

GAO

Report to the Ranking Minority Member,  
Subcommittee on National Parks,  
Forests, and Lands, House Committee on  
Resources

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August 1996

# NATIONAL PARK SERVICE

## Activities Within Park Borders Have Caused Damage to Resources



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1921 - 1996





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

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

B-272312

August 23, 1996

The Honorable Bill Richardson  
Ranking Minority Member  
Subcommittee on National Parks,  
Forests, and Lands  
Committee on Resources  
House of Representatives

Dear Mr. Richardson:

Conditions in the national parks are deteriorating. In our 1995 report on the future of the park system, we documented the declining state of services for visitors to the parks, as well as the degradation of many natural, cultural, and historic resources in the park system.<sup>1</sup> Overall, National Park Service officials estimate that the agency needs more than \$4 billion to perform needed maintenance and properly develop the national park system.

Among the challenges facing the national park system are threats that have damaged or have the potential to damage the parks' natural or cultural resources. These threats can originate either outside of or within park boundaries. Threats that originate outside of a park are termed external threats and include such things as the sound of airplanes flying overhead or the sight of urban encroachment, both of which can disrupt the solitude of remote parks. Threats that originate within a park are termed internal threats and include such activities as heavy visitation, vandalism, looting, or the growth of nonnative plant or animal species that degrade a park's resources. Preventing or mitigating these threats and their impact is at the core of the agency's mission to preserve and protect the parks' resources.

The Park Service has long been concerned about the threats to the resources under its jurisdiction. In 1980, it completed its first comprehensive assessment of the threats facing resources throughout the park system and reported that significant and demonstrable damage was occurring. Since then, we and others have reported on the increasing significance of threats to the parks' resources. Most recently, in 1994, we reported on the scope and effects of external threats to the parks. Among other things, we reported that the Park Service lacked the data needed to

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<sup>1</sup>National Parks: Difficult Choices Need to Be Made About the Future of the Parks (GAO/RCED-95-238, Aug. 30, 1995).

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assess the types and severity of the external threats and the extent of the damage that such threats were causing to the parks' resources.<sup>2</sup>

This report responds to your request that we review internal threats to the parks' resources. It complements our 1994 report and completes our review of the Park Service's management of threats. As you requested, to parallel our work on external threats, the report addresses (1) the information the Park Service is developing on the number and types of internal threats, (2) the relative severity of the damage these threats have caused, (3) the change in the severity of these threats over the past decade, and (4) the actions taken by the Park Service to mitigate them.

As agreed with your office, we limited our work to case studies of eight units in the park system—four national parks, a historical park, a military park, a national lakeshore, and a national recreation area. Although the particular units that were selected may not be representative of the entire national park system, they illustrate its diversity in terms of size, type, and geographic location.

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## Results in Brief

While the Park Service does not have a national inventory of the threats to the parks' resources, individual park units may have resource management and other databases that contain information on the threats. Specific information on the number and types of threats facing the parks is not generally consolidated in the parks or nationally. Without systemwide data on the threats to the parks' resources, the agency is not fully equipped to meet its mission of preserving and protecting these resources.

Park managers have, however, acquired knowledge of the threats to individual parks through their professional training and experience. Cultural and natural resource managers at the eight parks we studied identified 127 internal threats that directly affected the parks' resources. Most of these threats fell into one of five categories: the impact of private inholdings or commercial development within the parks, the impact of nonnative wildlife or plants on native species or other resources of the parks, the damage caused by illegal activities such as poaching, the routine wear and tear on the parks' resources stemming from visitors' daily use of the parks, and the unintended adverse effects of the agency's or park managers' actions (e.g., the accumulation of undergrowth because of past decisions to suppress naturally caused fires, which could result in a more

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<sup>2</sup>National Park Service: Activities Outside Park Borders Have Caused Damage to Resources and Will Likely Cause More (GAO/RCED-94-59, Jan. 3, 1994).

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serious fire). Overall, the park managers said that the most serious threats facing the parks were shortages in three areas—staffing, funding, and resource knowledge. While the managers emphasized these as threats, we classified them as indirect ones because, according to the managers, the insufficiencies in these areas caused many of the conditions now directly threatening the parks’ resources. This report focuses on the conditions that directly threaten resources.

In the eight parks we reviewed, the managers said that more than 80 percent of the 127 direct threats have already caused more than minor damage to the parks’ resources. The relative severity of the damage caused by various types of threats ranged from temporary to permanent. For example, cultural resources such as historic rock art or other archeological resources have suffered more permanent damage than natural resources in many areas. While much of the damage to cultural resources is irreversible, the damage to natural resources, such as native vegetation or wildlife, is not as likely to be permanent, according to the park managers.

The majority (77 of 127) of the direct internal threats to resources, such as the impact of increased visitation and the threat of more serious fires, have worsened over the past decade, according to the park managers. About one-fourth (34) of the threats remained about the same, and most of the rest have diminished. The managers said, however, that their ability to accurately judge trends in severity was limited because they lack baseline data on the condition of the parks’ resources.

