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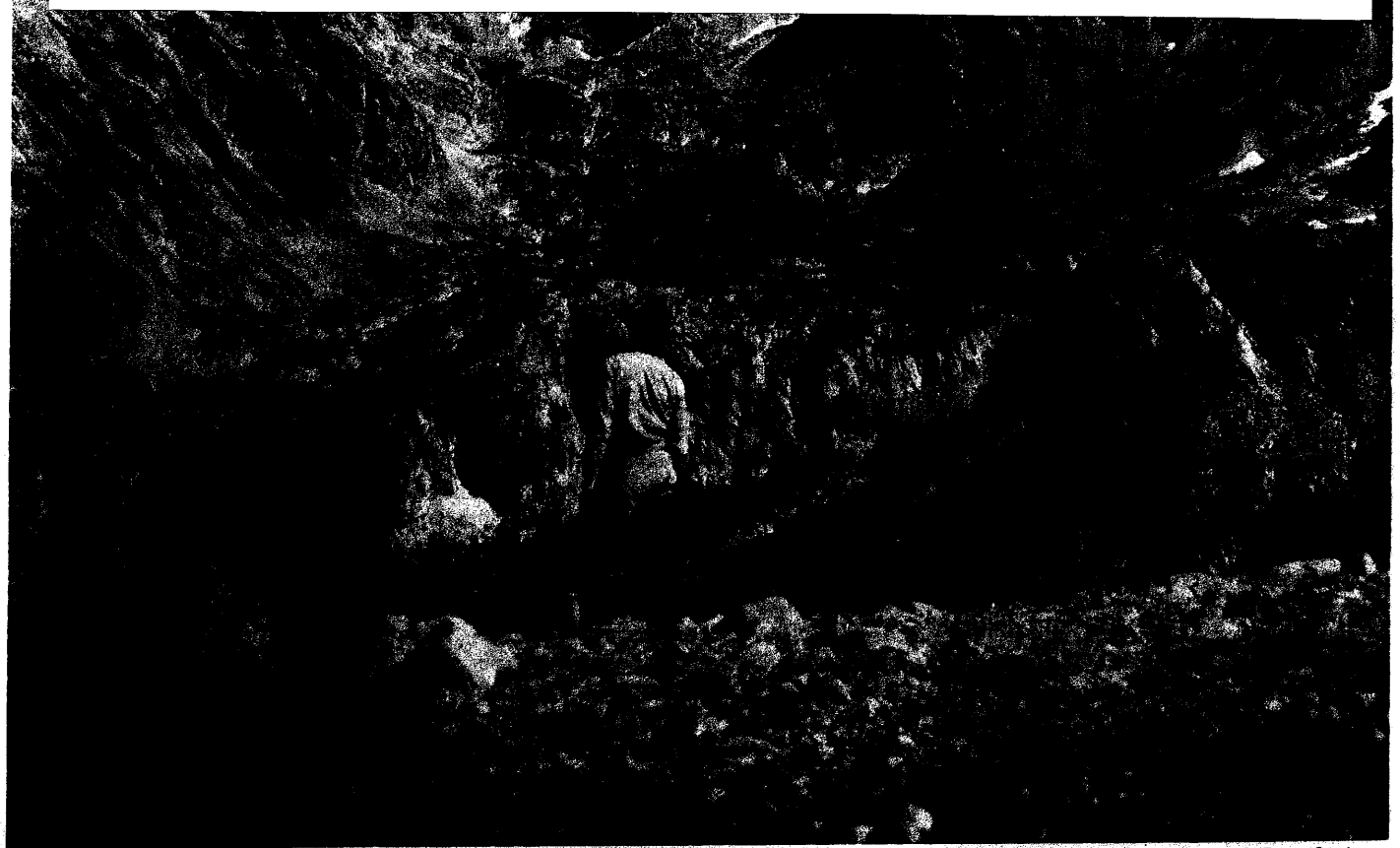

U.S. Forest Service

Wilderness management: Has it come of age?

