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Report to the Chairman, Subcommittee
on National Parks and Public Lands,
Committee on Interior and Insular
Affairs, House of Representatives

September 1989

WILDERNESS PRESERVATION

Problems in Some National Forests Should Be Addressed





United States
General Accounting Office
Washington, D.C. 20548

**Resources, Community, and
Economic Development Division**

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The Honorable Bruce F. Vento
Chairman, Subcommittee on National
Parks and Public Lands
Committee on Interior and Insular Affairs
House of Representatives

Dear Mr. Chairman:

This report responds to your request to review the Forest Service's management of its National Wilderness Preservation System lands. Specifically, the report addresses issues regarding the extent of resource deterioration in the wilderness and Forest Service staffing and funding devoted to wilderness management. The report contains several recommendations to the Secretary of Agriculture for improving certain aspects of wilderness management.

We are sending copies of this report to the Secretary of Agriculture; the Chief, Forest Service; the Director, Office of Management and Budget; and various congressional committees. Copies will also be made available to other interested parties upon request.

This work was performed under the direction of James Duffus III, Director, Natural Resources Management Issues, (202) 275-7756. Other major contributors are listed in appendix III.

Sincerely yours,

A handwritten signature in cursive script, appearing to read 'J. Dexter Peach'.

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

According to the Wilderness Act of 1964, wilderness is an area where the forces of nature predominate and people are visitors. However, many human influences have occurred within wilderness areas. Some of this activity is adversely affecting such areas and diminishing the experience of some visitors.

There is concern that the U.S. Department of Agriculture's Forest Service may be devoting only minimal attention to wilderness management despite the growing size and importance of the wilderness system. Therefore, the Chairman, Subcommittee on National Parks and Public Lands, House Committee on Interior and Insular Affairs, asked GAO to review Forest Service management of its portion of the National Wilderness Preservation System. Specifically, the Chairman requested that GAO consider (1) the extent of resource deterioration in wilderness areas and (2) Forest Service funding and staffing devoted to various wilderness management activities.

Background

The Forest Service manages about 32.5 million acres of the National Wilderness Preservation System. Currently, this includes 354 wilderness areas that comprise about 1 acre in 6 of the National Forest System. Forest Service management of wilderness areas is decentralized at the individual national forest and district office levels, with oversight by regional offices and headquarters.

One of the objectives of designating areas as wilderness is to ensure that an increasing population does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition. To accomplish this, the act imposes many restrictions on the use of National Wilderness Preservation System lands.

Among other things, the act generally prohibits or restricts commercial enterprises, permanent roads, and mechanical transport in wilderness areas. However, the Congress recognized recreation as a legitimate purpose of wilderness and allowed certain other uses to continue within individual wilderness areas under special conditions. Among these activities are the operation of commercial outfitting and guide services, development of valid mineral discoveries, livestock grazing, and, in some areas, the use of airstrips and motorboats.

The Wilderness Act authorizes administrative structures or installations within wilderness areas to protect the area and the safety of its users.

However, the structures and improvements should be limited to those actually needed for administration of the wilderness, and they should set a good example for the public. These structures should not diminish the public's feeling of challenge and solitude. Also, although commercial outfitters and guides may establish camps within the wilderness, their structures and facilities should be temporary and compatible with the wilderness environment.

The Forest Service prefers to manage its wilderness areas with as few regulations and restrictions on users as possible while still protecting the wilderness. Education of users on proper wilderness behavior, rather than strict regulatory enforcement, is the preferred Forest Service approach to maintain wilderness areas in their natural condition.

Results in Brief

The full extent of resource deterioration in wilderness areas is not known because information on conditions at many of these areas is lacking. Without baseline inventory information, the Forest Service cannot determine the trend in wilderness conditions. However, GAO visits to wilderness areas, along with the responses of wilderness managers to a GAO questionnaire, indicate that conditions vary widely. While some areas appeared to be in relatively good condition, many areas showed signs of adverse impact, especially on trails and bridges and around popular camping areas.

The presence of some Forest Service administrative sites and outfitter/guide camps have created an atmosphere that can detract from some visitors' sense of solitude and primitive recreational experience. Also, unauthorized and conflicting activities in wilderness areas, such as noise from low-level military training flights, are adversely affecting people's opportunity to enjoy the areas.

The majority of Forest Service wilderness managers told GAO that funding for wilderness management was inadequate in fiscal year 1988, and that staffing is a high priority need. As a result, the Forest Service cannot maintain wilderness area trails, clean campsites, monitor conditions, or educate the public on proper wilderness behavior to the extent that it would like.

Principal Findings

On-the-Ground Conditions

Although many wilderness managers do not maintain comprehensive information on conditions of trails, campsites, or other facilities in wilderness areas, respondents to a GAO questionnaire indicated that there was considerable unmet trail maintenance and reconstruction needs and that campsite deterioration was evident in some areas. GAO-observed problems include erosion, litter, loss of vegetation, and damage by horses. As a result of such deterioration, primarily caused by recreational use, some wilderness areas' ability to provide wilderness values envisioned in the Wilderness Act is reduced. However, because the Forest Service has not periodically inventoried conditions in many of its wilderness areas, it does not know whether conditions are improving or getting worse in these areas.

The Forest Service attempts to maintain low visibility in its wilderness areas to enhance the wilderness experience of visitors, and it expects others using the wilderness to do the same. However, some Forest Service administrative sites, outfitter/guide camps, and other structures or facilities appear to be more extensive than needed to administer the wilderness or provide for recreational opportunities. For example, we visited administrative sites that included up to 16 structures and facilities, including an office/mess hall, blacksmith shop, bunkhouse, and barn.

Funding and Staffing

The Forest Service could not provide GAO with total amounts of funds and staffing devoted to management of individual wilderness areas because, at the present time, it maintains no such accounting by individual areas. However, many Forest Service officials believe that staffing and funding have been inadequate to achieve the objectives set out in their implementation plans. As a result, monitoring, basic data gathering, trail maintenance, campsite cleanup, and education of the public are not performed to the extent that many wilderness managers consider necessary to protect the wilderness.

Recommendations

To improve administration of the National Wilderness Preservation System and to provide the Congress with current and accurate budget information, GAO recommends, among other things, that the Secretary of Agriculture direct the Chief, Forest Service, to

- develop baseline inventory information on the condition of each designated wilderness and monitor changes in the condition and extent of use in wilderness areas;
- evaluate present Forest Service administrative sites to determine whether the structures are the minimum needed to protect the resource and the safety of users and whether they set a proper example for other visitors;
- establish a uniform national policy for dealing with outfitter and guide structures and facilities within wilderness areas that minimizes the presence of such structures; and
- compile information on the total funding and staffing needed to manage individual wilderness areas in a manner that will meet the objectives of the Wilderness Act.

Agency Comments

The views of responsible officials were sought during the course of the work and incorporated in the report where appropriate. However, as requested, GAO did not request official agency comments on a draft of this report.

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Abbreviations

AFMD	Accounting and Financial Management Division
GAO	General Accounting Office
RCED	Resources, Community, and Economic Development Division

Introduction

A congressionally designated wilderness, as defined by the Wilderness Act of 1964 (16 U.S.C. 1131-1136), is an area where the earth and its community of life are untrammelled by people, and where people are visitors. Under the act, a wilderness should retain its primeval character and influence, without permanent improvements or human habitation, and it should be protected and managed so as to preserve its natural conditions. Despite this general operating framework, however, the Congress has authorized many activities—such as recreation, commercial outfitting and guide services, and livestock grazing—that can affect conditions in wilderness areas and the perceptions of visitors seeking to enjoy these areas as pristine, undeveloped lands.

The National Wilderness Preservation System

To keep an increasing population from occupying and modifying all areas within the United States and its possessions, the National Wilderness Preservation System was established by the 1964 act to provide a long-lasting, nationwide system of pristine, roadless, and undeveloped wilderness areas for present and future generations. This system is composed of federal lands in national forests, national parks, national wildlife refuges, and those managed by the Bureau of Land Management in the Department of the Interior. Among the characteristics of these areas are that they

- generally should appear to have been affected by the forces of nature, with the imprint of human beings' work substantially unnoticeable;
- should have outstanding opportunities for solitude or a primitive and unconfined type of recreation;
- should generally have at least 5,000 acres of land or be of sufficient size to make practicable their preservation and use in an unimpaired condition; and
- may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

The Wilderness Act imposes many restrictions on National Wilderness Preservation System lands. With certain exceptions, the act prohibits motorized equipment, structures, installations, permanent roads, commercial enterprises, aircraft landings, and mechanical transport. However, the act permits administrative structures and installations, development of privately owned minerals, access to private lands inside the wilderness area, fire control, insect and disease control, grazing, water resource projects (upon the approval of the President), and recreational use.

The 1964 act designated 54 areas (amounting to about 9 million acres) as wilderness. Subsequently, other legislation has added many other federal land areas to the wilderness system. As of March 1989, the National Wilderness Preservation System included almost 91 million acres. About 34.3 million acres are located in 42 of the contiguous states and Hawaii; the remaining 56.5 million acres are located in Alaska. The Forest Service, in the U.S. Department of Agriculture, manages about 27 million wilderness acres in the contiguous states and about 5.5 million acres in Alaska. This comprises about 1 acre in 6 of the National Forest System. The Department of the Interior's National Park Service, Fish and Wildlife Service, and Bureau of Land Management manage the remaining designated wilderness acreage.

In addition to existing wilderness, it is anticipated that additional wilderness will be designated in the future. Forest Service studies of national forest lands suitable for wilderness designation were initially conducted under a process called the Roadless Area Review and Evaluation. A Roadless Area Review and Evaluation II was conducted under the mandates of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976 (16 U.S.C. 1600-1614). These studies have been subject to various degrees of criticism but have resulted in the addition of many acres of federal lands to the wilderness preservation system.

Forest Service Organizational Structure and Planning for Wilderness Preservation

The Forest Service's oversight and management of wilderness areas are decentralized and are conducted as part of the overall forest planning and management process. Forest Service headquarters in Washington, D.C., provides general oversight for the wilderness program. Each of the Forest Service's nine regional offices develops a regional guide that contains a summary of the regional management situation, including a description of the existing major issues and concerns that need addressing at the regional level to facilitate forest planning. Direct management of the 354 Forest Service wilderness areas, of which 340 are in the contiguous states, is assigned to district offices under the supervision of Forest Supervisors. Many wilderness areas have several districts that have responsibility for managing them. Also, many districts have at least partial responsibility for managing more than one wilderness area.

Specific details and responsibilities for wilderness planning and management are provided in a Forest Service Manual, a Wilderness Management Handbook, and federal regulations. According to federal

regulations, forest planning specifically for the management of wilderness should

- provide for limiting and distributing visitors' use of specific areas in accordance with periodic estimates of the maximum levels of use that allow natural processes to operate freely and that do not impair the values for which wilderness areas were created; and
- evaluate the extent to which wildfire, insect, and disease control measures may be desirable for protection of either the wilderness or adjacent areas and provide for such measures when appropriate.

The Forest Service must develop a land and resource management plan for each unit of the National Forest System. These forest plans should contain (1) a brief summary of the analysis of the management situation, (2) multiple-use goals and objectives that include a description of the desired future condition of the forest or grassland; (3) multiple-use prescriptions and associated standards and guidelines for each management area, including proposed and probable management practices such as a planned timber sale program; and (4) monitoring and evaluation requirements. Implementation of the portion of the forest plan dealing with wilderness is generally accomplished through implementation schedules or plans for projects and activities designed to achieve and comply with Forest Service management standards and guidelines established for the designated wilderness.

The Wilderness Act of 1964 and subsequent legislation, such as Public Law 93-622, which designated 16 new wilderness areas, with some having considerably less than 5,000 acres, recognize recreation and other uses as legitimate purposes of wilderness, and since their designation as wilderness, these lands have been visited by millions of users. Recreation visitor days totaled about 11 million in 1982 and about 13 million in 1987.¹

In protecting the natural condition of wilderness areas, the Forest Service attempts to maximize visitor freedom within the wilderness and minimize direct controls and restrictions. In lieu of strict controls and restrictions, managers try to emphasize information and public education of users as the primary techniques for management of wilderness areas. Managers apply stricter controls on use only when the less restrictive measures have failed. In addition to measuring and sometimes controlling recreational use, Forest Service wilderness managers

¹A recreational visitor day is defined as 12 hours of use by one person.

are responsible for constructing and maintaining trails, bridges, signs, and other facilities, overseeing various types of livestock grazing, and administering commercial outfitter and guide permit programs.

Funding for wilderness management has increased in recent years. In fiscal year 1985, about \$7.7 million was appropriated for Forest Service wilderness management. In fiscal year 1989, this appropriation increased to \$14.7 million. In addition to specifically designated wilderness management funding, other funds, such as trail maintenance funds and forest fire control funds, can also be spent in wilderness areas. Generally, however, funds under these appropriation categories are not accounted for in terms of whether or not they are spent within wilderness boundaries.

Objectives, Scope, and Methodology

Because of concerns that the Forest Service is devoting only minimal resources to the management of wilderness areas, the Chairman, Subcommittee on National Parks and Public Lands, House Committee on Interior and Insular Affairs, requested us to review the Forest Service's management of its wilderness areas. Specifically, the Chairman requested that we consider the extent of resource deterioration in wilderness areas and Forest Service staffing and funding devoted to wilderness management activities.

Because of the large number of individual wilderness areas, we could not visit every wilderness. However, as agreed with the Chairman's office, we visited and gathered detailed information on 10 wilderness areas. (See app. I for a list of the areas we visited, including acreage and years designated.) These wilderness areas include large expanses traversing many national forests, relatively small eastern wildernesses, and wildernesses that contain mining claims, grazing allotments, or outfitter/guide operations.