The managers at the eight parks we studied reported that some action has been taken to mitigate 104 of the 127 direct internal threats to resources. Many parks have studied the threats to develop ways to address them. Mitigation measures implemented have generally been limited to such actions as closing trails to reduce erosion, installing more rugged equipment to reduce vandalism, and posting signs to inform visitors of the damage resulting from inappropriate activities.

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## Background

In the 124 years since the first national park, Yellowstone, was created, the national park system has grown to include 369 park units. In all, these units cover more than 80 million acres of land, an area larger than the state of Colorado. The mix of park units is highly diverse and includes more than 20 types; these range from natural resource preserves encompassing vast tracts of wilderness to historic sites and buildings in large urban

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areas. The Park Service's mission is twofold: to provide for the public's enjoyment of these parks and to protect the resources so that they will remain unimpaired for the enjoyment of future generations.

The Park Service's 1980 survey of threats<sup>3</sup> found not only that the parks' resources were being harmed but also that improvements were needed in determining what cultural and natural resources existed in each park, what their condition was, and how and to what extent they were being threatened. In response, the Park Service called for the development of resource management plans to identify the condition of each park's resources and the problems with managing them, including significant threats. Three times since 1987, we have reported that the Park Service has made limited progress in meeting the information and monitoring needs it had identified in 1980.<sup>4</sup> Our findings included incomplete, out-of-date, or missing resource management plans and an incomplete inventory of threats, their sources, or mitigating actions.

In 1994, after examining the external threats to the parks, we recommended that the Park Service revise its resource management planning system to identify, inventory, categorize, and assign priorities to these threats; describe the actions that could be taken to mitigate them; and monitor the status of the actions that had been taken. Such an inventory has not been implemented, according to Park Service headquarters officials, because of funding and hiring freezes that have prevented the completion of needed changes to the planning system's guidelines and software. In commenting on a draft of this report, the Park Service said that implementing this recommendation is no longer appropriate. The Park Service's comments and our evaluation are presented in the agency comments section of this report.

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## Internal Threats to Park Resources Are a Continuing Problem

For internal, as for external threats, the Park Service has limited systemwide information. It does not have a national inventory of internal threats that integrates information it already has, and many of its individual units do not have a readily available database on the extent and severity of the threats arising within their borders. However, in commenting on this report, Park Service officials told us that headquarters has the systemwide information it needs to make decisions and that many

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<sup>3</sup>State of the Parks - 1980: A Report to the Congress, National Park Service, U.S. Department of the Interior (May 1980).

<sup>4</sup>In addition to the 1994 and 1995 reports cited earlier, we also issued Parks and Recreation: Limited Progress Made in Documenting and Mitigating Threats to the Parks (GAO/RCED-87-36, Feb. 9, 1987).

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decisions are made at the park level, where the superintendents decide what information is needed. They added that rather than developing a database of threats to resources, they need better data on the condition of resources to allow park managers to identify those that are the most threatened.

According to headquarters officials, the Park Service has developed systems focused on particular categories of resources. Park managers and headquarters staff use these systems to identify, track, or assess problems, resource conditions, or threats. An overview of these systems follows:

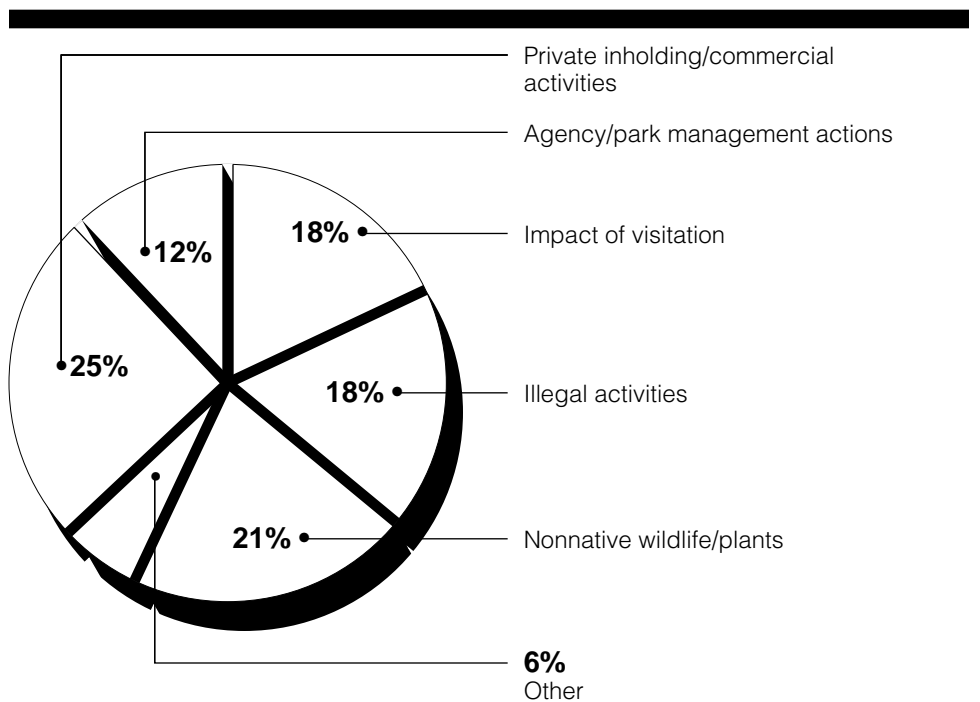
- The Museum Collections Preservation and Protection Program requires parks to complete a checklist every 4 years on the deficiencies in the preservation, protection, and documentation of their cultural and natural resource collections. An automated system is being developed to collect these data. The data are used to make funding decisions.
- Another system for monitoring the condition of a cultural resource is the List of Classified Structures, which inventories and gives general information on historic structures in the parks. Headquarters officials said that the list is not complete because of insufficient funding.
- Headquarters rangers report that automated systems are in place to track illegal activities in parks, such as looting, poaching, and vandalism, that affect cultural and natural resources.
- Headquarters officials report that the inventory and information on the condition of archeological resources, ethnographic resources, and cultural landscapes are poor at present but that there are plans to develop improved systems, if staffing and funding allow.