By David N. Cole

After 25 years of existence, the size and diversity of the National Wilderness Preservation System have placed increasing pressures on managers to maintain the original goals of the system

SEPTEMBER 3, 1989, marked the 25th anniversary of the signing of the Wilderness Act. A quarter century has passed since President Johnson's signature created the National Wilderness Preservation System (NWPS), making it "the policy of Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness."

This has been a period of controversial debate over how much land and which land to designate as wilderness. During this period, it also has become increasingly apparent that managing this land so wilderness qualities will endure is a difficult and complex task.

So what is the status of wilderness 25 years after the Wilderness Act? How has the NWPS changed? How has management of wilderness progressed? What are some of the most prominent strengths and weaknesses of current programs? And what are the foremost management challenges for the future?

A large and diverse system

During the first 15 years of its existence, the wilderness system increased slowly but steadily in size. In 1964, the Wilderness Act created 9.5 million acres of "instant wilderness." Total acreage had doubled by 1978. In 1980, total acreage mushroomed to 80 million acres, when Alaska land was designated for the first time. As the 1990s begin, the system consists of 91.5 million acres in 487 separate wildernesses areas. This represents about four percent of the total land base of the United States and 15 percent of all federal public land. Although more than

David N. Cole is a research biologist and project leader, Forestry Sciences Laboratory, Intermountain Research Station, Forest Service, U.S. Department of Agriculture, P.O. Box 8089, Missoula, Montana 59807.

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60 percent of the wilderness acreage is in Alaska, about 35 million acres of wilderness have been designated in other states.

So the system has become large. Its size already exceeds not only the dreams of early wilderness advocates, such as Aldo Leopold and Howard Zahniser, but also the estimates of early wilderness researchers (*15*). Moreover, tens of millions of additional acres probably will be added from Bureau of Land Management land; roadless Forest Service land in such states as Montana and Idaho; and land in National Parks, such as Glacier, Yellowstone, and Grand Canyon.

The system also has become highly diverse. The "instant wilderness" created by the Wilderness Act was primarily mountainous Forest Service land located in the West. Today, wilderness land is administered by four federal agencies and located in 44 of the 50 states. Wilderness land is found at all elevations, from sea level to the tops of the tallest peaks, and the areas preserve a wide variety of ecosystem types, from alpine tundra to shortgrass prairie, swamp, and ocean strand. Of the 261 basic ecosystem types found in the United States and Puerto Rico, 157 are found in currently designated wilderness, and predictions are that representation will increase to about 200 ecosystem types by the year 2000 (*2*). In 1964 the largest wilderness was about 1.25 million acres, the smallest 5,400 acres. Today, wilderness areas range in size from the 8.7-million-acre Wrangell-St. Elias Wilderness in Alaska to the five-acre Oregon Islands Wilderness—three rocks off the Oregon coast that are virtually inaccessible, even by boat, but rich with wildlife.

The nature of a typical wilderness area also has changed over the years. Leopold's early definition of the ideal wilderness was "a continuous stretch of country preserved in its natural state...big enough to absorb a 2-week pack trip" (*5*). Even in 1964 most wilderness failed to meet this ideal; barely one-third of all wildernesses exceeded 100,000 acres. Most of the wildernesses designated since then are much smaller, and they do not always contain the spectacularly scenic country that the earliest areas did. Today, only one wilderness in five exceeds 100,000 acres, and one in six is less than 5,000 acres (*12*)—an area that can usually be crossed easily in a few hours.

Wilderness is located much closer to more people now; virtually everyone in the United States can reach at least one wilderness with a drive of less than one-half day. The fact that wilderness areas are smaller and closer than they have been in the past may partially explain the observation that wilderness trips appear to be getting shorter, with day-use increasingly important (*14*).

Use of wilderness has increased since 1964, both in amount and diversity. The amount of recreational use has increased several times, although it has stabilized in recent years (*8*). Certain types of recreation, such as whitewater boating and cross-country skiing, have become much more common in wilderness areas, and new sports are constantly arising.

