education

A. Personal Contact Strategies:

1. Establish a backcountry user information hotline. This phone line would be available to potential backcountry users during park business hours. It would be answered, during the height of the backcountry season, by a limited number of rangers who are well informed on backcountry concerns in order to provide consistent and accurate information. A recorded information message would be provided to callers after hours and allow callers to leave a message for a return call or mail information request.

2. Increase backcountry user contacts with rangers at busy trailheads and on trails. Though law enforcement backcountry patrols are important in detecting and monitoring visitor impacts, they may have limited effect in influencing visitor behavior as damage may be done by the time a ranger contact is made. Contacting visitors at the trailhead or on the trail, at optimum times of the day, can prevent resource and social impacts by reaching and educating the uninformed and unskilled backcountry user before they have had a chance to damage the resource and degrade the experience of other visitors.

3. An optional backcountry certification workshop or course will be conducted regularly or as a scheduled interpretive activity. Participants will be certified as a park LNT

camper and upon course completion issued a card which certifies the user's knowledge of park backcountry management principles. The only requirement for future backcountry use will be for the permit holder to file a trip itinerary and possess their permit card each time they use the backcountry.

4. Interpretive programs will be conducted in each district throughout the core visitor season. Programs would include minimum-impact camping and what to do if lost in the woods. Target audiences will be day users and unskilled first-time backcountry users.

B. Written Information Strategies:

1. A backcountry newsletter will be printed annually and sent to all persons who were issued a backcountry permit for the previous year. The target audience is, of course, repeat users of the park's backcountry. Emphasis of the newsletter will be on backcountry management concerns, updates on policies and regulations, and suggested alternative hikes to lessen, impacts on heavily used areas.

C. Multimedia Strategies:

1. Develop a "user-friendly" computer program using touch screen exhibits and information systems to dispense information about the backcountry in a sequential decision-making format. Touch screen exhibits will be placed at each visitor center and programmed in a decision-tree format. The format will allow the user to use their own decision-making criteria in their own preferred sequence. The program can be used by all target audiences, because they could select the information that would be most useful or beneficial to them. The exhibit can be programmed to offer instruction in LNT camping techniques or help someone choose a trail that meets their personal desires and experience level.

2. Create a video program which can be used at backcountry camping permit issuing stations to educate backcountry users on LNT camping techniques. This program can also be provided to outside organizations and local outfitters.

EVALUATION OF EDUCATION AND INFORMATION STRATEGIES

1. In cooperation with Virginia Tech and other interested institutions, conduct social science surveys on each strategy implemented to evaluate its relative effectiveness. Make adjustment and improvements to the strategies as needed.

2. Interpretation efforts will use focus groups as an evaluation tool to assess the effectiveness of such strategies as the minimum-impact camping video, interpretive presentations, workshops cm minimum-impact camping, and the computer touch screen exhibit. Evaluating by focus groups is a structured group discussion by park visitors on specific interpretive programs or information services. Focus groups reveal visitor's attitudes toward and perceptions of the interpretive program or information service. The

results of the evaluation will be a written summary of visitor's verbal responses to questions about these services. Interpreters will follow the guidelines as set forth in the training package prepared for the NPS entitled, "Focus Groups: **A** Tool for Evaluating Interpretive Services. "

Chapter 12, BACKCOUNTRY CAMPING PERMIT SYSTEM

12.1 System and Administration

A. Produce interpretive displays for backcountry camping permit stations (rotate use to self-registration stations during winter months).

B. Produce backcountry site bulletin/maps.

C. Emphasize face-to-face permit issuance contacts using strategies described in this section of the plan. Reduce availability of self-registration permits during peak visitor periods.

D. Establish "business hours" for backcountry camping permit issuance and publicize this information through brochures and entrance station signing. Do not issue permits outside of these hours and step up enforcement of the "required permit" regulation.

12.2 Backcountry Camping Permitting Procedures

A. Implement all new procedures as described in this section.

B. Develop a computerized permitting system per the approved, NRPP proposal.

12.4 Backcountry Fees

A. Design and incorporate backcountry camping permit fees program into backcountry program planning in anticipation of permit fees to be charged to backcountry campers.

Chapter 13, PARK BOUNDARY MANAGEMENT

13.2 Boundary Access

A. Confirm all boundary access points as described by the Park GMP. Obtain guaranteed (deeded) access right-of-ways at boundary access trailheads which do not have this status and abandon those accesses which do not favor public use.

B. Foster good relationships with Park boundary neighbors; assure Park administrative access for emergency use where public boundary access does not exist.

C. Perform a social science survey in the Old Rag boundary area to assess backcountry visitor perceptions of Old Rag area conditions, identify appropriate social indicators for

the area, and develop an efficient monitoring program for social science indicators.