Although the Park Service's guidance requires the parks to develop resource management plans, it does not require the plans to include specific information on the internal and external threats facing the parks. Such information would assist managers of the national park system in identifying the major threats facing parks on a systemwide basis, and it would give the managers of individual parks an objective basis for management decisions.

### Threats Identified by Managers at the Eight Parks We Reviewed

At the eight parks studied,<sup>5</sup> the managers identified 127 internal threats that directly affected natural and cultural resources. Most of these threats fell into one of five broad categories: the impact of private inholdings or commercial development within the parks, the results of encroachment by nonnative wildlife or plants, the damage caused by illegal activities, the adverse effects of normal visits to the parks, and the unintended adverse effects of the agency’s or park managers’ actions (see fig. 1). The majority of the threats affected natural resources, such as plants and wildlife, while the remainder threatened cultural resources, such as artifacts, historic sites, or historic buildings. (See app. I for a summary of the threats in each category at each of the eight parks.)

**Figure 1: 127 Direct Internal Threats to Cultural and Natural Resources, by Category**



<sup>5</sup>The eight parks and their locations: Arches National Park, Utah; Crater Lake National Park, Oregon; Gettysburg National Military Park, Pennsylvania; Indiana Dunes National Lakeshore, Indiana; Lake Meredith National Recreation Area, Texas; Minute Man National Historical Park, Massachusetts; Olympic National Park, Washington; and Saguaro National Park, Arizona. We were able to visit seven of the eight parks. A scheduled visit to Crater Lake was canceled because of winter storms. We used written and electronic means to complete our data gathering.