The Wilderness Act was quite explicit about recreation being only one of the many values of wilderness, and these other values—ecological, geological, scientific, educational, scenic, and historical—are increasing in importance. There now exists a few wilderness areas, administered by the Fish and Wildlife Service, where no recreational use is allowed because it would threaten the ecological and scientific values for which the areas were established. These additional values are frequently endangered by internal threats other than recreation, such as domestic livestock grazing and mining, as well as by external threats, such as acid rain and dewatering of streams by irrigators.

In addition, wilderness managers are challenged by the inclusion of increasingly specific management direction in individual pieces of wilderness legislation. Most of this specificity concerns management of nonconforming uses, such as domestic livestock grazing, which occurs in many wilderness areas, and the landing of aircraft, which occurs in a few. This sort of specificity often makes it more difficult to achieve the primary goals of wilderness management, such as maintaining natural conditions and providing outstanding opportunities for solitude.

Wilderness management today

In a paper published more than 15 years ago in this journal, Robert Lucas (*7*) argued that management of wilderness is imperative—that wilderness cannot survive the draw-a-line-and-leave-it-alone philosophy. Today, this belief is generally accepted. A recent conference on managing wilderness drew more than 600 participants, most of whom work for federal land-managing agencies. The increasingly large and diverse wilderness preservation system, intended to supply a great variety of benefits to present and future generations, presents a constant challenge to management.

The question arises: How well and in what ways has management responded to this challenge over the last 25 years? This question was the focus of a 1988 congressional oversight hearing on wilderness management, conducted by the House Subcommittee on National Parks and Public Lands. Wilderness rangers, wilderness users, researchers, and members of conservation organizations testified at the hearing. Subcommittee chairman Bruce Vento's summary of the hearing, as expressed in a letter to the chief of the Forest Service, was that, with "impressive unanimity in the record," witnesses "agreed that the national forest wilderness system is deteriorating and that Forest Service wilderness management has been weak and inadequate."

The question of adequacy of wilderness management was also the focus of a study by the Government Accounting Office (GAO). The GAO reported that extensive resource damage is occurring in wilderness (*17*). Investigators found extensive damage to trails and camping areas, problems caused by livestock, inadequate disposal of human waste, and abundant garbage and litter. Perhaps most disturbing, they found that because of a lack of baseline and monitoring data on recreational use and resource conditions, it is impossible to determine the full extent of deterioration or to ascertain the trend in conditions. Although confined to Forest Service wilderness, the findings of both the oversight hearing and the GAO study are considered indicative of conditions in wilderness managed by other agencies (*18*).

Management of wilderness requires as diverse an array of information and skills as any job imaginable. The manager must maintain ecological processes and natural conditions, as well as provide outstanding primitive recreational opportunities and solitude. In many wilderness areas, management is further confounded by provisions for nonconforming uses, such as mining and grazing of domestic livestock. To meet these objectives, management programs must be aggressive rather than passive. Aggressive management means developing a good understanding of the conditions and processes that make up the wilderness resource—air and water quality, wildfire, recreation, and much more. It means establishing quantifiable objectives for the conditions the wilderness is to provide, as well as monitoring conditions to see if objectives have been met. And it means developing management strategies and implementing action plans for dealing with situations where objectives are not being met.

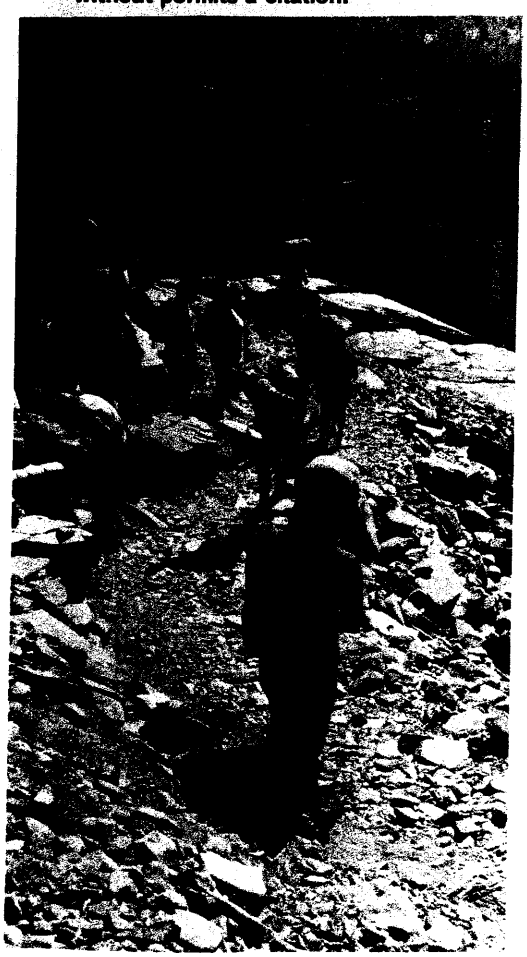
Few examples of aggressive wilderness management can be found; benign neglect is a more accurate description of most programs. A recent survey of the managers of all wilderness areas (*13*) found, for example, that studies of the natural environment and of wilderness users are being conducted in only 37 percent and 14 percent of wilderness areas, respectively. Barely one-third of all wilderness areas have an approved man-