D. Examine boundary trailhead public access points for feasibility for possible implementation of a boundary access permit/fee program.

13.4 Boundary Marking Guidelines and Standards

A. Assure that each district has staffing to perform routine seasonal boundary marking; perhaps develop a crew which rotates between this and other backcountry maintenance responsibilities.

Chapter 14, BUDGET and STAFFING NEEDS

A. Strive to meet staffing needs to improve the ability of the SNP backcountry/wilderness program to meet GPRA goals.

B. Manage NRPP planning and funding to successfully accomplish initial implementation of the BWMP.

16.4 Tables and Figures

Table 1.1 Backcountry Visitor Regulations established in 1974.

Table 1.2 Backcountry Management in SNP.

~~Figure~~ Table 2.1 Overnight Backcountry Visits to SNP (1953-1992).

Table 2.2 1976 West Virginia University backcountry social survey.

Table 2.3 1977 Trail user survey.

Table 4.1 Schematic of the LAC planning framework.

Table 4.2 Summary of Resource and Social Setting Components for Opportunity Classes.

Table 4.3 Summary of Managerial Setting Components for Opportunity Classes.

Table 4.4 Resource Indicators and Standards for each Opportunity Class.

Table 4.5 Social Indicators and Standards for Each Opportunity Class.

Figure 4.6 North District Opportunity Class Map.

Figure 4.7 Central District Opportunity Class Map.

Figure 4.8 South District Opportunity Class Map.

Table 6.1 PATC hut information.

Table 6.2 Summary of Backcountry Signing Guidelines Based on Opportunity Class.

Table 7.1 Trails or portions of trails open to horse and pack animal use.

Table 7.2 SNP Fishing Regulations and Guidelines

Figure 9.1 Use/impact relationship for selected impact parameters from a study of campsites in the Boundary Waters Canoe Area.

Figure 9.2 A comparison of campsite impact and recovery rates.

Table 9.3 Number, size, and amount of soil exposure on campsites by condition class.

Table 9.4 Campsite condition class definitions.

Table 9.5 Number and percent of illegal campsites by campsite legality factor.

16.4 Table and Figures, continued

Table 9.6 Recommended backcountry camping regulations.

Figure 9.7 Illustration of a typical arrangement for the placement of designated campsites.

Table 9.8 Campsite Selection Criteria.

Table 10.1 Resource impacts caused by camping activities.

Table 10.2 Capabilities of visitor impact monitoring systems.

Figure 12.1 Sample, Completed Backcountry Camping Permit.

Figure 13.1 Boundary marking: two paint blazes needed on larger trees.

Figure 13.2 Boundary marking: marking a tree to signify a boundary corner.

Shenandoah National Park

Wilderness "Minimum Requirement " Decision Tree

In accordance with Section 4 of the Wilderness Act, NPS Director's Orders, and the SNP Backcountry and Wilderness Management Plan, the "minimum requirement" for administration of Shenandoah National Park wilderness is documented by this Decision Tree process to determine if uses and activities otherwise prohibited by the Wilderness Act can be allowed and, if they are allowed, the most appropriate methods to complete those actions within wilderness. **The minimum requirement process applies to all administrative actions, programs, and activities within wilderness.** Long-term programs, actions, and recurring activities may be requested for approval for up to a three year period. Any approved program or activity may be revoked by the Superintendent if not in accordance with the original request..

This form is also used in conjunction with the SNP Project Clearance Form as part of the internal park planning process to review and document projects for environmental and cultural compliance.

PART I. Decision Screening Questions

Consider the following questions to evaluate the potential impacts of the proposed action on the SNP wilderness resource:

- Does the proposed action allow wilderness to retain solitude and elements of surprise and discovery?
- Did you evaluate the traps of making decisions based on economy, convenience, comfort, or commercial value?
- Did you look beyond the short-term outputs to ensure that future generations will be able to use and enjoy the benefits of an enduring resource of wilderness?
- Does the action assure that the effects of human activities do not dominate natural conditions and processes?
- Does your decision assure that people can continue to use and enjoy the area as wilderness?
- Did you assure yourself that this proposed project or management action is truly necessary and, if so, is it the minimum action required?
- Is your action or project consistent with SNP wilderness management objectives stated in the Backcountry and Wilderness Management Plan?

If your answers to all questions are "yes", proceed to Part II.