To obtain a nationwide view of wilderness management, we designed a questionnaire to be mailed to Forest Service district-level wilderness managers. After interviews with wilderness staff to help develop questions, we pretested the instrument at six districts responsible for the management of at least part of a wilderness. From Forest Service headquarters, we obtained lists of all national forests containing wilderness areas, the district ranger offices responsible for managing these wilderness areas, and the names of the wildernesses. Because we were unable to obtain the addresses of the district offices, we mailed questionnaires to 587 districts responsible for the management of wilderness areas

through their Forest Supervisors' offices. We first mailed the questionnaires in March 1989, and after a series of telephone follow-ups, we terminated data collection in June 1989. At that time, we had received responses from 540 districts for a response rate of 92 percent. A copy of the questionnaire is presented in appendix II.

To obtain background information on Forest Service management of wilderness areas, we held extensive discussions with Forest Service headquarters, regional, forest, and district officials involved in wilderness management. In addition, we reviewed Forest Service policies and procedures and individual management plans and implementation schedules for wilderness, and we obtained statistical information on wilderness staffing and funding.

To observe the condition of the 10 selected wilderness areas, we hiked and horsebacked many miles of wilderness trails accompanied by Forest Service officials and other individuals. We photographed various wilderness conditions; some of these photographs are included in this report. We also obtained the views of conservation groups, state officials, and outfitters and guides concerning conditions in wilderness areas and other wilderness-related issues.

We discussed our findings with Forest Service officials and have incorporated their views in this report where appropriate. As requested, however, we did not obtain official agency comments on this report. We conducted our review from May 1988 through August 1989 in accordance with generally accepted government auditing standards.

Recreational and Other Activities Can Adversely Affect Wilderness Areas

Assessing the extent of deterioration and trends in conditions at Forest Service wilderness areas is made difficult by the lack of consistent, comprehensive information on resource impacts and ecological conditions. Although some wilderness managers have detailed information on trail and campsite conditions and various other factors, many other managers have not developed such information.

As our visits to 10 wilderness areas and responses to our questionnaire showed, wilderness areas are different in character, and because of various legislatively authorized activities, not all wilderness areas provide each of the wilderness values—including outstanding opportunities for solitude and primitive recreation—envisioned in the 1964 Wilderness Act. The most frequently occurring problems are associated with recreational overuse. The impacts from recreation are evidenced on trails and around popular campsites or by facilities erected by the Forest Service and commercial outfitters and guides. While not substantially affecting wilderness areas at present, other activities, such as mining, also have the potential to create significant conflicts in the future.

In addition, private and state properties within wilderness boundaries are a concern of Forest Service officials responsible for managing some areas. Noise, especially from low-level military training flights, is a concern in other areas. Also, some wilderness areas have been used for the cultivation of illegal substances, such as marijuana.

The Forest Service Lacks Comprehensive Information on Wilderness Use, Conditions, and Trends

The extent of systematic monitoring of wilderness conditions and visitor use varies considerably among wilderness areas. According to some Forest Service officials, many estimates of wilderness recreational use are so poor that managers cannot use them for planning purposes or even determine whether the use of an area is increasing or decreasing. The lack of monitoring data, combined with the lack of knowledge about the capacity of many wilderness areas to withstand recreational use, creates the potential for overuse. Resource monitoring and basic data collection are high priorities, according to about 68 percent of our questionnaire respondents.

There are methods available to assess changes in wilderness conditions. However, the majority of respondents to our questionnaire indicated that they have not yet implemented the method that is currently being stressed by Forest Service officials for assessing changes in wilderness conditions, but most said that they planned to use it in the future.

Compilation of Condition and Use Information Is Inconsistent

At the wilderness areas we visited, there is considerable variation in the extent to which condition and trend information on wilderness areas and their use is being gathered. For some areas, condition information appears to be detailed and current, whereas for others it is sparse and dated. Information on the trends in wilderness conditions was generally lacking in the areas we visited. Consequently, the Forest Service does not know if conditions are improving or deteriorating. The following examples illustrate the different emphases placed on gathering wilderness condition information at some of the areas we visited:

- Officials in the forest supervisors' offices responsible for managing the Shining Rock, Sipse, and Cohutta Wilderness areas told us that they have not gathered wilderness condition data since before the first area was designated wilderness in 1964, and the other two areas in 1975.
- In the mid-1980s, managers of the Three Sisters Wilderness assessed areas disturbed by campsites. Also, districts that manage portions of this wilderness have inventoried trails and gathered information on their physical condition by mileage location. Trail sign inventories have been completed in most cases. The Trails and Wilderness Technician in one district told us that cultural and ecological inventories would be desirable, but they have not been done to date.
- In the Holy Cross Wilderness, an inventory of conditions at over 1,800 campsites was completed in 1985. In addition, one of the districts that manage the wilderness had started a trail inventory but had only logged the condition of about 8 of the district's 87 miles of trail. Although another district had inventoried trail miles in 1983, inventory data sheets we reviewed contained limited trail condition data. A wilderness recreation official told us that an inventory of private or state properties within wilderness boundaries had been compiled, but he told us that budget constraints prevented completion of other needed inventories, such as those covering cultural resources and vegetation.
- In the Bob Marshall Wilderness Complex in Montana, an inventory of trail construction and reconstruction needs has been completed for the complex. However, the inventory information is based on managers' and others' knowledge of the area rather than on precise on-the-ground measurements. This information is computerized and used to identify priorities for construction and reconstruction projects. Also, inventories of selected campsite conditions have been conducted in the wilderness; these are being updated on an ongoing basis.
- At the Frank Church-River of No Return Wilderness in Idaho, officials told us that there are various categories of inventories for different districts managing the wilderness, including a 1982 historic structures inventory required by the designating act, trails and sign inventories,

and campsite inventories. However, in some cases officials do not have detailed logs on trail condition by location, and have not updated the information since the early 1980s. The eight districts that we visited also varied in the extent to which they had undertaken or completed other inventories, such as those on trail signs, and mining claims.

- District staff who manage the Pecos Wilderness in New Mexico told us they do not have accurate information on resource conditions. They said they need studies that assess trends in trail and campsite conditions, and better information on ecological conditions. For example, they need information on water quality in the wilderness. A district wilderness official told us that managers have only a general knowledge of trail conditions because even though inventories of trail conditions and maintenance needs were done in the past, they are just now beginning to address these problems because they are new to the wilderness. They told us that they need to have accurate information on the trail situation because the Pecos Wilderness has frequent pack animal and cattle use, soil conditions that are difficult to work with, and poor trail placement.

Better Data Needed on Recreational Overuse in Some Wilderness Areas

Achieving the outstanding opportunities for solitude and a primeval, unconfined recreation experience envisioned in the Wilderness Act of 1964 may not be possible in portions of some popular wilderness areas because of overcrowding. The respondents to our questionnaire indicated that overcrowding has at least moderate impact in about 25 percent of the districts. However, about 40 percent of the respondents said that they could not estimate the carrying capacity that any portion of the wilderness in their districts can withstand.

For example, officials who manage the 37,000-acre Cohutta Wilderness in Georgia and Tennessee have not estimated its carrying capacity. Therefore, they cannot be sure whether visitor use, which was about 70,000 recreation visitor days in fiscal year 1988, exceeds the reasonable carrying capacity of the wilderness.

Pecos Wilderness management officials told us that they need a better understanding of use levels and user experience and patterns. For example, to adequately address overuse in some areas they need to have defensible data on which to base decisions to restrict or alter use. Data from a permit system that was discontinued in 1986 are the latest available on public use, but the data are not complete, and officials believe they need better user data to target their educational efforts.

Some Forest Service officials have recognized the need to impose restrictions on visitors to wilderness areas. This is reflected in table 2.1, which shows the extent to which wilderness managers who responded to our questionnaire have found it necessary to impose various types of restrictions on visitors to their areas.

Table 2.1: Types of Restrictions on Visitor Use

Type of restriction	Percentage of yes and no responses for fiscal year					
	1986		1987		1988	
	Yes	No	Yes	No	Yes	No
Length-of-stay limits	43	51	44	50	44	50
Party size limits	54	40	55	39	57	39
Camping restrictions	38	54	40	52	43	51
Pack animal use restrictions	38	53	39	52	40	52

Note: Percentages do not total 100 because some wilderness managers did not respond to this question.

However, not all wilderness managers are limiting visitor use even when they have evidence that their areas' carrying capacities are being exceeded. For example, annual carrying capacity for visitors at the 18,450-acre Shining Rock Wilderness in North Carolina has been estimated by the Forest Service to total 56,100. On the basis of the district's reported estimates of recreation visitor days, visitor use has exceeded the estimated carrying capacity for at least the last 4 years. An official in the forest supervisor's office responsible for coordinating wilderness information went even further in stating that visitor use has exceeded the area's carrying capacity since at least 1980.

Wilderness managers use other means to deal with the problem of overuse. For example, all four of the districts we visited in Oregon's Three Sisters Wilderness said they had crowding at popular areas. The Forest Service's Pacific Northwest Region prepared a Wilderness Solitude Catalog listing 12 crowded areas to avoid in the wilderness. The catalog also has a solitude searchers checklist, and it includes hints on crowded areas to avoid in northwestern wilderness areas.

Limited Use of Methodology to Collect Data on Wilderness Conditions and Trends

Methods are available to assess changes in wilderness conditions, but, as our review indicates, most Forest Service wilderness managers have not implemented the method that currently is being stressed by Forest Service officials to achieve this goal—the Limits of Acceptable Change method. This method involves identifying management concerns; selecting indicators of important wilderness qualities (e.g., wildlife populations, minimal campsite impacts, and solitude); establishing a standard below which the condition of each indicator is unacceptable; and selecting management actions to avoid or correct specific unacceptable conditions, such as creating trail alternatives and modifying use patterns. Public involvement can be an important aspect of this method's implementation in some wilderness areas and may help to ease problems associated with acceptance of management changes in wilderness uses.

The Limits of Acceptable Change method is still evolving. For example, our questionnaire responses indicated that as of September 30, 1988, about 76 percent of the wilderness managers had not applied the method to the management of the wilderness under their control. However, of those not using the method, about 34 percent said they definitely planned to do so in the future, and another 40 percent said they probably would apply it. The other respondents said that they probably would not use the method or that they were undecided.

The method is probably furthest along in the Bob Marshall Wilderness, where implementation started in 1981 and where the method has been generally accepted as an effective management tool. For example, the process has already identified a number of concerns that need to be addressed, including the appropriateness and location of communication and administrative facilities in the wilderness.

Two of the keys to successful implementation of the Limits of Acceptable Change method are the compilation of adequate baseline inventory conditions and continuous monitoring of changing conditions. Only when such information is available can wilderness managers know when established standards are being exceeded and have a basis upon which to undertake corrective actions to ensure high-quality wilderness recreational opportunities or appropriate resource protection measures. Monitoring the condition of wilderness areas can be expensive, making implementation of the method or other similar processes impractical in some areas under current funding and staffing constraints.

Legislatively Authorized Activities Complicate Wilderness Protection

Although legislation established recreation as a legitimate use of wilderness, it is recreational use that is generally regarded as the impetus for many activities and developments that cause most of the resource damage in wilderness areas, and ultimately results in some visitors being unable to enjoy the challenge and solitude offered by a primitive recreational opportunity. Heavy recreational use has contributed to adverse impacts to trails and campsites in many wilderness areas. Also, the need to manage and facilitate this use has led the Forest Service to construct and maintain, or permit, a host of facilities and structures within wilderness areas, including administrative sites and outfitter and guide camps. Some of these facilities and structures appear to exceed the minimum requirements needed to ensure the protection of wilderness resources, protect the safety of visitors, or provide for wilderness experiences that would otherwise not be available to some visitors.

While not a significant issue now, mining rights in some wilderness areas have the potential to create a significant adverse impact on wilderness resources and create conflicts with other wilderness users. For example, the management plan for the Frank Church-River of No Return Wilderness identified over 2,000 mining claims in the wilderness. Grazing can also affect wilderness areas.

Widespread Problems With Trail and Bridge Maintenance

Trail maintenance and improvements were among the highest priorities of respondents to our questionnaire. Deteriorating trails are a common problem in wilderness areas, and large sums of money are invested every year to maintain, relocate, and rebuild trails. However, Forest Service wilderness managers estimate that as of September 30, 1988, there was an unmet trail maintenance and reconstruction need of about \$64 million. New trail construction needs as of that date were estimated at \$16 million. Add to this their estimated \$7 million in bridge maintenance and new construction or renovation needs, and the estimate reaches \$87 million. Trail problems are prevalent throughout the National Forests, a situation we discuss in our report entitled Parks and Recreation: Maintenance and Reconstruction Backlog on National Forest Trails (GAO/RCED-89-182, Sept. 1989).

While most of the trails we traveled in the 10 wilderness areas we visited were cleared of downed trees and passable, we observed numerous areas where gullying and erosion, mud, shortcuts, and multiple trails were evident. Although trail problems can be caused by horse traffic

and severe weather even when the trails are properly located and constructed, Forest Service studies indicate that many miles of existing wilderness trails were built over 50 years ago, before these areas were designated wilderness, to serve needs other than wilderness recreation, such as forest fire control.

According to a study of trails in the Bob Marshall Wilderness Complex, many trails were located to achieve the “shortest distance between two points” and to make construction easy, rather than to provide a particular wilderness recreation opportunity. Many of the problems with wilderness trails can be corrected only by proper location and reconstruction to today’s construction standards, according to the study. If this was accomplished, the wilderness recreation opportunity envisioned in forest management plans could also be achieved.

Some of our observations of trails, bridges, and signs made during visits to 10 wilderness areas are discussed below, and photographs taken during our visits highlight some of the impacts on resources.

Holy Cross Wilderness

We observed considerable trail erosion during our hikes in the Holy Cross Wilderness in October 1988. Sections of some trails traverse rocky areas, and much of the topsoil had been washed off the trails because of the lack of sufficient drainage structures. This resulted in gullies on the steeper trail sections. A recreation staff official told us that while he was aware of the problem, he did not have the resources to prevent the erosion before the topsoil had been washed away. (See fig. 2.1.)

Figure 2.1: Eroded Trail in Holy Cross
Wilderness



Frank Church-River of No
Return Wilderness

According to the management plan for the Frank Church-River of No Return Wilderness, most of the 2,616 miles of trails were constructed for fire protection prior to 1930 and do not meet Forest Service requirements regarding alignment, maximum grade, and clearance. Trail maintenance is usually limited to clearing downed trees, with trail reconstruction done primarily when the trail is impassable. This minimal maintenance effort has caused a general decline of trail conditions. To reduce maintenance costs, some trails have deliberately been allowed to go back to natural conditions. The management plan covering the wilderness assumes that without proper maintenance and emphasis on the relocation and correction of eroded sections, the trail system will continue to deteriorate.