agement plan; even fewer areas have established quantifiable objectives for the conditions they are trying to provide or maintain. Only one-quarter of all areas have a full-time staff person whose primary responsibility is wilderness.

Progress in management

Wilderness management has made some progress, however, particularly in dealing with the management concerns described by Lucas (*7*) more than 15 years ago: developing the capability to let fire approximate its natural role, providing for quality recreational experiences, and controlling the impacts of recreationists on the environment. That these should be the major success stories should not be surprising because these are the concerns that have been most frequently articulated and that have received the most research attention. Progress has been most pronounced in situations where research has provided a substantial base of technical information, where managers have taken the time to carefully plan a course of action, and where resources were available to adequately implement plans.

Many wilderness areas are crowded. To enhance opportunities for solitude, many wilderness area managers now require permits, and, as here in the Desolation Wilderness in California, issue visitors without permits a citation.



Fire management. The most dramatic change in wilderness management policy has been in the area of fire management. In the early 1960s all but a few heretics still considered fire an evil. Today, the important role of natural fire in wilderness has widespread recognition. In 1983, more than 700 people from around the world attended a four-day symposium devoted entirely to the subject of wilderness fire research and policy (*6*). We now know a lot about fire histories and the natural role of fire, fire effects, fire behavior, and how to restore fire in wilderness (*4*). This technical information has been instrumental in developing plans that permit fire to exercise a more natural role in many national parks and wilderness areas.

We are still a long way from being able to let fire play a natural role in wilderness, however. This was made painfully obvious during, and particularly after, the dramatic Yellowstone fires of 1988. In contrast to extensive research on fire behavior and effects, little information was available on the social and economic impacts of large wilderness fires (*19*). Fire management plans had been developed, but they were inadequate. For example, coordination and communication among managers of various wilderness units and particularly different agencies was often poor. Resources devoted to educating the public about wilderness fire were not sufficient to generate the necessary political support. Consequently, programs that permit a more natural role for fire in wilderness have been in temporary retreat.

Opportunities for solitude. Another change has been the enactment of management strategies intended to increase opportunities for solitude in wilderness. In the early 1960s, few wilderness areas had active visitor management programs. Since then, research has improved understanding of the motivations of wilderness recreationists (*10*) and the relationship between use intensity and visitor satisfaction. It is known that some, but not all, visitors are quite sensitive to the number of other parties they encounter. Also, type and location of encounters is often more important than the number of encounters (*9*). In many wilderness areas, the maximum number of people allowed to travel and camp together, as a group, has been limited. This reflects both a change in the definition of what constitutes a quality wilderness experience and a recognition that large parties have a substantial negative impact on other parties.

The most dramatic response to concerns about lack of solitude has been to limit the number of people allowed to enter a wilderness. This is common practice in the National Park Service, where even 10 years ago use was limited in about one-half of the agency's wilderness areas (*20*). The Forest Service, in contrast, has been more inclined to use education to change visitor behavior. Instead of regulating the amount of use, managers of Forest Service wilderness areas are more likely to simply inform visitors of crowded and uncrowded times and places and to suggest that visitors select the uncrowded situations.