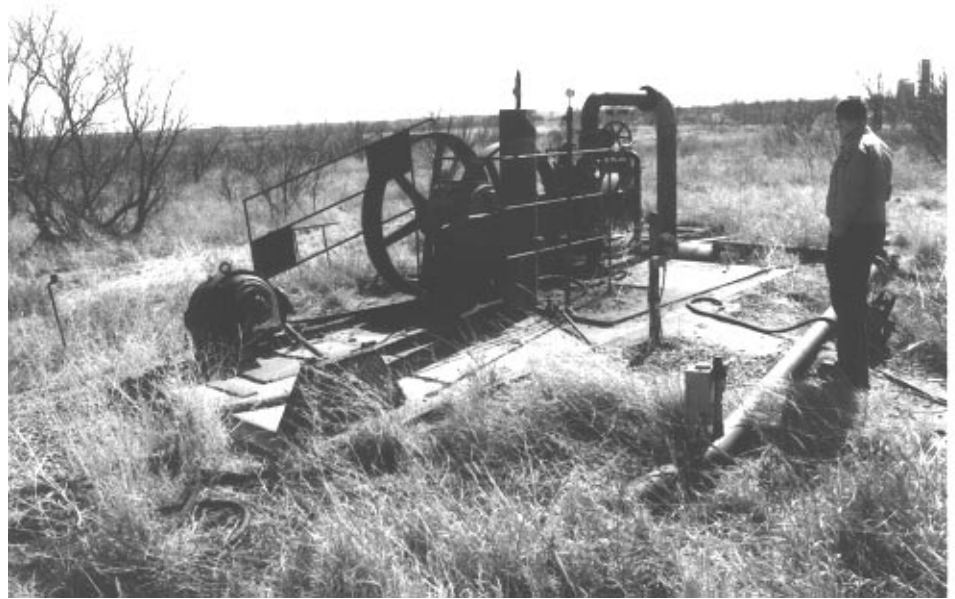


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Overall, the park managers we visited said that the most serious threats facing the parks were shortages in staffing, funding, and resource knowledge. The managers identified 48 additional threats in these categories. We classified these as indirect threats to cultural and natural resources because, according to the managers, the shortages in these areas were responsible for many of the conditions that directly threaten park resources. (See app. II for a list of these threats at the eight parks.) In addition, the managers identified other threats in such categories as laws or regulations, agency policies, and park boundaries. After reviewing the information about these threats provided by park managers in documents and interviews, we decided that the threats were indirect and should not be listed among the direct threats. In gathering data for each park, we also identified threats to services for visitors. Our analysis showed that many of these threats also appeared as threats to cultural and natural resources. We did not compile a list of threats to services for visitors because this report focuses on cultural and natural resources.

Private inholdings and commercial development within park boundaries accounted for the largest number of specific threats. The managers of seven of the eight parks we reviewed identified at least one threat in this category. For example, at Olympic National Park in Washington State, the managers said that the homes situated on inholdings along two of the park's largest lakes threatened groundwater systems and the lake's water quality. At Lake Meredith National Recreation Area in Texas, the managers were concerned about the impact of the frequent repair and production problems at about 170 active oil and gas sites (see fig. 2) and the development of additional sites.

**Figure 2: Oil Site at Lake Meredith National Recreation Area**



At the Minute Man National Historical Park, the long, linear park is bisected by roads serving approximately 20,000 cars per day. The traffic affects cultural resources, such as nearby historic structures; natural resources, such as populations of small terrestrial vertebrates (e.g., the spotted salamander and spotted turtle); and visitors' enjoyment of the park (see fig. 3).

**Figure 3: Heavy Traffic Near the Foundation of a Historic Building, at Left, at Minute Man National Historical Park**



Encroachment by nonnative wildlife and plants—such as mountain goats, trout introduced into parks’ lakes and streams, and nonnative grasses and other plants—accounted for the second largest number of reported threats. The managers at all of the parks we reviewed identified at least one threat in this category. At Arches National Park in Utah, for example, the managers cited the invasion by a plant called tamarisk in some riverbanks and natural spring areas. In its prime growing season, a mature tamarisk plant consumes about 200 gallons of water a day and chokes out native vegetation. At Olympic National Park, nonnative mountain goats introduced decades ago have caused significant damage to the park’s native vegetation. The goats’ activity eliminated or threatened the survival of many rare plant species, including some found nowhere else. Controlling the goat population reduced the damage over 5 years, as the contrast between figures 4a and 4b shows.

**Figure 4a: Vegetation Trampled and Erosion Along Klahhane Switchback Trail in Olympic National Park, Before Population Control**



Source: National Park Service.

**Figure 4b: Recovery of Vegetation in the Same Area Along Klahhane Switchback Trail in Olympic National Park, After Population Control**



Source: National Park Service.

Illegal activities, such as poaching, constituted the third main category of threats. The managers at the eight parks reported that such activities threatened resources. For example, at Crater Lake National Park in Oregon, the managers believe that poaching is a serious threat to the park's wildlife. Species known to be taken include elk, deer, and black bear. At both Crater Lake and Olympic national parks, mushrooms are harvested illegally, according to the managers. The commercial sale of mushrooms has increased significantly, according to a park manger. He expressed concern that this multimillion-dollar, largely unregulated industry could damage forest ecosystems through extensive raking or other disruption of the natural ground cover to harvest mushrooms. Similar concern was expressed about the illegal harvesting of other plant species, such as moss and small berry shrubs called salal (see fig. 5).

**Figure 5: Confiscated Moss at Olympic National Park**



Source: National Park Service.

About 30 percent of the internal threats identified by park managers fell into two categories—the adverse effects of (1) people’s visits to the parks and (2) the Park Service’s own management actions. The number of recreational visits to the Park Service’s 369 units rose by about 5 percent over the past 5 years to about 270 million visits in 1995. Park managers cited the effects of visitation, such as traffic congestion, the deterioration of vegetation off established trails, and trail erosion. The threats created unintentionally by the Park Service’s own management decisions at the national or the park level included poor coordination among park operations, policies calling for the suppression of naturally caused fires that do not threaten human life or property, and changes in funding or funding priorities that do not allow certain internal threats to parks’ resources to be addressed. For example, at Gettysburg National Military Park, none of the park’s 105 historic buildings have internal fire suppression systems or access to external hydrants because of higher-priority funding needs.