Wilderness management officials at one district told us that trail conditions have not improved since a 1980 trail inventory. The management plan stated that the district's trails could not function at the then current use levels without increasingly contributing to resource deterioration, and that correcting this problem would require heavy construction or relocation efforts. The poor location of many miles of trail often makes erosion control efforts futile. On trail signing, the plan stated that at many trail junctions signs of different eras are in place, sometimes providing duplicate or contradictory information, and other trail junctions have no directional signs or signs that are in a poor state of repair. The Wilderness Forester said that conditions may have deteriorated further in some areas because of limited budgets.

At another district, the staff assistant responsible for trails told us that the staff is updating information on the condition of 605 miles of trail and has determined that some of the trails are in poor condition. The district's 1988 trail reconstruction proposals gave the following examples:

- Twelve miles of trail have virtually disappeared because of soil losses and lack of maintenance. The 12 miles are almost impassable to hikers or horse users and are extremely hazardous to those who try to use them.
- Two other 2-mile segments are dangerous to foot or horse travel because soils and fine rocks have washed out of the trail pads and left only jagged rock exposed. Soil is also washing into the Middle Fork of the Salmon River, degrading water quality. This segment is on steep hillsides, where horses and hikers could slip and fall.

- Numerous trees have been blown down, blocking parts of another 5-mile segment. Portions of this trail have not been maintained for 10 years. Major work is necessary to provide safe travel by horseback or foot.

Pecos Wilderness

According to the Recreation and Lands Staff Officer for the Santa Fe National Forest, about two-thirds of the approximately 1,000 miles of trail, including many in the wilderness, are substandard, but without additional funding, the Forest Service is losing ground in bringing the trails up to standard. During our visit to the Pecos Wilderness, we observed many boggy areas of trail, erosion and gulying, multiple trails, loss of tread, downed trees, inadequate signing, obstructed trails, and nonfunctioning drainage structures. Some of these conditions are depicted in figures 2.2, 2.3, 2.4, and 2.5.

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Figure 2.2: Multiple Trails in Pecos Wilderness



Figure 2.3: Boggy Trail Area With
Nonfunctioning Drainage Structure in
Pecos Wilderness



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Figure 2.4: Bare Tree Roots on Trail Section in Pecos Wilderness



Figure 2.5: Trees Downed on Trail in Pecos Wilderness



Bob Marshall Wilderness

In the Bob Marshall Wilderness Complex, which is composed of the Bob Marshall, Scapegoat, and Great Bear Wildernesses, trail reconstruction needs are significant. According to Forest Service officials, 1,063 miles of trails, representing 45 percent of the total trail system, require some form of construction or reconstruction. They project the cost of completing the on-the-ground work to be between \$5.1 million and \$6.7 million in 1985 dollars. The estimate does not include overhead or planning

costs. If the construction/reconstruction budget averages \$120,000 per year (the budget at the time of the study), the work could take between 43 and 56 years to complete. That timetable clearly poses a problem because the average life of a trail is 20 to 30 years.

According to 1988 program proposals for the Flathead National Forest, in the short term a high rate of investment in maintenance and construction will be needed. Without it, according to these proposals, resource problems, safety hazards, and loss of past investments in trail improvements can be expected. Officials in one of the forests that include portions of the complex told us that the last time a strong emphasis was placed on trails was in the 1930s and a few times following natural disasters. They have tried to maintain the trails with available funding but have been fighting a losing battle, they said.

We observed a variety of trail conditions in the Bob Marshall Wilderness, such as erosion, loss of tread, boggy areas, trail widening, and non-functioning water drainage structures. We also observed trails where, because of the terrain, there was limited or no space to pass oncoming parties. (See figs. 2.6 and 2.7.)

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Figure 2.6: Gullying and Multiple Trail in Bob Marshall Wilderness



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Figure 2.7: Steep Trail Section in Bob
Marshall Wilderness



Campsite Deterioration Is Evident in Some High-Use Areas

About 32 percent of those responding to our questionnaire advised that between October 1985 and September 1988 campsite deterioration had created at least a moderate adverse impact, with 11 percent of the respondents saying it created great or very great deterioration. Almost one-third responded that litter was at least a moderate concern. Also, campsite cleanup or removal was designated one of the higher priorities of about 56 percent of the respondents.

Generally, according to Forest Service policy, campsites should be designated only as a last resort, and existing camps should be relocated or removed to allow maximum opportunity for solitude and to minimize the evidence of human use. However, we observed many areas where continued use over time has resulted in de facto designated campsites. Some wilderness managers encourage camping in areas where significant impacts have already occurred in an attempt to confine the areas of damage. Some of these areas exhibited numerous firerings (open structures for containing fires), litter, tent drainage ditches, and damage from horses that had been tethered to trees. These problems are not always easily resolved because although camping can rapidly affect soils and vegetation in previously unused areas, the restoration process can be lengthy in some sensitive areas.

About 17 percent of the respondents to our questionnaire said that in fiscal year 1988 they closed campsites for various reasons. They said these campsites (1) were closer to shorelines or water sources than allowed by Forest Service policies, (2) were too close to other camping areas, or (3) resulted in unacceptable resource damage. One district that is responsible for managing a portion of the John Muir Wilderness in California reported that 75 campsites were closed because they were too close to water sources. As shown in table 2.2, Forest Service wilderness managers use various fire control measures at wilderness campsites. Some districts use more than one control measure.

Table 2.2: Campfire Control Measures at Respondents' Wilderness Areas

Control measures	Number of respondents
Remove all rock firerings after use	96
Allow one firering to remain per campsite	165
Remove only firerings from "undesirable" campsites (such as off-limit sites, fragile sites, and cross-country zones)	215
Make no attempt to reduce the number of firerings	127
Provide metal fire pits at campsites	9
Allow no campfires in wilderness area	16
Other	49

We observed various forms of deterioration at some popular campsites in the wilderness areas we visited. Firerings, soil impaction, litter, or loss of vegetation were observed in areas of the Sipseey, Shining Rock, Dolly Sods, and Cohutta Wilderness areas. (See fig. 2.8.)

Figure 2.8: Old Tent and Litter at Campsite in Cohutta Wilderness



Conditions at some campsites in the Bob Marshall Wilderness Complex were examined by the Intermountain Forest and Range Experiment Station staff, who reported in July 1983 that large areas had been disturbed and many trees had been damaged. They stated that such damage is primarily a result of the prevalence of large parties with stock and the persistence of practices such as felling trees for tent poles and tying stock to trees. In a 1988 inventory of selected campsites, the Forest Service stated that about 5 percent of the 300 campsites visited exceeded Forest Service standards for barren vegetation.

During our visits, we observed campsite areas that had considerable resource damage. The camping locations near one lake had barren core

areas with firerings, litter, and tree root exposure as a result of horses being tied to the trees. (See fig. 2.9.)

Figure 2.9: Firering and Horses Tethered to Trees at Camping Area Adjacent to a Lake in Bob Marshall Wilderness



At Colorado's Holy Cross Wilderness, a 1985 inventory of over 1,800 campsites disclosed 364 that were damaged enough to require them to be closed or restored. We observed numerous high-impact camping areas at two sites. Many firerings were present at one of the campsites even though the Forest Service had recently dismantled and disbursed them.

Comprehensive campsite data for portions of the Frank Church-River of No Return Wilderness had not been developed. However, the Forest Service was aware of several lakeshore camping areas that have been heavily affected by concentrated use. During our visits to this wilderness, we observed visitors who had tethered their stock in a camping area near an airstrip, even though the Forest Service had erected hitch rails nearby to keep stock out.

According to the management plan for this wilderness, some of the most significant resource damage from recreation use takes place at campsites. Vegetation loss and soil compaction are the most prevalent impacts, but water pollution from stock and human waste are also evident in some heavily used areas. Further, riparian vegetation in meadows and along streambanks is being damaged in high-use sites along the rivers and at popular high mountain lakes. Other problems include numerous firerings, litter, and tent trenching. The plan further states that many campsites are visited and cleaned only once a year, often only once every other year.

In the Pecos Wilderness, at one crossing of the Pecos River, we observed several campsites that were close to the river. According to several Forest Service officials we spoke to, camps should generally be at least 200 feet from water sources. A Forest Service official accompanying us on our visit said that he had instructed his trail cleanup crews to maintain several of the firerings and to obliterate the others in order to try to concentrate use within a few campsite areas along the stream.

Many of the campsites we observed in the Pecos Wilderness had significant amounts of litter. We also saw considerable litter along the trails. At one trash-filled camp, we also observed a tent drainage ditch, which is not considered to be a good low-impact camping technique; a toilet that was very close to the campsite; and some unburied human waste. According to a Forest Service official, the amount of trash strewn about could only have been carried in by horse, a fact confirmed by the disturbed ground where horses had been tethered. (See figs. 2.10, 2.11, and 2.12.)

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Figure 2.10: Litter at Camping Area in Pecos Wilderness



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Figure 2.11: Pack Animal Damage at Campsite in Pecos Wilderness



Figure 2.12: Tent Drainage Ditch at Campsite in Pecos Wilderness



Some Forest Service Structures and Facilities May Exceed Wilderness Administration Requirements

On the basis of our visits to several wilderness areas, it appears that the Forest Service could reduce the impacts at some of its administrative sites. We observed Forest Service administrative sites, some in areas adjacent to authorized airstrips within wilderness boundaries, that included numerous permanent buildings and other accommodations.

Many administrative facilities in wilderness areas were built before the areas were designated and may have performed legitimate functions at the time. However, according to Forest Service policies, its administrative structures and improvements should be the minimum needed to protect the resource and the safety of users and should set the example by which the public and outfitters and guides use the wilderness. Forest Service employees should also consider the effect that the existence of a facility has on the feeling of challenge or risk experienced by Forest Service employees and visitors to the wilderness area.

Although there were no permanent Forest Service structures or facilities within the five relatively small eastern wildernesses we visited, in four of the five larger western wildernesses many such structures were evident. The following discussion highlights the scope of some of the Forest Service structures and facilities in these western wilderness areas.

Frank Church-River of No Return Wilderness

In the Frank Church-River of No Return Wilderness, the Forest Service uses 13 sites for wilderness administration on a regular basis. The structures at some of the larger sites include residences for wilderness rangers, storage sheds, bunkhouses, and corrals. The Frank Church-River of No Return Management Plan recognized the need to evaluate administrative sites to determine if they are all needed for wilderness protection and management.

These administrative sites are usually oriented toward airstrip or river locations to accommodate and monitor heavy recreation use in these areas. For example, one administrative site that we visited in October 1988 includes 12 structures and is located at an airstrip. Recreation users are attracted by the easy access provided by the airstrip. Some of these users do not stray very far from the airstrip, and they camp at a Forest Service campground for extended periods, according to a Forest Service official. We observed semipermanent tent camps that users maintain for fly-in visits.

Another administrative site in the wilderness that is also served by an airstrip has a boat ramp that is heavily used for river boating. (See fig. 2.13.) The airstrip receives as many as 75 landings per day, according to

the wilderness management plan. Because of this heavy use, a decision was made to repair the airstrip using flown-in mechanized equipment to get the job done quickly. The more wilderness-compatible alternative—repairing the strip with primitive tools, such as horse-drawn graders—would have closed the strip for a much longer period than was actually the case. In contrast, on a trail construction project, a Forest Service contract requires hand chiseling of blasting holes in some rocky areas rather than the use of power drills.

Figure 2.13: Forest Service Administrative Site in Frank Church-River of No Return Wilderness



Three Sisters Wilderness

The Forest Service maintains an administrative cabin in the Three Sisters Wilderness to accommodate a wilderness volunteer. The Forest Service believes that the cabin may be a historic structure. There are also

two fire lookouts in the wilderness. Although they are inactive as fire lookouts, the Forest Service maintains them and leaves them unlocked so that wilderness visitors can use them. The Trails and Wilderness Technician said he has no plans to discontinue maintaining these sites. This is despite a provision in the draft plan for the Willamette National Forest, (which includes part of the Three Sisters Wilderness) that states that facilities may be allowed only when needed to attain wilderness objectives, and they should be designed and placed to minimize their intrusion upon the wilderness setting and not be for the comfort or convenience of users. Also, the Forest Service's general policy requires that existing improvements, structures, and facilities that are not essential to the protection of the wilderness resource should be removed.

Bob Marshall Wilderness

Two work centers in the Bob Marshall Wilderness Complex are duty stations for Forest Service personnel. The work centers are also home for field crews on their off days, providing for heat, showers, and storage and refrigeration of perishable goods. In addition, they warehouse equipment and supplies. A corral-barn complex accommodates pack animals and provides staging for daily operations to the field. One work center consists of 16 facilities or structures, including a ranger dwelling, bunkhouse, office/mess hall, blacksmith shop, barn, and others. The other work center is equipped with a telephone line and has a radio system powered by a wet-cell battery that is recharged from solar panels. (See fig. 2.14.)

Figure 2.14: Forest Service Solar Panel in Bob Marshall Wilderness



The Forest Service also maintains 11 guard stations in this wilderness. Fire lookouts are also present in the wilderness but their role has largely been taken over by aircraft patrols. Unlike the situation in the Three Sisters Wilderness, where fire lookouts are available for public use, these facilities are secured and maintained on a limited basis for use in wildland fire and communications support.

Pecos Wilderness

The Forest Service maintains two administrative sites in the Pecos Wilderness. One of these consists of two cabins, a tack and feed shed, and a corral. One of the cabins is used by the Forest Service; the other is used by the New Mexico Game and Fish Department. The site has a water and septic system and uses propane for cooking and lighting. The facilities are used by trail crews and other Forest Service employees working in the wilderness, but they are not permanently staffed during the summer and fall seasons.