Although many of these actions seem justified, most can be variously challenged as arbitrary, unnecessary, or ineffective. Management plans seldom provide specific objectives for visitor experiences, so it is difficult to say whether any action is necessary to meet objectives. Because of a general lack of monitoring, evaluation of program effectiveness is impossible. Research is still struggling to define solitude and the factors that influence the quality of wilderness experiences. Few attempts have been made to publicly debate such questions as what solitude is and where it should be provided. Is it acceptable, for example, to have some places in wilderness that do not provide outstanding opportunities for solitude? Perhaps most discouraging is the tendency for managers to dismiss aggressive management programs as too costly.

Ecological impacts. Progress also has been made in developing and implementing programs designed to minimize the ecological impacts of recreational use. Research has provided a good understanding of the linkages between certain visitor behaviors and resultant impacts. The effects of camping on vegetation and soil are particularly well understood (*1*), as are the implications of this information for campsite management in wilderness (*3*). In a few cases, this technical information has been used within a planning framework, such as the "limits of acceptable change" process (*16*). In this process, specific objectives are established for the number, condition, and location of campsites; campsites are periodically monitored to assess whether objectives are being met; and an array of management strategies are formulated to deal with situations in which objectives are not being met.

At Sequoia and Kings Canyon National Parks, for example, use quotas have been established to avoid large concentrations of users and campsites in specific destination areas. The number of campsites has been reduced by rehabilitating excessive and poorly located sites. Certain places are closed to camping; certain places have a one-night camping limit; and minimum-impact camping techniques are advocated. Resource

damage has been reduced (*11*) without greatly diminishing the freedom and spontaneity of the visitor experience.

Although the widespread interest in planning systems, such as limits of acceptable change, is encouraging, the ability to limit adverse impact through this process is constrained by several factors. One factor is the lack of technical information on many types of recreational impact, such as impacts on animals and on aquatic systems. A second problem is the lack of resources available either to monitor conditions or to implement needed management programs. Many wilderness areas do not have sufficient staff to deal with even the symptoms of inappropriate use—to pick up trash or clean up campsites; consequently, the causes of problems are seldom tackled.

Visitor impacts on wilderness can be severe, particularly at popular campsites, such as at this one (top) near Ice Lake in the Eagle Cap Wilderness in Oregon. Intensive management techniques, such as this built-up section of trail in the John Muir Wilderness in California (bottom), can preserve resources but also intrude on the natural scene.

Toward better management

Improvements in wilderness management have not kept pace with the increases in size, diversity, and challenge facing land managers. In the words of Congressman Vento, "The time has come to end tentativeness in wilderness management. Now is the time for strong and aggressive wilderness management leadership." He concludes that we need a new wilderness revolution in the 1990s to provide better management of our wilderness areas—a revolution involving people from federal agencies, Congress, and interest groups (*18*).

Internal changes. Many of the revolutionary changes needed are internal to the agencies that manage wilderness. Because many of these changes require increased funding, Congress also must play an important role. Important changes include:

► ***Expand research programs.*** The foremost success stories in wilderness management—programs for wilderness fire, use limitation, visitor education, campsite management, and development of the limits of acceptable change process—have all been based on a substantial foundation of research. With the exception of fire, most of this research has been in recreation. More recreation research is needed, but we also should work on some of the ecosystem management aspects of wilderness. At this point we do not even have a vocabulary for describing in specific terms many of the conditions we are trying to provide in wilderness. Beyond platitudes about natural conditions and processes (however these might be defined), how can we describe a healthy wilderness ecosystem? And what should we monitor to ascertain whether the system is healthy? These are questions that must be answered if we expect to maintain quality wilderness resources into the future. The Forest Service employs only two scientists who work on wilderness management research, and the other federal agencies have no wilderness research programs whatever. Clearly, these complex problems will require a more substantial effort.

► ***Encourage careful planning, including monitoring.*** Currently, managers of most wilderness areas cannot state specific management objectives. They do not have accurate estimates of the amount of use the wilderness receives; data on resource conditions and user attitudes and preferences are even more scarce. Less than 40 percent have a management plan of any kind (*13, 17*). It is no surprise, then, that management programs are often called arbitrary, unnecessary, and ineffective. Planning based on specific objectives and monitoring is critical to professional wilderness management.