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## Threats Have Damaged Cultural Resources More Permanently Than Natural Resources

Park managers estimated that about 82 percent of the direct threats they identified in the eight parks we reviewed have caused more than minor damage to the parks' resources. We found evidence of such damage at each of the eight parks. According to the managers, permanent damage to cultural resources has occurred, for example, at Indiana Dunes National Lakeshore in Indiana and at Arches National Park in Utah. Such damage has included looting at archeological sites, bullets fired at historic rock art, the deterioration of historic structures, and vandalism at historic cemeteries. (See figs. 6 and 7.) At both of these parks, the managers also cited damage to natural resources, including damage to vegetation and highly fragile desert soil from visitors venturing off established trails and damage to native plants from the illegal use of off-road vehicles.

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**Figure 6: Historic Rock Art Used for Target Practice, Arches National Park**



**Figure 7: Deterioration of Rostone House, One of Five Historic 1933 World's Fair Houses, Indiana Dunes National Lakeshore**



At Gettysburg National Military Park, the damage included the deterioration of historic structures and cultural landscapes, looting of Civil War era archeological sites, destruction of native plants, and deterioration of park documents estimated to be about 100 years old, which contain information on the early administrative history of the park. Figure 8 shows these documents, which are improperly stored in the park historian's office.

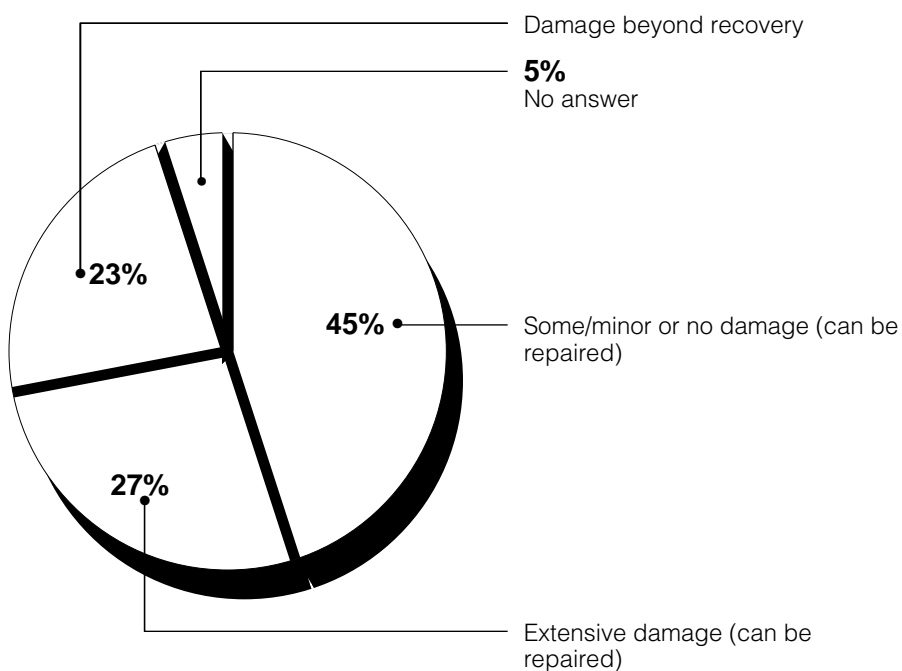


**Figure 8: Deterioration of 100-Year-Old Manuscripts, Gettysburg National Military Park**



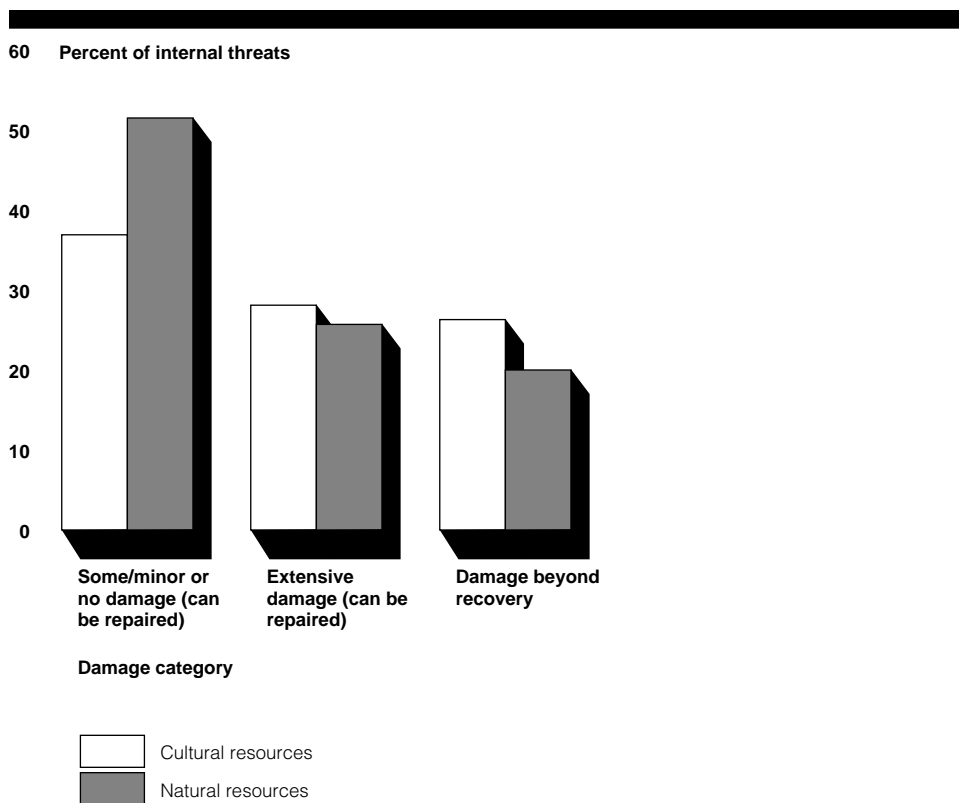
Nearly one-fourth of the identified direct threats had caused irreversible damage, according to park managers (see fig. 9). Slightly more than one-fourth of the threats had caused extensive but repairable damage. About half of the threats had caused less extensive damage.