Outfitter and Guide Structures and Facilities Are Dispersed Throughout Some Wilderness Areas

Although the Wilderness Act allows commercial services within wilderness areas to the extent necessary to realize the recreational or other wilderness purposes of the areas, the Forest Service and others have become concerned about the size and permanency of some outfitter/guide camps and the proliferation of equipment caches within some wilderness boundaries. Wilderness managers in 132 districts responding to our questionnaire said that they had existing outfitter camps. According to 103 respondents, caches were found in their wilderness areas, and in 3 cases the number of caches exceeded 100.

Outfitting and guide operations are intended to provide the equipment, service, and skills that some segments of the public cannot or do not want to provide for themselves. However, Forest Service policy is to approve only the temporary structures and facilities for outfitter and guide operations necessary to properly meet their public service in a manner compatible with the wilderness environment. Their structures should be located away from main trails, streams, lakes, key interest features, and areas used by other visitors. Despite Forest Service policy, some outfitters have established large camps that include wall tents for cooking and dining, quarters for guest and outfitter staff, stock-holding facilities, and toilet facilities. The size and appearance of these camps vary, but some of them detract from the wilderness experience of visitors and affect the resource, according to several Forest Service officials.

Although there were no outfitter or guide structures or facilities within the eastern wilderness areas we visited, the following discussion and photographs provide evidence of the types of outfitter and guide structures and facilities visitors to some western wilderness areas might encounter.

Frank Church-River of No Return Wilderness

The caching of equipment in the wilderness has once again become an issue with the Forest Service because of activities in the Frank Church-River of No Return Wilderness. Forest Service officials told us that they

have addressed this issue in other areas in the past. Some of the 88 outfitters operating in this wilderness maintain Forest Service-approved base camps that are reserved, posted, and regularly used by the permittee. The large wall tents, corrals, and toilets typically found in these camps are supposed to be dismantled at the end of each season and everything except tent poles taken out of the wilderness. However, some of the hunting camps have been used year after year and have evolved into permanent year-round installations.

A 1987 lawsuit by the Idaho Outfitters and Guides Association regarding the caching of equipment was settled by negotiations that required the Forest Service to establish a task force to address the issue. In December 1988, the task force recommended that all existing caches be removed from this wilderness as required in the management plan for the wilderness. At the time of our review, however, the settlement agreement included a 1-year interim direction for the 1989 season. Details on storing approved material during the off season were to be worked out between each outfitter and the cognizant Forest Service district ranger.

We observed an outfitter's camp on our September 1988 tour of the wilderness. The camp included a large wall tent, corral, and horse equipment tent. We also observed a large wood pile, a horse-drawn wagon, and doghouses. A district wilderness official said the tents had been in place for the last 7 to 10 years. He was concerned with the proximity of the corral to a stream and believed that the firewood had been cut with a chainsaw, which violates wilderness regulations.

At another district involved in managing the wilderness, the Wilderness and Trails Technician said the 1988 forest fires exposed several caches that they had not been aware of before the fires. They plan to cite the outfitters for these caches in their annual evaluation. At another district, we observed the remains of a burned-out outfitter camp that appeared to require a considerable cleanup effort to remove the debris, including a stove, propane tanks, and steel drums. (See fig. 2.15.)

Figure 2.15: Burned-Out Outfitter Camp in Frank Church-River of No Return Wilderness



Bob Marshall Wilderness

During our visit to the Bob Marshall Wilderness, we observed various conditions in outfitter camps, including camps that were (1) relatively large areas where little vegetation remained, (2) close to trails or streams, and (3) small out-of-the-way sites. Forest Service officials told us that they would like to relocate one outfitter camp because of its negative impact on the resource. The camp did not cover a large area, but it was mostly bare of vegetation and close to a stream. We observed litter throughout the camp. (See fig. 2.16.)

Figure 2.16: Outfitter Camp in Bob Marshall Wilderness



Pecos Wilderness

Forest Service officials told us that outfitters operating in the Pecos Wilderness are not managed very intensely. Officials in one district told us that they are supposed to evaluate outfitters' performance annually, but they have not done so in the last 3 years because they have not monitored outfitters' performance in the field. They told us that they do not know the carrying capacity for outfitting, have not been able to monitor

compliance, and do not know the resource impact resulting from outfitter activities. In addition, Forest Service officials said they know that illegal outfitters are operating in the wilderness, but they are not sure how many.

Outfitters' Response

Outfitters we spoke with believe that the use of base camps is the best way to minimize damage to the resource. Without base camps, they believe that resource damage would be spread throughout a wilderness. The base camps do not have to have a major impact on an area: the key is whether or not an area can recover from use, they said. They also told us that new minimum-impact camping materials, such as that used for flooring in tents, have been developed to minimize resource damage.

Other Structures and Facilities Can Be Found in Wilderness Areas

Although the Forest Service's general policy regarding structures and improvements in wilderness areas is to limit them to those needed to protect the resource and the safety of users, other structures—including trail shelters, research project facilities, and Forest Service-acquired properties—might be encountered. For example, in Virginia's James River Face Wilderness, we observed an Appalachian Trail shelter and outdoor toilet facilities. In some cases, toilet facilities are authorized in wilderness areas to protect the resource. Forest Service officials told us that the shelter was authorized to remain in the wilderness under legislation that enlarged the wilderness.

During our visit to the Three Sisters Wilderness, we observed a cabin that the Forest Service considers a nonhistorical and unauthorized structure. The cabin has been "adopted" by local residents, who hold annual rendezvous at the site. Ordinarily, this might not create a major problem; however, the cabin attracts many visitors and concentrates camping impacts in the vicinity of the cabin. (See fig. 2.17.)

Figure 2.17: Nonhistorical Cabin in Three Sisters Wilderness



When we visited the cabin in November 1988, we observed the remains of an unauthorized outdoor toilet and other debris. (See fig. 2.18.) Also, considerable food was stored in the cabin. The District Ranger told us that although the cabin does not have any historical significance, he had no immediate plans to remove it. The draft wilderness plan for the Willamette National Forest stated that other cabins and shelters have been illegally constructed in the wilderness.

Figure 2.18: Remains of Outside Toilet in Three Sisters Wilderness



At another district that manages a portion of the Three Sisters Wilderness, the Disbursed Recreation Manager said four three-sided shelters have been constructed and they are resulting in adverse impacts because of concentrated camping over the years. A decision had not been reached regarding whether they will be removed and, if so, how to proceed with the removal, he said.

At the Frank Church-River of No Return Wilderness, a structures inventory identified 100 structures without historical significance. According to the management plan for the wilderness, most of these will be allowed to deteriorate naturally. Wilderness officials said that in one case the Forest Service paid about \$1.3 million for a multistructure private property to naturalize the area. (See fig. 2.19.) Among the facilities on this property were historical and nonhistorical buildings, a large barn that was housing a bulldozer at the time of our visit, an airstrip, and a hangar. The hangar and several buildings had been removed at the time of our visit; the Forest Service was also considering airlifting some of the other structures, which appeared to us to be in very good condition, out of the wilderness. The bulldozer will eventually be buried near the area, according to Forest Service officials. (See fig. 2.20.)

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Figure 2.19: Nonhistoric Buildings at Forest Service-Acquired Ranch in Frank Church-River of No Return Wilderness



Figure 2:20: Bulldozer Housed in Barn in Frank Church-River of No Return Wilderness



Certain types of research projects are allowed in wilderness areas. However, they too can result in structures being erected and left in the wilderness. For example, while in the Frank Church-River of No Return Wilderness, we observed the remains of an elk enclosure that was erected as part of a research project. (See fig. 2.21.)

Figure 2.21: Remains of Research Impoundment in Frank Church-River of No Return Wilderness



**Impacts of Mining and
Mineral Development
Could Become Severe**

If mining should take place on all of the valid claims located in wilderness areas, it could have a considerable impact. We discuss the potential for mineral development in certain eastern wilderness areas in our report entitled Private Mineral Rights Complicate the Management of Eastern Wilderness Areas (GAO/RCED-84-101, July 26, 1984). As this

report points out, the Forest Service faces considerable potential conflicts in allowing private mineral development while trying to preserve wilderness areas in their natural condition, as intended by the Wilderness Act. Similar problems will be faced by the Bureau of Land Management, which must submit recommendations for additional inclusions to the National Wilderness Preservation System to the President no later than October 21, 1991. We discuss this situation in our report entitled Federal Land Management: Nonfederal Land and Mineral Rights Could Impact Future Wilderness Areas (GAO/RCED-87-131, June 30, 1987).

Generally, wilderness areas are subject to valid existing mining and mineral development rights that allow private property owners to develop their mineral claims. With regard to federally owned minerals in wilderness areas, the act permitted, subject to wilderness protection regulations, mining and mineral leasing activities until December 31, 1983. After that time, no new mineral leases could be issued, but development of issued leases, with their accompanying valid existing rights, could occur, subject to federal controls and regulations.

The Frank Church-River of No Return Wilderness appears to have potential for extensive mining or mineral development. The management plan identified over 2,000 mining claims in this wilderness. There are several mines being developed or considered for development adjacent to the wilderness, indicating the potential for mineral deposits within the wilderness. While no new large-scale mining operations are proposed, there are some existing mining operations in the wilderness. These operations are reached by roads that existed before the wilderness designation, but they were not excluded from the wilderness.

One district wilderness official at the Frank Church-River of No Return Wilderness said that mining had the potential to be the greatest wilderness problem his district faces. One trail in the district's portion of the wilderness is also a miner's access road, setting the stage for conflict between users. The Forest Service also approved a miner's request to reconstruct two bridges to accommodate light trucks. We hiked a portion of the trail and observed old mining equipment along the road. Two other districts also view mining as having the potential to become a major problem if mineral demand increases in the future.

Also, a Special Mine Management Zone, which included about 40,000 acres, was authorized in the Central Idaho Wilderness Act of 1980, which designated the River of No Return Wilderness (subsequently

renamed the Frank Church-River of No Return Wilderness) for exploration and development of cobalt. The exploration and mining of cobalt is considered to be a dominant use of the zone and is allowed subsequent to the December 31, 1983, wilderness mining and mineral development closure. More than 480 cobalt claims are located in this zone. An idle cobalt mine just outside the wilderness is polluting several streams within the wilderness with toxic copper, according to a Salmon National Forest official.

There are no active mining or mineral developments at the Sipse, Cohutta, Shining Rock, Dolly Sods, or James River Face wilderness areas, but all have outstanding mineral rights.

Livestock Grazing Can Cause Adverse Impacts and User Conflict

Generally, managers of the wilderness areas we visited told us that they were not experiencing serious management problems as a result of grazing allotments within the wilderness, but about 20 percent of the respondents to our questionnaire said that grazing had at least a moderate impact within their portion of the wilderness between October 1, 1985, and September 30, 1988.

The Wilderness Act allows the grazing of livestock, where grazing had been established prior to an area's designation as wilderness, to continue, subject to federal regulation. Questionnaire respondents told us that their wilderness areas contain a total of 2,213 grazing allotments, 1,383 of which are for sheep grazing.

The Frank Church-River of No Return Wilderness Management Plan states that the wilderness has limited potential for livestock grazing, but forage is used to some extent by sheep, cattle, recreation livestock, and wildlife. Forage near heavily used recreation areas is often overgrazed by recreation livestock. The Forest Service was checking the extent of the overgrazing in one meadow area at the time of our visit because officials were concerned about its impact on wildlife.

According to a range management official at the Pecos Wilderness, the impact of traditional grazing on the resource has been minimal, primarily because the economics of grazing animals in remote wilderness does not make it attractive for those who wish to make a living at it. He told us that some small areas have been overgrazed, and the cattle have adversely affected trails to some extent. He said user conflicts are a moderate problem because visitors may confront small groups of cattle—usually 6 to 10 and possibly up to 50—on the trails, usually near

watering areas. Forest Service officials at the Carson National Forest said that because of the terrain, cattle use the trail system to move about the wilderness. These officials told us that they try to minimize the conflict by keeping cattle separated from users.

Private and State Property Within Wilderness Can Make Management More Difficult

Private or state lands within wilderness boundaries can complicate Forest Service management of these areas and create user conflicts. Of those responding to our questionnaire, 203 indicated the presence of private or state lands within wilderness boundaries. In about 47 percent of these cases, they said that the presence of such in-holdings was having at least a moderate impact on the difficulty of managing the areas as wilderness.

With regard to state and private lands within wilderness boundaries, the Wilderness Act provides that the state or private owner will have adequate access to the land, including entrance and exit by means that have been customarily used. For example, a private property owner on the Maroon Bells-Snowmass Wilderness in Colorado gained access to it by having the Forest Service open a previously closed road so that he could transport marble from his quarry.

In some circumstances, the management of such lands as wilderness can be facilitated if the government acquires the properties. However, this approach has not been used frequently. We discuss problems and costs associated with acquiring private lands in our report entitled Parks and Recreation: Maintenance and Reconstruction Backlog on National Forest Trails, and in our report entitled Federal Land Management: Nonfederal Land and Mineral Rights Could Impact Future Wilderness Areas, both referred to earlier.

At the Holy Cross Wilderness, the Implementation Plan Team Leader said private lands within the Holy Cross Wilderness represent the greatest potential management problem to the wilderness. Officials at two of the three districts we visited in the Holy Cross Wilderness identified a total of 160 such parcels.

At the time of the 1986 Frank Church-River of No Return Management Plan, there were 72 parcels of nonfederal land within the wilderness boundaries containing 9,600 acres, of which about 2,900 acres were privately owned and the remainder were state-owned. The privately owned parcels were patented as either homesteads or mining claims. Eleven of these parcels are operated to a varying extent as resorts catering to the

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recreation public. Most of these include lodges, barns, cabins, cultivated lawns, and airfields. Other properties are, or may potentially be, developed adversely to wilderness values and objectives.

During our visit, we observed one property within the wilderness boundary that had an airstrip and about 10 cabins alongside it. The occupants had various mechanized equipment, such as a backhoe and all-terrain vehicles. They had also placed a gate and a private property sign across the trail where it passed through the property. Forest Service staff accompanying us on our visit pointed out that some trail relocation will be required to route the trail around the area. (See fig. 2.22.)