► ***Improve the qualifications and training of wilderness personnel.*** Individuals assigned to wilderness often have little or no training in wilderness management. A degree in a subject related to wilderness is seldom a requirement, and personnel are more likely to get on-the-job training in law enforcement or fire fighting than they are in wilderness management. This contrasts greatly with the requirements and training opportunities in other fields, such as timber management, fire management, and wildlife management, despite the fact that wilderness

management is every bit as complex and difficult. Federal agencies must require wilderness personnel to be trained adequately, and they must provide training opportunities.

► ***Increase the accountability of managers with line responsibility.*** Managers naturally tend to spend most of their time and resources on responsibilities for which either the rewards of success or the costs of failure are high. Few managers with wilderness responsibilities are either rewarded for doing a good job or held accountable for doing a poor job. Consequently, wilderness management tends to receive less priority than programs for which managers are held accountable, such as meeting a timber harvest target. Wilderness management will not improve substantially until more resources are allocated to wilderness. And in times of fiscal restraint, this is unlikely to occur unless wilderness is defined as a critical responsibility reflected in the evaluation and reward system of line officers (*10*).

External changes. If we are to see improved wilderness management, public interest groups must broaden the scope of their activities. In 1973, Lucas (*7*) lamented the fact that the public has been concerned almost exclusively with which areas should be designated as wilderness. In his 1988 testimony before the House Subcommittee on National Parks and Public Lands, Lucas noted that this situation has not changed. Interest groups seldom have become deeply involved in the issues associated with management of wilderness, and they have not pressured agencies to provide greater protection of wilderness resources. Wilderness management would benefit from the following changes:

► ***Press for professional management.*** Federal budgets are tight and likely to remain that way. The pressure exerted by constituencies strongly influences the allocation of funds both among and within agencies. Greater commitment to wilderness management is not likely until wilderness advocates demand it. Other resources, from wildlife to timber, have organized groups that lobby for better treatment. The conservation community must demand more aggressive management to protect and restore wilderness qualities. Only then can these interest groups be assured that the victories they have won for wilderness designation will be translated into lasting preservation of wilderness.

► ***Make more substantial contributions to wilderness management.*** With time, wilderness will be increasingly valued for its scientific attributes. It will hold much of the biodiversity in the United States, and it will provide examples of relatively undisturbed landscapes to contrast with those heavily manipulated by humans. The academic community can make substantial contributions to the preservation of wilderness values. Some schools provide training in wilderness management, but more are needed. Few programs offer more than a course or two on the subject. These institutions also can supplement the wilderness management research being funded by the federal government. Many disciplines—from ecology to social science and philosophy—have unique perspectives to contribute. Finally, scientists should initiate studies that use the laboratory that relatively undisturbed wilderness offers. This will provide further evidence of the value of wilderness and should increase support for professional management.

► ***Become involved in debates about objectives for wilderness.*** Wilderness management is fraught with countless compromises and tradeoffs, always with important consequences to different users. In a popular day-use area, should a permit system be established to reduce use and provide more solitude? Or should unrestricted access be allowed to continue because that is the way it always has been and users like it that way? What is the proper role for commercial outfitters in wilderness? Should hunting and fishing be managed differently inside and outside of wilderness? What should be our policy for non-native fish? What about conflicts between recreation and domestic livestock grazing? These and many other questions call for subjective judgments, and the public should get more involved in those judgments.

Individuals interested in participating in these debates often can do so by contacting a local managing agency. Many wilderness managers have organized citizen task forces to guide planning and management. Another option is to form a new interest group or a committee within an established group for the purpose of developing and promoting wilderness management policies.

A neglected task

Management of wilderness is a complex and difficult task. So far the task has been largely neglected—by the public, by Congress, and by the land management agencies. If the large and diverse wilderness system that has developed since 1964 is to live up to its promise, greater progress is needed to fill in critical information gaps, to make difficult decisions, and to implement new management programs.

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