

**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

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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:

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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 established 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 1131-1136), 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 paralleling 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 Inventory 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 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. 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 permissible 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 accommodate 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 accommodate 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. SNP 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.

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

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.

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 accommodate 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 accommodate 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 all 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:

Alternative **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 existence 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	

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.

(APPENDIX C, continued)

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
<u>Resource Setting:</u> 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
<u>Social Setting:</u> 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
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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
<u>Managerial Setting:</u> 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 fire 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

APPENDIX F

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The draft BWMP has been circulated among Shenandoah National Park employees for review and comment. Update and revision has been continuous since the draft BWMP was completed in 1994.

Agencies, Organizations, and Persons to Whom Copies of the Draft BWMP Were Sent for Consultation and Review (1994)