Figure 2.22: Private Property Sign Across Trail in Frank Church-River of No Return Wilderness



In West Virginia's Dolly Sods Wilderness, the Forest Service has been negotiating for several years in an attempt to acquire access through an area owned by a private corporation. However, at the time of our fieldwork, it had been unable to acquire ownership or an easement. During our hike in the wilderness, which was led by a volunteer of the American Hiking Society, we were confronted by a no-trespassing sign at one of the main access trails to the wilderness. He told us that visitors use

this trail to enter the wilderness because several convenient parking spaces are provided at a nearby trailhead.

Events Originating Outside Wilderness Sometimes Threaten the Resource

Activities outside wilderness boundaries are also of concern to managers. Although some of the literature on wilderness management indicates that serious adverse impacts to wilderness areas are resulting from various external threats—such as air pollution, water pollution, noise, acid rain, and other forces outside wilderness boundaries—most respondents to our questionnaire did not indicate serious concerns with any of these threats, except for noise. Table 2.3 shows the frequency of some of the threats emanating from outside the boundaries of wilderness areas managed by respondents to our questionnaire.

Table 2.3: Frequency of Off-Site Threats to Wilderness Areas

Off-site threats	Number of respondents indicating extent of threat						
	Very great	Great	Moderate	Some	Little or no	Not present	Cannot judge
Water pollution	3	3	5	34	206	252	35
Air pollution	3	9	44	90	235	72	83
Noise	6	26	63	163	190	58	31
Acid rain	1	11	36	185	100	201	6
Other	1	16	16	12	6	7	6

As can be seen from the table, noise appears to be the most prevalent off-site problem affecting the wilderness, according to Forest Service district managers. This was true at the Pecos Wilderness, where the Forest Service has had some problems with low-flying military aircraft.

The Air Force has a flight path over the Pecos Wilderness that allows flights as low as 100 feet. The Forest Service has discussed the situation with the Air Force, which has cooperated but has pointed out that it needs to have low-level flight training and that it prefers to use lightly populated areas, such as wilderness, for such training. The Forest Service told us that complaints have decreased, although some flights still take place. During our visit to the wilderness, we observed low-flying military fighter aircraft on one occasion.

At the time of our fieldwork, the Forest Service was presenting plans for conducting an assessment of the impacts of aircraft overflights on wilderness resources of the National Forest System, excluding Alaska. The assessment is required by Public Law 100-91, enacted on August 18, 1987.

Forest Service-initiated actions outside the wilderness can also affect the use of wilderness areas. For example, a road recommended in the Shining Rock Wilderness Management Plan was constructed outside the wilderness, and it now contributes to overuse in the wilderness. This paved road ends at a parking lot and promotes access to a 2-mile dirt and gravel road leading to another parking lot at the wilderness boundary. This route was reported by the Forest Service in 1985 to have been taken by over half of all visitors to the Shining Rock Wilderness.

A different type of concern is present in the Bob Marshall Wilderness Complex, where exotic weeds—such as the leafy spurge, spotted knapweed, and Canadian thistle—are being introduced into the wilderness by visitors and their pack animals carrying the plants' seeds. The problem could become greater, and the Forest Service is getting public pressure to deal with it. Because of the sensitivity and seriousness of this issue, the Forest Service has initiated a study of the situation before chemicals are used to control the weed problem. However, Forest Service staff believe that some outfitters are doing unauthorized spraying, which concerns them because they do not know the type of spray being used, the application rates, and the residual impacts.

Another problem introduced into some wilderness areas from outside their boundaries is the cultivation of illegal substances, such as marijuana. Seventy-four districts that responded to our questionnaire indicated that they had discovered such substances were being cultivated within their wilderness boundaries.

Although it is not a widespread problem, according to Forest Service officials, a major external and possibly internal impact on the Holy Cross Wilderness is water project development. A water diversion system, including large pipes, already is in place just outside the Holy Cross Wilderness. A second phase is planned to divert water from the middle of the wilderness, a project that would require diversion structures and conduits to be built within the wilderness boundary. The second phase of the project was being contested by environmentalists at the time of our review, and its future was uncertain. (See fig. 2.23.)

Figure 2.23: Water Collection Pipes at Boundary to Holy Cross Wilderness



Conclusions

The Wilderness Act of 1964 established a National Wilderness Preservation System that should retain a primeval character and influence, without permanent improvements or human habitation, and that should be protected and managed so as to preserve its natural conditions. Many legislatively authorized activities, however, now appear to be damaging the wilderness and diminishing people's enjoyment of portions of these pristine undeveloped lands.

Forest Service officials do not know the full extent of the damage because they have not (1) established baseline inventory data on the

status of these lands, (2) determined if prevailing conditions are acceptable, or (3) periodically monitored conditions and uses to assess changes in conditions.

The Forest Service needs to consider the extent of the damage and take action where necessary to keep it to a minimum. One of the areas where the Forest Service needs to make such a decision concerns its existing administrative structures and facilities. Administrative facilities are allowed under the Wilderness Act of 1964. However, according to Forest Service policy, wilderness managers should attempt to minimize their impact on the wilderness. Therefore, wilderness managers need to assess existing administrative sites to determine the minimum amount and type of facilities needed to efficiently and safely administer the wilderness. Also, allowing public use of trail shelters, fire lookouts, and nonhistoric structures does not conform to the Forest Service's policy requiring that facilities that exist only for the comfort and convenience of the visitors be removed.

Another area that needs to be resolved is the extent to which outfitter and guide facilities and equipment will be allowed in the wilderness. A recent decision by the Forest Service will allow district rangers, in consultation with outfitters in the Frank Church-River of No Return Wilderness, to decide how this issue will be addressed for the 1989 season. This decision is a step toward resolving the problem, but it only addresses the situation at the Frank Church-River of No Return Wilderness. It appears that the treatment of outfitters could be standardized nationwide.

On portions of the trails system and popular camping areas, extensive resource damage is occurring. Trails need better maintenance, and many trail segments need to be reconstructed or relocated. For example, at the Bob Marshall Wilderness, if funding were to remain at historical trail construction/reconstruction levels, the total job could take more than 30 years to complete, which may be longer than the useful life of the trails.

The Limits of Acceptable Change method for identifying management concerns and overall management direction for wilderness areas is being stressed by Forest Service officials; successful implementation of this method will depend on identifying the indicators that are used to determine the resource condition and then adequately monitoring these indicators to determine the condition and trend of the resource. However, this process is still evolving, and it may not be practical for implementation in all wilderness areas at the present time. We believe,

however, that some baseline inventory information and accurate statistics on use need to be developed for each designated wilderness area so that management can assess trends in resource condition and use. This information could be used by the Forest Service to initiate changes in the manner in which wilderness is used, and it would likely be more acceptable to users as a basis for restricting certain uses.

Extensive private and state lands within some wilderness areas can create management problems over which the Forest Service has little control. While minerals exploration and mining in the wilderness are presently being done on a small scale, these activities could escalate if mineral demand increases. Because there are thousands of valid existing mineral rights within wilderness boundaries, mining has a high potential to adversely affect wilderness resources.

Although most wilderness managers did not believe that their areas were seriously affected by off-site environmental problems (such as air and water pollution), many areas reported experiencing problems with noise, especially from low-level military flights. Some areas also must deal with exotic weeds and the cultivation of illegal substances.

Recommendations to the Secretary of Agriculture

To improve administration of the National Wilderness Preservation System, we recommend that the Secretary of Agriculture direct the Chief, Forest Service, to

- develop baseline inventory information on the condition of each designated wilderness and monitor changes in the condition and extent of use in wilderness areas;
- consider the applicability of the Limits of Acceptable Change method or other methods to assess changes in wilderness conditions;
- evaluate present Forest Service administrative sites to determine whether the structures (1) are the minimum needed to protect the resource and the safety of users and (2) set a proper example for other visitors to the areas; and
- establish a uniform national policy for dealing with outfitter and guide structures and facilities within wilderness areas that minimizes the presence of such structures in keeping with the spirit of the Wilderness Act.

Adequacy of Funding and Staffing to Manage Wilderness Areas

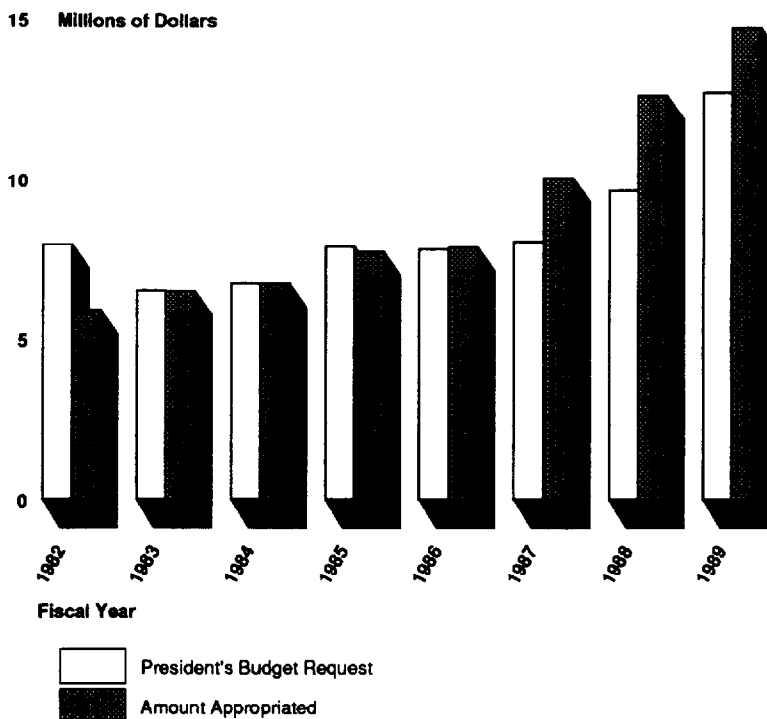
As our questionnaire results and the comments of wilderness managers showed, funding and staffing for managing the Forest Service National Wilderness Preservation System are high priorities. Seventy-six percent of the Forest Service officials responding to our questionnaire indicated that funding for wilderness management was either generally inadequate or very inadequate. Although for the past 4 years annual appropriations for Forest Service wilderness management have exceeded amounts requested in the President's budget, they have not been sufficient to attain the initiatives set out in several forest plans for wilderness management.

A shortfall is also indicated in Forest Service staffing devoted to wilderness management. Wilderness managers assign a high priority to staff-intensive needs, such as education, contacts with the public, and resource monitoring. They believe such activities are critical to achieving and maintaining good wilderness conditions. Because both volunteer and paid Forest Service staff are lacking to implement education, resource monitoring, and other programs, these important activities are often not performed.

Funding Has Not Permitted Full Compliance With Wilderness Plan Initiatives

According to the majority of Forest Service officials responsible for managing wilderness, funding was generally or very inadequate in fiscal year 1988. Figure 3.1 shows wilderness management appropriations for fiscal years 1982 to 1989 compared with the amounts requested in the President's budget.

Figure 3:1: Wilderness Management Funding Requests and Appropriations, Fiscal Years 1982-89



The funding levels in figure 3.1 show a steady increase in appropriations over the past 8 years. However, there has also been a substantial increase in the acreage of designated wilderness during this period. For example, in fiscal year 1983 there were 179,000 acres of wilderness in Forest Service Region 8, and it received \$301,000; in 1984, with 525,000 acres, the region received \$270,000; in 1988, with 642,000 acres, the region received \$928,000. These dollar levels represent funding per wilderness acre of \$1.68, \$0.51, and \$1.45, respectively. Region 8 officials estimate that a total of \$1.86 million is needed in annual wilderness management funding to fully implement the wilderness management initiatives included in regional forest plans. On a national scale, as we discussed in chapter 2, unmet needs for bridge and trail maintenance and construction totaled \$87 million at the end of fiscal year 1988.

Under the Forest Service's present accounting system, the total costs and funding associated with managing Forest Service wilderness cannot be precisely calculated. Part of the problem is that all costs associated with management activities undertaken in wilderness areas are not charged to the wilderness management account. For example, costs associated with trail maintenance in wilderness areas are charged to the

trail maintenance account, but trail work is not segregated by whether it is within or outside the wilderness boundary.

The Forest Service is presently engaging in system design work that would address this problem. For example, during fiscal year 1990, the Forest Service will be testing a new system that will depict the costs associated with wilderness management. These costs include those for operations, coordination, administration, maintenance, and a pro rata share of the construction costs of trails and other facilities devoted to wilderness areas.

In addition to the Forest Service's lack of financial data on a program basis, charges to the wilderness management account may not have accurately reflected work that was actually performed within wilderness, but may have more accurately reflected the amount of work that was planned. We discuss this issue and the Forest Service's experiment with a new budget system that would more accurately reflect Forest Service charges in our report entitled Forest Service: Evaluation of "End-Results" Budgeting Test (GAO/AFMD-88-45, Mar. 31, 1988).

In addition, the Forest Service does not program and budget wilderness management funding by individual wilderness areas. Consequently, a district's budget shows the amount of wilderness management funding budgeted for managing all wilderness areas in that ranger district. If a district has more than one wilderness, the budget would not show the amount budgeted to manage each individual wilderness. For example, the Pisgah Ranger District, which manages the Shining Rock Wilderness and one other wilderness, receives one budget for wilderness management. The district's budget does not show the amount allocated for specifically managing the Shining Rock Wilderness but rather includes both areas.

Notwithstanding the problems in accounting for costs and expenditures by specific wilderness, several managers expressed concerns over inadequate funding. For example, the team leader for the Holy Cross Implementation Plan said that funding has not been adequate to carry out a sound wilderness program. Funds have been shifted from other programs just to keep high-use trails maintained. He estimated that present funding levels would permit only a 40- to 60-percent level of compliance with the wilderness implementation plan. One District Wilderness For-ester said inadequate funding and staffing are the greatest problems facing her portion of the wilderness, resulting in limited education and enforcement programs and resource damage from improper uses.

Several district officials for the Frank Church-River of No Return Wilderness told us their budgets and staff are too limited to adequately manage their portion of the wilderness. For example, the district responsible for managing the largest portion of the wilderness requested about \$165,000 more than was eventually allocated during fiscal years 1985 to 1987.