**Figure 9: Extent of Damage to Cultural and Natural Resources Caused by Direct Internal Threats**



The damage to cultural resources was more likely to be permanent than the damage to natural resources, according to park managers (see fig. 10). Over 25 percent of the threats to cultural resources had caused irreversible damage, whereas 20 percent of the threats to natural resources had produced permanent effects. A Park Service manager explained that cultural resources—such as rock art, prehistoric sites and structures, or other historic properties—are more susceptible to permanent damage than natural resources because they are nonrenewable. Natural resources, such as native wildlife, can in some cases be reintroduced in an area where they have been destroyed.

**Figure 10: Severity of Damage to Cultural and Natural Resources, as Measured by Direct Internal Threats Reported at Eight Parks**

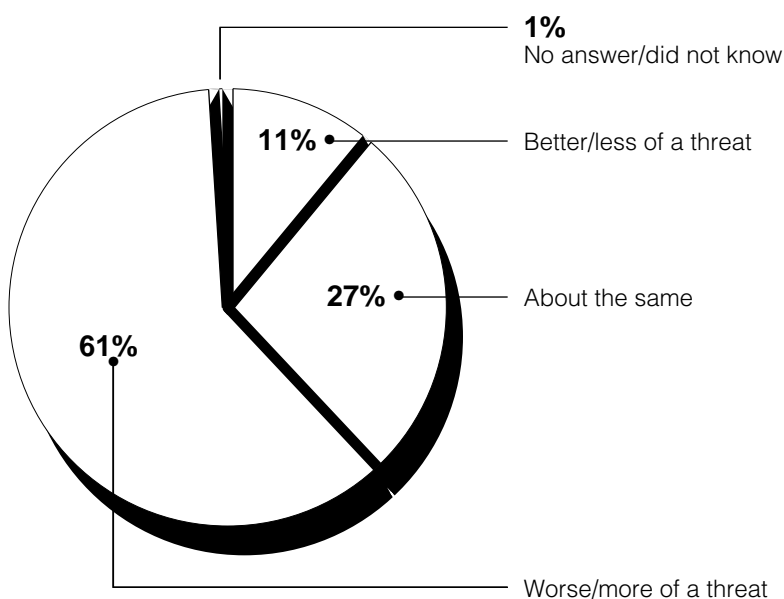


Generally, park managers said they based their judgments about the severity of damage on observation and judgment rather than on scientific study or research. In most cases, scientific information about the extent of the damage was not available. For some types of damage, such as the defacement of archeological sites, observation and judgment may provide ample information to substantiate the extent of the damage. But observation alone does not usually provide enough information to substantiate the damage from an internal threat. Scientific research will generally provide more concrete evidence identifying the number and types of threats, the types and relative severity of damage, and any trends in the severity of the threat. Scientific research also generally provides a more reliable guide for mitigating threats. In their comments on this report, Park Service officials agreed, stating that there is a need for scientific inventoring and monitoring of resource conditions to help park managers identify the resources most threatened.

## Managers Generally Saw Threats Increasing in Severity

At all eight parks, internal threats are more of a problem than they were 10 years ago, according to the park managers. They believed that about 61 percent of the threats had worsened during the past decade, 27 percent were about the same, and only 11 percent had grown less severe (see fig. 11).

**Figure 11: Trend in Severity of Direct Internal Threats at Eight Parks, 1985-95**



At seven of the eight parks, the managers emphasized that one of the trends that concerned them most was the increase in visitation. They said the increasing numbers of visitors, combined with the increased concentration of visitors in certain areas of many parks, had resulted in increased off-trail hiking, severe wear at campgrounds, and more law enforcement problems. At Arches National Park, for example, where visitation has increased more than 130 percent since 1985, greater wear and tear poses particular problems for the cryptobiotic soil.<sup>6</sup> This soil may take as long as 250 years to recover after being trampled by hikers straying off established trails, according to park managers.