PART II. Minimum Requirement Decision Checklist

Action or Project:_____ Proposed Start Date:_____

Location (attach map):_____ Prepared By:_____

Brief Description of Action or Project (not necessary if documented on Project Clearance Form): _____

_____

_____

_____

_____

Choose and "X" the Category which best fits yourproposed action and comply with codes:

CATEGORIES	"X"	CODES
1. Pre-existing facility or structures - maintenance or improvements ***(examples: bridges, research facilities, buildings, campsites)***	_____	**a, c, d, e**
2. New facility or structures - construction ***(examples: bridges, research facilities, pit toilets, campsites, communications towers)***	_____	**b, c, d, e**
3. Unexpected needs ***(Unpredictable maintenance or project needs such as storm impacts, plane crashes)***	_____	e
4. External requests ***(requests to allow certain activities and uses that are generally prohibited coming from researchers, permittees, private landowners, other agencies)***	_____	**c, f**
5. Mitigation of prohibited or illegal activity ***(examples: surveillance devices to detect or monitor hunting and other poaching activity, snowmobile trespass)***	_____	**e, g**
6. Employee or public safety ***(example: response to employee or public health and safety situation)***	_____	***e***
7. True emergency needs ***(example: SAR response, emergency public safety incident)***	_____	h -

CODES:

a. All facilities and structures should be evaluated to determine if they are the minimum necessary for administration of the area as wilderness and for their historical significance. Perform a needs assessment. Once the needs assessment is completed and it is determined that maintenance or improvement is necessary, evaluate what "minimum tool" will be used to preserve wilderness character.

b. Any new facilities or structures in wilderness need to be scrutinized closely to determine that they are the minimum necessary for the administration of wilderness.

c. May require analysis and documentation through the park Project Clearance Form and compliance with NEPA and NHPA.

d. Any public facility may require compliance with the Americans With Disabilities Act (ADA). Use the Wilderness Access Decision Tool publication, developed by Wilderness Inquiry, Inc., to aid in this decision-making.

e. Requires "minimum tool" evaluation to determine the necessity and extent of the project and the tools that will be used to accomplish the task. Use Part III of this form for minimum tool evaluation.

f. Determine whether there is a special use authorization or legal claim.

g. If an illegal activity takes place in the wilderness or is anticipated, certain mitigations or precautions may be taken. If the illegal activity is a recurring problem, a minimum tool analysis can be completed once with appropriate responses for various situations.

h. A true emergency is a situation involving immediate threat to human life and property that involves an inescapable urgency and temporary need for quick response beyond that available by primitive means. Emergencies do not require documented analysis prior to approval of a generally prohibited activity or use in wilderness. The Incident Commander responsible for managing the emergency response needs to determine quickly whether a true emergency exists and should be trained in the minimum tool concept. The rationale for authorizing such use should be documented for reporting purposes.

PART III. Minimum Tool Evaluation

Minimum Tool ***is a use or activity, determined to be necessary to accomplish an essential task,*** *which makes use of the least* ***intrusive tool, equipment, device, force, regulation or practice that will achieve*** *the wilderness* ***management objective.***

On a supplemental sheet, very briefly (please keep to one page or less) provide the following:

A. Describe the proposed use of mechanical or motorized equipment or transport. Include a statement of the quantity of work to be 'completed and the type of mechanical or motorized equipment to be used.

B. Describe a minimum of three alternatives, including:

1. **No Action.** What will happen to the wilderness resource and its uses without the proposed project'?

2. **Alternative without mechanized or motorized equipment.**

3. **Alternative using mechanized or motorized equipment.** Emergency circumstancea (ie. involving human safety and fire) and mitigation of unacceptable derogation of park resources (Redwood Act as amended) are important considerations for allowing use of mechanized equipment in wilderness.

C. Briefly analyze and compare the alternatives. Mechanized or motorized equipment use can only be approved to meet minimum requirements for the administration of the area as wilderness.

D. Discuss the preferred alternative and appropriate mitigatior: measures. State which mitigation measures can be used, for example:

"Time the work for weekdays or off-season."
"Project activity is near camping areas, work will shut down k-fore evening."

E. Describe any planned public information and education to be conducted.

PART IV. Recommendation and Approval:

Comments:

_____

_____

_____

Signature of the Chief, Division of Natural and Cultural Resources indicates recommendation of the project or activity, generally prohibited by the Wilderness Act, as meeting the minimum requirement for administration of SNP wilderness. Recommendations of staff specialists are consistent with NPS policy and park protocols.

RECOMMENDATION: _____ _____

Chief, Division of Natural and Cultural Resources Date

DECISION:

Comments:

_____

_____

_____

PROJECT IS APPROVED:

_____

Superintendent/Asst. Superintendent Date

PROJECT IS DISAPPROVED:

_____

Superintendent/Asst. Superintendent Date

(FORWARD COPY OF COMPLETED "DECISION TREE" TO SNP BACKCOUNTRY AND WILDERNESS MANAGER)