Forest Service officials who manage the portion of the Bob Marshall Wilderness in the Lewis and Clark National Forest told us that their forest plan reflects funding needs that would meet the plan's objectives. However, they rarely receive the amounts in the plan, they said. They can allocate the funds they receive any way they like, but they must stay within the constrained amount. They told us that the situation regarding wilderness funding may improve, since one of the current Forest Service's regional and forest emphases is wilderness management.

Additional Staffing Is a Priority in Many Wilderness Areas

Additional wilderness field staff was a high priority for about 72 percent of the wilderness managers responding to our questionnaire. Staff-intensive activities—such as education of and contacts with the public, campsite cleanup and removal, trail maintenance and improvement, and monitoring resources and basic data collection—were among the highest priorities identified by the wilderness managers as not being met. As with funding, it is not possible to determine the total staff time devoted to wilderness management. Most Forest Service officials who have management responsibility for wilderness areas spend only a portion of their time on wilderness-related activities. The remainder of their time is spent on other National Forest activities.

Of the wilderness managers responding to our questionnaire, 130 stated that, in fiscal year 1988, no paid staff in the positions of seasonal wilderness rangers, other seasonal staff, full-time district level staff, or permanent part-time district level staff were involved at least 10 percent of their time in on-the-ground wilderness management matters. Also, 390 district wilderness managers responded that, to the best of their knowledge, no one in the responsible forest supervisors' offices spent at least 10 percent of their time involved in the on-the-ground management of wilderness areas during fiscal years 1986 to 1988.

Also, the Forest Service is heavily dependent on volunteers to do wilderness work. We discuss Forest Service use of volunteers for trail construction and maintenance in our September 1989 report on Forest

Service trails. However, the Forest Service relies on volunteers to provide other wilderness services as well. For example, they may act as trailhead hosts or wilderness rangers, collect trash, inventory wildlife and plants, and perform other activities. At the Three Sisters Wilderness, the Chief, Deschutes National Forest Recreation Staff, estimated that about 70 percent of one district's wilderness management is done by volunteers. However, volunteers do not come without cost because they need training and supervision, and determining where and how they will be used requires planning time. Also, some volunteers receive per diem pay for the time they are in the wilderness.

A district official at the Pecos Wilderness told us that he could use and obtain more volunteers, but he does not have paid Forest Service staff to support the volunteer program beyond what is already occurring. He told us that his staff has already spent uncompensated overtime helping the volunteer program work. Also, officials in one district told us that they have problems with trail maintenance in part because the trail maintenance crews have a high turnover. During the past 4 years, they have had a different person in charge of the trail crew each year. The trail crews also receive only limited training, and they have other collateral duties.

Conclusions

As responses to our questionnaire and comments of Forest Service managers in the field indicate, inadequate funding and staffing for wilderness management have resulted in low-level implementation of many programs. Long-term, increased funding and staffing, if appropriately applied, could improve the condition and management of the wilderness resource. However, these increases will be likely to require some difficult choices on the part of the Congress and the administration.

Currently, the Forest Service cannot provide precise amounts of funding spent on individual wilderness areas, but several officials said that funding provided has not been sufficient to meet forest plan initiatives. Also, estimated needs for trail and bridge maintenance and construction far exceed current available funding levels. With the potential for increases in the number and size of wilderness areas, the Forest Service needs to assess, on a forest-by-forest basis, its wilderness and other funding needs to determine whether it will be able to manage such areas in a manner that will prevent further deterioration.

**Recommendation to
the Secretary of
Agriculture**

To improve administration of the National Wilderness Preservation System and provide the Congress with current and accurate budget information, we recommend that the Secretary of Agriculture direct the Chief, Forest Service, in conjunction with the development of baseline inventory information on the condition of individual wilderness areas, to compile information on the total funding and staffing needed to manage wilderness areas in a manner that will meet the objectives of the Wilderness Act.

Chapter 3
Adequacy of Funding and Staffing to Manage
Wilderness Areas

Wilderness Areas Visited

Wilderness area/location	Number of acres	Year(s) designated
Frank Church-River of No Return, Idaho	2,361,767	1980
Bob Marshall, Montana	1,009,356	1964, 1978
Holy Cross, Colorado	122,037	1980
Pecos, New Mexico	223,333	1964, 1980
Three Sisters, Oregon	285,202	1964, 1978, 1984
Sipsey, Alabama	25,906	1975, 1988
Cohutta, Georgia/ Tennessee	37,042	1975, 1986
Shining Rock, North Carolina	18,450	1964, 1984
James River Face, Virginia	8,903	1975, 1984
Dolly Sods, West Virginia	10,215	1975

GAO Questionnaire

United States General Accounting Office



Survey of U.S. Forest Service Management of Wilderness Areas

The U.S. General Accounting Office (GAO) is conducting a review of the Forest Service's management of wilderness areas. The following questionnaire is being sent to all District Rangers responsible for some or all parts of a designated wilderness area. GAO has also recently surveyed Forest Supervisors about the management of the trail system in national forests. This is a related but separate congressional request.

- Using available information and your professional judgment please complete this questionnaire for the wilderness area listed on the label at the bottom of the page. Please return it within 10 days using the enclosed self-addressed business reply envelope.
- If you are responsible for more than one wilderness area, you will be asked to complete more than one questionnaire so that conditions on each wilderness area will be represented in our results.
- If you are responsible for only a segment of a wilderness area, please complete the questionnaire for your segment only.

If you have any questions about the questionnaire, please contact Edward Niemi at (202) 634-6360 or FTS 634-6360. If the business reply envelope is missing or misplaced, please return the questionnaire to:

U.S. General Accounting Office
Attn: Edward Niemi
Room 4476
441 G Street, NW
Washington, DC 20548

Thank you for your assistance.

WILDERNESS AREA:

(Attach copy of mailing label here.)

**Appendix II
GAO Questionnaire**

NOTE: This section asks you background information about overall planning and management issues.

1. What is(are) the name(s) of the Forest Land and Resource Management Plan(s) in which this wilderness is included? *(Enter name(s))* (10)
2. As of September 30, 1988, had a specific implementation schedule for the referenced wilderness been completed? *(Check one)*
 - 1. Yes 30.4%
 - 2. No 67.4%
 - Missing 2.2%
3. As of September 30, 1988, have Limits of Acceptable Change (LAC) been applied to the management of the referenced wilderness in your district? *(Check one)*
 - 1. Yes —————→ *SKIP TO Q.5* 20.0%
 - 2. No —————→ *GO TO Q.4* 76.1%
 - 3. Don't know —————→ *SKIP TO Q.5* 3.5%
 - Missing 0.4%

4. To the best of your knowledge, are there any plans to adopt the LAC management approach to the referenced wilderness in your district? *(Check one)* (10)
 - 1. Definitely yes 34.3%
 - 2. Probably yes 40.4%
 - 3. Probably no 14.8% N=411
 - 4. Definitely no 0.2%
 - 5. Don't know 9.7%
 - Missing 0.5%
5. As of September 30, 1988, have photographs of the wilderness area (excluding air quality monitoring) been taken in your district to monitor resource change in the wilderness? *(Check one)* (11)
 - 1. Yes 31.5%
 - 2. No 67.2%
 - Missing 1.3%
6. As of September 30, 1988, how many Forest Service districts were involved in managing the wilderness? *(Enter number)* (12-13)

Mean=2.3 Number of districts

NOTE: The following section asks you to provide information on the types of activities, facilities, or equipment found in the wilderness including those that have been specifically authorized by law or regulation.

7. In fiscal year 1988 how many times, if any, did the following occur in the portion of the wilderness within this district? *(Check one for each)* All numbers are expressed as percents. (14-18)

	Never (1)	1-10 times (2)	11-25 times (3)	26-50 times (4)	51-100 times (5)	Over 100 times (6)	No basis to judge (7)	Missing
1. Use of motorized or mechanized vehicles and/or equipment (e.g., chainsaws, snowmobiles, bicycles, etc.)	20.9	46.5	11.9	5.0	2.8	5.0	6.7	1.3
2. Use of air transport (e.g., helicopters, airplanes)	50.7	29.3	3.3	2.4	1.3	3.7	4.8	4.4
3. Use of private access roads	76.5	11.7	2.0	1.1	0.4	0.9	2.2	5.2
4. Use of caches	70.6	15.9	1.7	0.6	0.4	0.6	5.7	4.6
5. Other nonconforming uses <i>(Please specify)</i>	25.9	8.1	1.5	0.4	0.7	0.7	3.1	59.4

Note: The number of respondents (N) equals 540 unless otherwise noted throughout App. II.

Appendix II
GAO Questionnaire

8. As of September 30, 1988, which of the following nonconforming activities, if any, were specifically allowed in this wilderness by: 1) the legislation that enacted this wilderness, or 2) in the Wilderness Act of 1964? (Check all that apply)

21.5%	1. <input type="checkbox"/> Motorized vehicles and/or equipment (chainsaws, snowmobiles, boats)	(19-20)
22.0%	2. <input type="checkbox"/> Air transport (helicopters, airplanes)	
20.7%	3. <input type="checkbox"/> Mining	
47.4%	4. <input type="checkbox"/> Grazing	
10.7%	5. <input type="checkbox"/> Private access roads	
4.1%	6. <input type="checkbox"/> Caches	
8.0%	7. <input type="checkbox"/> Other nonconforming activities (Please specify)	

29.6% 8. Nonconforming activities not allowed

9. As of September 30, 1988, which of the following facilities, if any, existed legally or illegally in the portion of the wilderness within this district? (Check all that apply)

19.6%	1. <input type="checkbox"/> Toilets	(27-34)
24.4%	2. <input type="checkbox"/> Outfitter camps	
36.1%	3. <input type="checkbox"/> Permanent shelters, campsites, or caches	
5.4%	4. <input type="checkbox"/> Airfields/Heliports	
16.9%	5. <input type="checkbox"/> Water impoundments	
3.9%	6. <input type="checkbox"/> Electric transmission facilities	
11.5%	7. <input type="checkbox"/> Scientific data collection facilities	
20.4%	8. <input type="checkbox"/> Other nonconforming facilities (Please specify)	

10. As of September 30, 1988, did any state or private in-holdings exist in the portion of the wilderness within this district? (Check one)

37.6%	1. <input type="checkbox"/> Yes	(38)
61.7%	2. <input type="checkbox"/> No → SKIP TO Q. 12	
0.7%	Missing	

11. In your opinion, to what extent, if any, does the overall presence of state or private in-holdings increase the difficulty of managing the portion of the wilderness within your district? (Check one)

1. <input type="checkbox"/> Very great extent	11.3%	(39)
2. <input type="checkbox"/> Great extent	12.8%	
3. <input type="checkbox"/> Moderate extent	22.7%	N=203
4. <input type="checkbox"/> Some extent	21.7%	
5. <input type="checkbox"/> Little or no extent	28.6%	
Missing	3.0%	

12. During fiscal year 1988 how many outfitter/guides, if any, operated in the portion of the wilderness within this district? (Enter number; if none, enter 0)

Mean=3.8 Outfitter/Guides (37-40)

13. During fiscal year 1988 how many grazing allotments, if any, existed for each of the following types of animals in the portion of the wilderness within this district? (Enter number; if none, enter 0)

Mean=1.3 Cattle

Mean=3.7 Sheep

Mean=0.1 Horses

Mean=0.5 Recreational stock

Mean=0.5 Others (Please specify) (41-46)

14. Between October 1, 1985 and September 30, 1988, how many grazing allotments, if any, were terminated in the portion of the wilderness within this district? (Enter number; if none, enter 0)

Mean=0.1 Number of terminated grazing allotments (48-50)

15. Between October 1, 1985 and September 30, 1988, how many grazing allotments, if any, were added in the portion of the wilderness within this district? (Enter number; if none, enter 0)

Mean=0.0 Number of added grazing allotments (70-73)

Appendix II
GAO Questionnaire

16. Is current mining in this wilderness area subject to the provisions of the Mining Act of 1872? (Check one)

- | | | |
|---------------------------------|-----------------|-------|
| 1. <input type="checkbox"/> Yes | 48.9% | (74) |
| 2. <input type="checkbox"/> No | → SKIP TO Q. 19 | 45.4% |
| Missing | | 5.7% |

17. As of September 30, 1988, to the best of your knowledge, how many patented and unpatented mining claims, if any, existed in the portion of the wilderness within this district? (Enter number for each; if none for either enter 0; if no unpatented claims skip to Q. 20)

Mean=1.9	Number of existing patented mining claims	
Mean 23.7	Number of existing unpatented mining claims	(27-14)
N=264		

18. As of September 30, 1988, how many of the existing unpatented mining claims in the portion of the wilderness within this district, if any, were still active? (Enter number; if none, enter 0)

Mean=6.2	Number of active claims	
SKIP TO Q. 20		(18-18)

19. As of September 30, 1988, what was the status of the mineral rights in the portion of the wilderness within this district? (Check all that apply)

- | | | |
|------------------------------------------------------|-------|---------|
| 1. <input type="checkbox"/> Outstanding | 13.8% | (19-20) |
| 2. <input type="checkbox"/> Reserved | 20.4% | |
| 3. <input type="checkbox"/> Third party | 11.6% | |
| 4. <input type="checkbox"/> Owned by U.S. government | 77.3% | |
| 5. <input type="checkbox"/> Other (Please specify) | 7.2% | |

N=181

20. As of September 30, 1988 how many sites in the portion of the wilderness within this district, if any, were eligible for or were listed on national registers of historical or archeological sites? (Enter number; if none, enter 0)

Mean=4.9	Number of historical or archeological sites	(24-27)
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21. Between October 1, 1985 and September 30, 1988, how many wildlife habitat projects, including fisheries, if any, were approved in the portion of the wilderness within this district? (Enter number; if none, enter 0)

Mean=0.2	Number of habitat projects	(28-31)
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22. Between October 1, 1985 and September 30, 1988, how many watershed restoration projects, if any, were approved in the portion of the wilderness within this district? (Enter number; if none, enter 0)

Mean=0.1	Number of watershed projects	(32-36)
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23. Between October 1, 1985 and September 30, 1988, how many cloud seeding projects, if any, were approved in the portion of the wilderness within this district? (Enter number; if none, enter 0)

Mean=0.0	Number of cloud seeding projects	(37-38)
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24. Between October 1, 1985 and September 30, 1988, how many areas of illegal substance cultivation, if any, were discovered in the portion of the wilderness within this district? (Enter number; if none, enter 0)

Mean=0.5	Number of illegal substance cultivation areas	(40-43)
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Appendix II
GAO Questionnaire

NOTE: The following section asks you to provide information about measuring visitor use, use patterns, and resource degradation.