<sup>6</sup>Cryptobiotic soil is found in all desert areas. The organisms in this soil contribute nutrients to these nutrient-poor environments. They also stabilize soil surfaces, protecting them from wind and water erosion. When the soil crusts are disturbed, these important functions are disrupted.

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Another increasing threat noted by managers from parks having large natural areas (such as Crater Lake, Olympic, and Lake Meredith) is the possibility that undergrowth, which has built up under the Park Service's protection, may cause more serious fires. According to the managers, the Park Service's long-standing policy of suppressing all park fires—rather than allowing naturally occurring fires to burn—has been the cause of this threat.

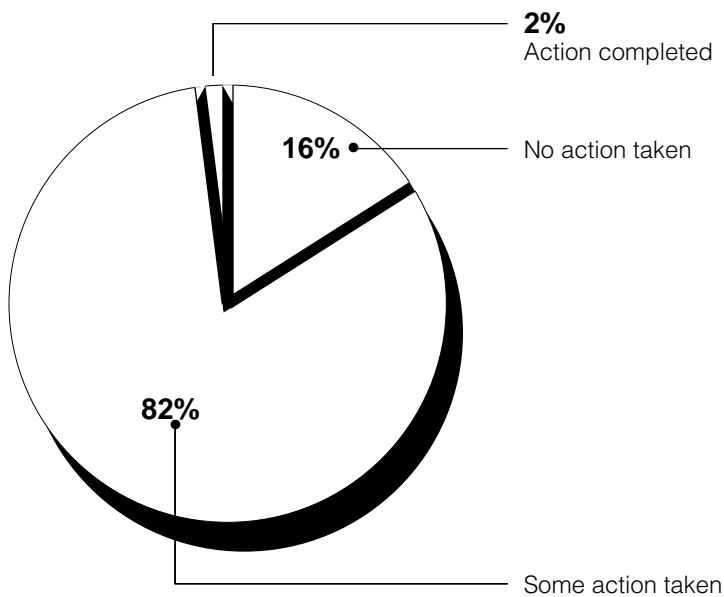
Although the park managers believed that most threats were increasing in severity, they acknowledged that a lack of specific information hindered their ability to assess trends reliably. The lack of baseline data on resource conditions is a common and significant problem limiting park managers' ability to document and assess trends. They said that such data are needed to monitor trends in resource conditions as well as threats to those resources.

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## Mitigation Has Been Limited Primarily to Studies

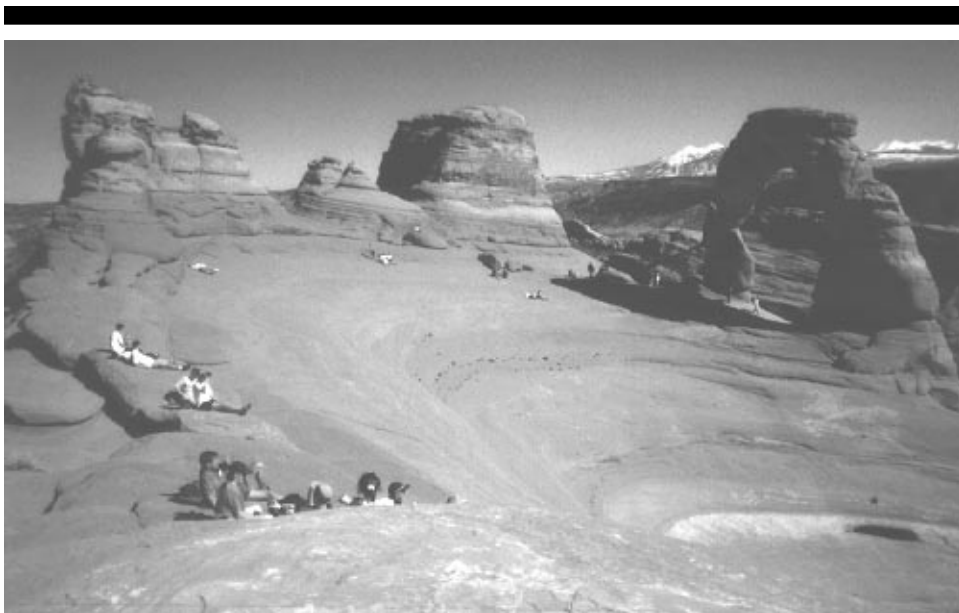
Park managers said that they believed some action had been taken in response to about 82 percent of the direct threats identified (see fig. 12). However, the Park Service does not monitor the parks' progress in mitigating internal threats. Various actions had been taken, but many were limited to studying what might be done. Only two actions to mitigate an identified threat have been completed in the eight parks, according to the managers. However, they noted that in many cases, steps have been taken toward mitigation, but completing these steps was often hampered by insufficient funding and staffing.