25. Has the amount of visitor use been estimated or measured in the portion of the wilderness within your district between October 1, 1985 and September 30, 1988? (Check one)

1. Yes 80.6%
 2. No → SKIP TO Q. 29 18.3%
 Missing 1.1%

(44)

26. To the best of your knowledge, to what extent, if any, were the following methods used between October 1, 1985 and September 30, 1988 TO ESTIMATE OR MEASURE VISITOR USE in the portion of the wilderness within this district? (Check one for each) All numbers are expressed as percents.

(48-51)

N=435

	Very great extent (1)	Great extent (2)	Moderate extent (3)	Some extent (4)	Little or no extent (5)	Missing
1. Permits	11.3	3.9	2.8	4.6	57.7	19.8
2. Register at trailheads	11.0	13.3	11.0	10.1	38.6	15.9
3. Sign-in along the trails	1.4	1.6	2.5	6.2	62.3	26.0
4. Mechanical counters/electric counters	2.5	2.8	6.4	13.1	54.5	20.7
5. Sampling or counting along trails by rangers	9.0	9.7	20.9	29.7	20.0	10.8
6. Sampling or counting by trailhead hosts	1.8	2.5	4.4	11.0	57.9	22.3
7. Other (Please specify)	3.2	4.6	7.1	8.0	7.6	69.4

27. How many recreation visitor days (RVDs) were recorded in the portion of this wilderness within your district in fiscal years 1986 through 1988. (Enter number; if none, enter 0)

Mean=21,132.6
 FY 1986: _____ RVDs Median= 6,100.0
 Mean=22,173.6
 FY 1987: _____ RVDs Median= 5,650.0
 Mean=22,641.2
 FY 1988: _____ RVDs Median= 5,970.0

N=435

(52-72)

Appendix II
GAO Questionnaire

28. In the portion of the wilderness within your district during fiscal year 1988, what percent of total RVDs occurred in each of the following three month periods? (Enter percent, if none, enter 0)

Estimated % of Total Use N=435

Mean= 5.7% January through March

Mean=17.6% April through June

Mean=57.3% July through September

Mean=21.4% October through December
100%

29. As of September 30, 1988, had a formal evaluation or assignment of carrying capacity ever been made for any part of the wilderness? (Check one)

- 1. Yes 27.2%
- 2. No 72.6%
- Missing 0.2%

30. As of September 30, 1988, which of the situations listed below best describes the current status of carrying capacity for the portion of this wilderness in your district? (Check one)

- 14.3% 1. Carrying capacity limits have been established for all users for the entire wilderness
- 2.8% 2. Carrying capacity limits have been established for all users for some areas in the wilderness
- 18.7% 3. Though no formal limits have been established, approximate capacity limits are estimated for the more heavily used areas of the wilderness in the district
- 40.4% 4. We are presently unable to estimate capacity for any portions of this wilderness in this district
- 8.5% 5. Carrying capacity limits have been established for some, but not all, users for some or all areas in the wilderness
- 14.1% 6. Other (Please specify)
- 1.3% Missing

31. Is the carrying capacity referred to above currently used as a management tool for this wilderness in your district? (Check one)

- 1. Yes 33.0%
- 2. No 63.1%
- Missing 3.9%

32. In your opinion, during fiscal year 1988 about what percent of the visitors to the portion of the wilderness in this district were educated about minimum impact camping by paid or volunteer forest staff? (Check one)

- 1. NONE → SKIP TO Q. 34 14.8%
- 2. 1-20% 52.0%
- 3. 21-40% 15.4%
- 4. 41-60% 10.4%
- 5. 61-80% 5.2%
- 6. 81-100% 1.5%
- Missing 0.7%

33. As of September 30, 1988, which of the following methods, if any, were used to educate any visitors to this wilderness area in your district? (Check all that apply) N=456

- 1. Direct contact with staff in the National Forest 91.7%
- 2. Bulletin board 79.6%
- 3. Pamphlets/brochures 84.4%
- 4. Permit requirements 23.5%
- 5. School/Community contacts 43.2%
- 6. Media 40.4%
- 7. Other (Please specify) 11.8%

Appendix II
GAO Questionnaire

NOTE: The following section asks you to provide information about management techniques used to affect visitor use patterns. "Use-rationing" refers to limiting the total number of users in the referenced wilderness. "Redistributing" use refers to dispersing visitors to preferred areas in the referenced wilderness.

34. To the best of your knowledge, was visitor use of this wilderness area controlled (as directed by either policy or regulation) through any of the following methods during fiscal years 1986 through 1988? (Check one for each method and each year) All numbers are expressed as percents. (30-44)

	FY 1986		FY 1987		FY 1988	
	Yes (1)	No (2)	Yes (1)	No (2)	Yes (1)	No (2)
1. Length of stay limits	43.0	51.1	43.5	49.6	44.3	50.4
	5.9	Missing	6.9	Missing	5.4	Missing
2. Party size limits	53.5	40.4	54.8	38.7	56.7	38.5
	6.1	Missing	6.5	Missing	4.8	Missing
3. Camping restrictions	38.1	54.1	40.4	51.9	42.6	50.9
	7.8	Missing	7.8	Missing	6.5	Missing
4. Packstock use restrictions	38.0	53.3	38.7	51.9	39.6	52.4
	8.7	Missing	9.4	Missing	8.0	Missing
5. Provided or withheld information on wilderness area	32.6	55.9	34.8	53.5	36.3	53.5
	11.5	Missing	11.7	Missing	10.2	Missing
6. Other (Please specify)	9.4	6.5	10.0	6.3	10.2	5.9
	84.1	Missing	83.7	Missing	83.9	Missing

Appendix II
GAO Questionnaire

35. During fiscal year 1988, did forest staff improve or impede use of trails (i.e., rerouted or built new trails) as a way to control visitor access in the portion of the wilderness within this district? (Check one)

1. Yes → SKIP TO Q. 37 29.8% (48)
 2. No 69.8%
 Missing 0.4%

36. When was the last fiscal year, if ever, forest staff improved or impeded use of trails as a way to control visitor access in the portion of the wilderness within this district? (Enter year; if never, enter 00)

For those that have
 Fiscal Year 19 ____ the median=1986 (48-47)

37. During fiscal year 1988, was the availability of any facilities such as toilets, hitch rails, or fire rings within the portion of the wilderness in this district changed (including opening new facilities, or moving or closing existing facilities) to help direct visitor use? (Check one)

1. Yes 25.4% (48)
 2. No 73.7%
 Missing 0.9%

38. During fiscal year 1988, was the availability or quality of any facilities, such as trail heads or parking lots, outside the wilderness changed (including opening new facilities, or moving or closing existing facilities) to help direct visitor use of the portion of the wilderness area within your district? (Check one)

1. Yes 25.7% (48)
 2. No 73.1%
 Missing 1.1%

39. Were any camping areas closed in the portion of the wilderness within this district during fiscal year 1988? (Check one)

1. Yes 17.2% (50)
 2. No → SKIP TO Q. 41 81.7%
 Missing 1.1%

40. How many campsites in the portion of the wilderness within this district were closed in Fiscal Year 1988 for the following reasons? (Enter number; if none, enter 0)

- Number of Campsites N=93
 Mean= 1.1 Too close to other campsites
 Mean=18.7 Too close to shoreline or water sources
 Mean= 6.5 Resource damage
 Mean=13.9 Other (Please specify) (51-48)

Appendix II
GAO Questionnaire

41. As of September 30, 1988, which, if any, of the following wilderness users in this district were required to obtain use permits? (Check all that apply) ⁽⁸⁷⁻⁷⁴⁾
- 47.0% 1. No permits required —————→ SKIP TO Q. 43
 - 3.7% 2. All users of the area
 - 7.6% 3. Overnight campers
 - 0.6% 4. Day hikers
 - 14.4% 5. Groups
 - 48.3% 6. Outfitters/Guides
 - 4.1% 7. Motor vehicle users (including snowmobiles and power boats where allowed)
 - 6.9% 8. Other users (Please specify)

42. During fiscal year 1988, by which of the following means could users of the portion of the wilderness in this district obtain their permits? (Check all that apply) ⁽⁷⁸⁻⁷⁹⁾

N=284

- 1. Mail 54.6%
- 2. Telephone 25.4%
- 3. In-person without prior reservation 56.7%
- 4. External ticket outlets (e.g., Ticketron) 0.4%
- 5. Other (Please specify) 35.6%

43. In each of the following months, how many calendar days were Forest Service employees on patrols that included checking for compliance with regulations or permits in the portion of the wilderness within this district? (Enter number of calendar days)

Mean= 4.5 October, 1987

Mean= 0.7 January, 1988

Mean= 1.5 April, 1988

Mean= 10.0 July, 1988 (47-14)

44. Compared with the number of days Forest Service employees were on patrol in the portion of the wilderness within this district three years ago, on the whole, how much more or less are Forest Service employees on patrol now? (Check one) ⁽¹⁸⁾

- 1. Much more 8.5%
- 2. Generally more 22.4%
- 3. About the same 54.6%
- 4. Generally less 9.4%
- 5. Much less 1.9%
- Missing 3.1%

45. Between October 1, 1985 and September 30, 1988, how many of each of the following sanctions have been initiated against violators of wilderness rules and regulations in your district? (Check one for each) ⁽¹⁶⁻¹⁸⁾

	Never (1)	1-25 times (2)	26-50 times (3)	51-100 times (4)	101-250 times (5)	Over 250 times (6)	Missing
1. Warning notices or Notices of Violation	35.4%	55.9%	4.6%	1.7%	0.9%	0.6%	0.9%
2. Permit suspension or revocation	85.9%	5.6%	0.0%	0.0%	0.0%	0.0%	8.5%
3. Criminal prosecution or fines	64.3%	30.0%	0.7%	0.4%	0.2%	0.0%	4.4%

Appendix II
GAO Questionnaire

46. Between October 1, 1985 and September 30, 1988, how much impact, if any, have each of the following results of wilderness use had in the portion of the wilderness within this district? (Check one for each) (10-21)
All numbers are expressed as percents.

	Very Great Impact (1)	Great Impact (2)	Moderate Impact (3)	Some Impact (4)	Little or no impact (5)	Not Present in area (6)	Unable to judge (7)	Missing
1. Overcrowding	3.3	7.0	14.4	22.8	29.4	20.4	1.9	0.7
2. Crime	0.4	1.5	2.2	14.8	54.3	18.1	7.6	1.1
3. Soil compaction and erosion	0.9	7.0	19.8	32.2	31.3	5.4	2.4	0.9
4. Litter	0.6	6.1	23.1	38.1	26.9	2.8	1.5	0.9
5. Trail deterioration	2.0	12.2	24.4	30.7	20.9	6.9	2.2	0.6
6. Campsite deterioration	1.9	9.1	21.1	30.9	26.7	8.0	1.9	0.6
7. Water pollution from on-site sources	0.6	1.5	6.5	20.2	44.3	17.8	8.7	0.6
8. Human waste	1.3	3.3	11.9	23.9	49.6	4.3	5.2	0.6
9. Wildlife disturbance (excluding legal hunting)	0.4	2.0	6.1	19.1	57.6	7.0	5.7	2.0
10. Vegetation disturbance	0.7	6.3	15.6	27.8	40.9	5.7	1.9	1.1
11. Livestock/packstock over grazing	2.4	4.8	12.4	22.4	30.6	24.5	2.2	0.9
12. User conflicts	0.7	2.4	12.6	30.6	42.8	8.1	2.0	0.7
13. Other (Please specify)	2.0	2.0	1.3	1.5	0.9	1.3	0.7	90.2

47. Between October 1, 1985 and September 30, 1988, how much impact, if any, have each of the following results of off-site forces had in the portion of the wilderness within this district? (Check one for each) (28-30)
All numbers are expressed as percents.

	Very Great Impact (1)	Great Impact (2)	Moderate Impact (3)	Some Impact (4)	Little or no impact (5)	Not Present in area (6)	Unable to judge (7)	Missing
1. Water pollution from off-site sources	0.6	0.6	0.9	6.3	38.1	46.7	6.5	0.4
2. Air pollution	0.6	1.7	8.1	16.7	43.5	13.3	15.4	0.7
3. Noise	1.1	4.8	11.7	30.2	35.2	10.7	5.7	0.6
4. Acid rain	0.2	0.0	2.0	6.7	34.3	18.5	37.2	1.1
5. Other (Please specify)	0.2	3.0	3.0	2.2	1.1	1.3	1.1	88.1

Appendix II
GAO Questionnaire

48. To what extent, if any, did user conflicts occur in the portion of the wilderness within this district during fiscal year 1988? (Check one)

- | | | |
|-------------------------------------------------|-------|------|
| 1. <input type="checkbox"/> Very great extent | 0.6% | (27) |
| 2. <input type="checkbox"/> Great extent | 2.4% | |
| 3. <input type="checkbox"/> Moderate extent | 14.6% | |
| 4. <input type="checkbox"/> Some extent | 34.4% | |
| 5. <input type="checkbox"/> Little or no extent | 47.8% | |
| Missing | 0.2% | |
- SKIP TO Q. 50

49. From the list below, please check the two groups (either legal or illegal) that were most in conflict with each other in the portion of the wilderness within this district during fiscal year 1988? (Check two)

- | | | |
|----------------------------------------------------------------------------|-------|---------|
| 1. <input type="checkbox"/> Outfitters/Guides | 11.7% | (38-42) |
| 2. <input type="checkbox"/> Cattlemen | 19.2% | |
| 3. <input type="checkbox"/> Hikers/Campers (General) | 53.1% | |
| 4. <input type="checkbox"/> Hikers/Campers (Accompanied by pets) | 5.7% | |
| 5. <input type="checkbox"/> Hikers/Campers (Not accompanied by pets) | 6.0% | |
| 6. <input type="checkbox"/> Cross-country skiers | 2.5% | |
| 7. <input type="checkbox"/> Snowmobilers | 3.5% | |
| 8. <input type="checkbox"/> ORV/ATV users | 7.8% | |
| 9. <input type="checkbox"/> Non-power boaters | 2.2% | N-281 |
| 10. <input type="checkbox"/> Motor boaters | 1.8% | |
| 11. <input type="checkbox"/> Hunters | 10.6% | |
| 12. <input type="checkbox"/> Miners | 1.1% | |
| 13. <input type="checkbox"/> Horseback riders | 27.7% | |
| 14. <input type="checkbox"/> Members of the armed forces | 0.4% | |
| 15. <input type="checkbox"/> Aircraft operators (military or non-military) | 7.1% | |
| 16. <input type="checkbox"/> Environmental groups | 5.7% | |
| 17. <input type="checkbox"/> Other users (Please specify) | 10.0% | |

**Appendix II
GAO Questionnaire**

NOTE: The following section asks you to provide information about the condition of trails and bridges within the wilderness.

50. As of September 30, 1988, how many miles of trail, if any, lie in the portion of the wilderness within this district?
(Enter number of miles)

Mean =58.8
Median=25.0 miles

(60-66)

51. To what extent, if any, would you place the trail degradation that occurred in the portion of the wilderness within this district during fiscal year 1988 under each of the following classifications? (Check one for each factor) (67-73)
All numbers are expressed as percents.

	Very great extent (1)	Great extent (2)	Moderate extent (3)	Some extent (4)	Little or no extent (5)	Cannot judge (6)	Missing
1. Gullying	2.4	8.1	21.9	27.8	30.0	5.0	4.8
2. Sheet erosion	1.5	4.1	10.6	26.7	45.6	6.5	5.2
3. Trail widening	1.1	5.6	15.6	24.6	42.8	5.0	5.4
4. Short cutting switchbacks	0.7	6.1	16.3	32.2	35.0	4.4	5.2
5. Multiple trailing	1.3	5.9	15.7	24.4	42.0	5.2	5.4
6. Tread compaction	0.7	5.4	15.6	31.7	34.4	5.7	6.5
7. Other (Please specify)	2.2	5.6	6.7	1.1	1.3	2.0	81.1

52. To what extent, if any, was trail degradation caused by each of the following factors in the portion of the wilderness within this district during fiscal year 1988? (Check one for each factor)

All numbers are expressed as percents.

(74-79)

	Very great extent (1)	Great extent (2)	Moderate extent (3)	Some extent (4)	Little or no extent (5)	Cannot judge (6)	Missing
1. Use by hikers	1.9	9.4	12.4	32.4	33.9	4.3	5.7
2. Use by horses	3.7	10.6	21.5	22.0	30.9	4.1	7.2
3. Weather	4.8	14.1	23.3	28.1	18.0	5.2	6.5
4. Vandalism	0.2	0.6	1.9	6.5	70.4	9.1	11.5
5. Other (Please specify)	4.6	6.5	5.2	3.9	1.7	1.9	76.5

**Appendix II
GAO Questionnaire**

53. To what extent, if any, has insufficient maintenance contributed to trail degradation in the portion of the wilderness within this district during fiscal year 1988? (Check one)

- 1. Very great extent 9.4%
- 2. Great extent 16.7%
- 3. Moderate extent 27.6%
- 4. Some extent 24.4%
- 5. Little or no extent 18.5%
- Missing 3.3%

(76)

54. Please estimate the number of miles, if any, and the total cost of trail maintenance and reconstruction needs as of September 30, 1988, in the portion of the wilderness within this district? (If none, enter 0)

Mean =40.1
Median=15.0 Miles
Mean =129,021.4
\$ Median= 20,000.0

(57-22)

55. During fiscal year 1988, how many miles of trails, if any, and at what cost, were maintained or reconstructed to current design standards in the portion of the wilderness within this district? (If none, enter 0)

Mean =23.6
Median= 5.0 Miles
Mean =14,089.2
\$ Median= 4,000.0

(23-38)

56. Between October 1, 1985 and September 30, 1988, how many miles of trails, if any, and at what cost, were maintained or reconstructed to current design standards in the portion of the wilderness within this district? (If none, enter 0)

Mean =48.1
Median= 9.0 Miles
Mean =30,810.3
\$ Median= 9,000.0

(38-54)

57. Please estimate the number of miles, if any, and the total cost of new trail that need to be constructed as of September 30, 1988, in the portion of the wilderness within this district? (If none, enter 0)

Mean =3.2
Median=0.0 Miles
Mean =42,171.0
\$ Median= 8,000.0

(56-70)

58. Between October 1, 1985 and September 30, 1988, how many miles of new trail, if any, and at what cost were constructed in the portion of the wilderness within this district? (If none, enter 0)

Mean =0.4
Median=0.0 Miles
Mean =4,808.3
\$ Median= 0.0

(17-22)

59. Between October 1, 1985 and September 30, 1988, how many new bridges, if any, (excluding puncheons) and at what cost were constructed in the portion of the wilderness within this district? (If none, enter 0)

Mean =0.2
Median=0.0 Bridges
Mean =6,566.5
\$ Median= 0.0

(23-38)

60. Please estimate the number of bridges, if any, (excluding puncheons) that are in need of repair and the total cost of those repairs as of September 30, 1988, in the portion of the wilderness within this district? (If none, enter 0)

Mean =0.7
Median=0.0 Bridges
Mean =9,899.3
\$ Median=0.0

(38-54)

61. Please estimate the number of bridges, if any, (excluding puncheons) that need to be constructed and the total cost of new bridge construction needs as of September 30, 1988, in the portion of the wilderness within this district? (If none, enter 0)

Mean =0.5
Median=0.0 Bridges
Mean =14,648.1
\$ Median= 0.0

(56-70)

**Appendix II
GAO Questionnaire**

NOTE: The following questions concern the forest fire management and campfire policies used in the referenced wilderness.

NOTE: The following section asks you to provide information on the numbers and training of staff involved in management of the referenced wilderness.

62. As of September 30, 1988, was there a specific policy governing the management of forest fires within the portion of the wilderness in this district? (7)
(Check one)

- 1. Yes 78.1%
- 2. No 21.3%
- Missing 0.6%

63. As of September 30, 1988, which of the following techniques, if any, were used to manage forest fires for the portion of the wilderness area in this district? (72-79)
(Check all that apply)

- 39.4% 1. Lightning-caused fires allowed to burn under certain conditions
- 55.7% 2. All fires are suppressed upon detection
- 2.0% 3. Controlled fires started by FS personnel
- 20.2% 4. Restrictions on wood fires
- 5.9% 5. Other (Please specify)

64. During fiscal year 1988, which of the following means, if any, were used to control the visual impacts of campfires in the wilderness? (77-12)
(Check all that apply)

- 17.8% 1. All rock fire rings are to be removed after use
- 30.6% 2. Allow one fire ring to remain per campsite
- 39.8% 3. Only remove fire rings from "undesirable" campsites (such as off-limit sites, fragile sites, cross-country zones, etc.)
- 23.5% 4. Make no attempt to reduce the number of fire rings
- 1.7% 5. Provide metal fire pits at campsites
- 3.0% 6. Allow no campfires in wilderness area
- 9.1% 7. Other (Please specify)

65. How many people in each of the following paid staff positions, if any, spent at least 10% of their time involved in the on-the-ground wilderness management in this district in each of the following fiscal years? (Enter number for each year) (14-37)

Means	FY		
	1986	1987	1988
1. Seasonal wilderness rangers	0.8	1.0	1.2
2. Other seasonal staff	1.0	1.2	1.4
3. Full-time district level staff	0.7	0.8	0.8
4. Permanent part-time district level staff	0.2	0.3	0.3

**Appendix II
GAO Questionnaire**

66. To the best of your knowledge, how many people in the Forest Supervisor's Office, if any, spent at least 10% of their time involved in the on-the-ground wilderness management during each of the following fiscal years? (Enter number)

Mean=0.2 FY 1986

Mean=0.3 FY 1987

Mean=0.3 FY 1988

(38-43)

67. During fiscal year 1988 were any volunteers utilized for the management or upkeep of the portion of the wilderness within your district? (Check one)

(44)

- 1. Yes 61.3%
- 2. No → SKIP TO Q. 71 38.0%
- Missing 0.7%

68. During fiscal year 1988 how many days, if any, did volunteers fill each of the roles listed below for the portion of the wilderness in your district. (Enter number below)

If any volunteers have ever filled these roles for the portion of the wilderness in your district, in what fiscal year were volunteers first used in each role? (Enter years below) (48-74)

	N=331		
	Number of days in FY '88	Year started	
1. Wilderness rangers		1984	= Median
2. Trash pick-up		1984	= Median
3. Trail maintenance and construction	Not usable due to response problems	1984	= Median
4. Trail head hosts		1984	= Median
5. Wildlife/Plant inventory		1984	= Median
6. Other (Please specify)		1985	= Median

69. As of September 30, 1988, what kind of wilderness education or experience, if any, is required of any of volunteers prior to their acceptance for work in the portion of the wilderness in your district? (Check all that apply)

(75-78)

- 9.1% 1. Wilderness education required
 - 20.8% 2. Wilderness recreational experience required
 - 65.3% 3. None required
 - 13.9% 4. Other (Please specify)
- N-331

Appendix II
GAO Questionnaire

70. During fiscal year 1988, in which of the following time periods, if any, were volunteers used in the portion of the wilderness within this district? (Check all that apply) N=331

- 1. October through December 17.8%
- 2. January through March 13.0%
- 3. April through June 50.8%
- 4. July through September 87.0%
- 5. Not used 1.2%

71. During fiscal year 1988, how many full-time, permanent part-time, and seasonal employees, if any, spent at least 10% of their time enforcing regulations in the portion of the wilderness within this district? (Enter number for each type)

Mean=0.6 Full-time employees
Mean=0.2 Permanent part-time employees
Mean=1.2 Seasonal employees

(12-20)

72. As of September 30, 1988, to what extent were each of the following means of training in wilderness management available to district wilderness staff? (Check one for each means) (21-24)

	Very great extent (1)	Great extent (2)	Moderate extent (3)	Some extent (4)	Little or no extent (5)	Missing
1. On-the-job training	17.2%	26.9%	23.3%	20.9%	10.7%	0.9%
2. Formal Forest Service training	0.2%	12.2%	31.1%	35.2%	20.0%	1.3%
3. External training from other agencies or academia	1.3%	4.4%	11.9%	25.7%	50.9%	5.7%
4. Others (Please specify)	0.4%	0.4%	0.4%	2.0%	5.2%	91.7%

**Appendix II
GAO Questionnaire**

73. As of September 30, 1988, was wilderness management a critical element for any wilderness staff member's employee evaluation ratings in your district? (Check one)

- 1. Yes 27.8%
- 2. No 70.6%
- Missing 1.7%

NOTE: The following questions relate to funding for wilderness activities.

74. How much funding was appropriated strictly for management of the portion of this wilderness in your district for fiscal years 1986 through 1988? If your district was responsible for more than one wilderness but only received one overall wilderness appropriation please pro rate the share that would have gone to this wilderness. (Enter amounts for each year)

\$ _____ FY 1986	Mean =188,516.5
	Median= 3,500.0
\$ _____ FY 1987	Mean =188,979.6
	Median= 4,680.0
\$ _____ FY 1988	Mean =182,215.4
	Median 6,000.0

75. Other than the wilderness appropriation, how much money was spent by your district during fiscal year 1988 for projects in the portion of the referenced wilderness within your district? (Enter amount)

Mean =20,890.3
\$ Median= 1,000.0 (50-67)

76. In your opinion, how adequate or inadequate was funding for managing the wilderness in your district to acceptable standards during fiscal year 1988? (Check one)

- 1. Very adequate 1.7% (58)
- 2. Generally adequate 12.6%
- 3. Neither adequate nor inadequate 8.9%
- 4. Generally inadequate 46.9%
- 5. Very Inadequate 29.4%
- Missing 0.6%

**Appendix II
GAO Questionnaire**

77. If more money was available to help manage the portion of the wilderness in your district, please rate the priority, with a 7 being the highest priority and a 1 being the lowest priority, you would give each of the following activities? (*Check one for each*) All numbers are expressed as percents. (50-70)

	Lower priority			Higher priority				Missing
	1	2	3	4	5	6	7	
1. Trail maintenance and improvement	4.6	2.6	3.5	9.6	16.5	25.2	35.2	2.8
2. Trail construction (new trails)	25.7	18.3	15.9	14.6	7.6	8.1	7.8	1.9
3. Surveillance/Law enforcement	3.1	12.2	17.2	21.1	23.1	13.5	8.3	1.3
4. Education and contacts with the public	0.4	1.5	2.6	10.9	21.9	29.6	32.4	0.7
5. Campsite clean-up or removal	3.3	5.6	11.9	21.3	25.9	20.9	9.6	1.5
6. Signing	3.5	9.4	16.9	16.1	22.8	17.2	11.9	2.2
7. Monitoring resources and/or basic data collection	1.5	3.3	10.2	15.2	24.3	23.1	21.1	1.3
8. Research	22.8	24.1	17.6	18.1	8.5	2.8	1.5	4.6
9. Additional wilderness personnel	3.3	3.5	5.9	14.1	17.8	20.4	33.3	1.7
10. Additional administrative personnel	25.2	22.8	15.7	13.9	9.1	6.7	3.3	3.3
11. Land/mineral right/right-of-way acquisition	45.9	15.6	5.0	10.7	5.0	4.6	8.9	4.3
12. Other (<i>Please specify</i>)	0.0	0.0	0.0	1.3	2.4	3.7	9.6	83.0

District Ranger:

_____ Name
 _____ Mailing address

 (____) _____ Telephone number

Forest Supervisor:

_____ Name
 (____) _____ Telephone number

Today's date: ____/____/____

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