**Figure 12: Extent of Action Taken Against Direct Internal Threats at Eight Parks**



At Arches National Park, actions ranged from taking steps to remediate some threats to studying how to deal with others. To reduce erosion and other damage to sensitive soils, park managers installed rails and ropes along some hiking trails and erected signs along others explaining what damage would result from off-trail walking. Managers are also studying ways to establish a “carrying capacity” for some of the frequently visited attractions. This initiative by the Park Service stemmed from visitors’ comments about the need to preserve the relative solitude at the Delicate Arch (see fig. 13). According to park managers, about 600 visitors each day take the 1-1/2-mile trail to reach the arch.

**Figure 13: Arches National Park's Delicate Arch, Where Limits Are Being Considered on the Number of Visitors**



At Lake Meredith, to reduce the impact of vandalism, park managers are now replacing wooden picnic tables and benches with solid plastic ones. Although initially more expensive, the plastic ones last longer and cost less over time because they are more resistant to fire or other forms of vandalism. Lake Meredith has also closed certain areas for 9 months of the year to minimize the looting of archeological sites. At Saguaro National Park, the park managers closed many trails passing through archeological sites and revoked the permit of two horseback tour operators for refusing to keep horses on designated trails.

## Conclusions

The natural and cultural resources of our national parks are being threatened not only by sources external to the parks but also by activities originating within the parks' borders. Without systemwide data on these threats to the parks' resources, the Park Service is not fully equipped to meet its mission of preserving and protecting these resources. In times of austere budgets and multibillion-dollar needs, it is critical for the agency to have this information in order to identify and inventory the threats and set priorities for mitigating them so that the greatest threats can be addressed first.

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In our 1994 report on external threats to the parks' resources, we recommended that the National Park Service revise its resource management planning system to (1) identify the number, types, and sources of the external threats; establish an inventory of threats; and set priorities for mitigating the threats; (2) prepare a project statement for each external threat describing the actions that can be taken to mitigate it; and (3) monitor the status of actions and revise them as needed.

If the Park Service fully implements the spirit of our 1994 recommendations, it should improve its management of the parks' internal threats. We therefore encourage the Park Service to complete this work. Not until this effort is completed will the Park Service be able to systematically identify, mitigate, and monitor internal threats to the parks' resources.

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## Agency Comments and Our Evaluation

We provided a draft of this report to the Department of the Interior for its review and comment. We met with Park Service officials—including the Associate Director for Budget and Administration, the Deputy Associate Director for Natural Resources Stewardship and Science, and the Chief Archeologist—to obtain their comments. The officials generally agreed with the factual content of the report and provided several technical corrections to it, which have been incorporated as appropriate. The Park Service stated that it would not implement the recommendations cited from our 1994 report. However, we continue to believe that this information, or data similar to it, is necessary on a systemwide level to meet the Park Service's mission of preserving and protecting resources.

Park Service officials stated that obtaining an inventory of and information on the condition of the parks' resources was a greater priority for the agency than tracking the number and types of threats to the parks' resources, as our previous report recommended. They said that headquarters has the necessary systemwide information to make decisions but added that better data on the condition of resources are needed to allow the park managers to better identify the most threatened resources. They stated that the Park Service is trying to develop a better inventory and monitor the condition of resources as staffing and funding allow.

Park Service officials also cited a number of reasons why implementing our past recommendations to improve the resource management planning system's information on threats is no longer appropriate. Their reasons included the implementation of the Government Performance and Results



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Act, which requires a new mechanism for setting priorities and evaluating progress; the Park Service-wide budget database that is used to allocate funds to the parks; the existing databases that provide information on resources and workload; and the decentralization of the Park Service, which delegates authority to the park superintendents to determine what information is needed to manage their parks.

We continue to believe that information on threats to resources, gathered on a systemwide basis, would be helpful to set priorities so that the greatest threats can be addressed first. The Park Service's guidelines for resource management plans emphasize the need to know about the condition of resources as well as threats to their preservation. This knowledge includes the nature, severity, and sources of the major threats to the parks' resources. We believe that knowing more about both internal and external threats is necessary for any park having significant cultural and natural resources and is important in any systemwide planning or allocation of funds to investigate or mitigate such threats. We agree that the number and types of threats are not the only information needed for decision-making and have added statements to the report to describe the Park Service's efforts to gather data on the condition of resources.

In addition, the Park Service commented that a mere count and compilation of threats to resources would not be useful. However, our suggestion is intended to go beyond a surface-level count and to use the resource management plan (or other vehicle) to delineate the types, sources, priorities, and mitigation actions needed to address the threats on a national basis. We believe that the Park Service's comment that it needs a more complete resource inventory and more complete data on resources' condition is consistent with our suggestion.

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## Scope and Methodology

As agreed with your office, we conducted case studies of eight parks because we had determined at Park Service headquarters that no database of internal threats existed centrally or at individual parks. At each park, we interviewed the managers, asking them to identify the types of internal threats to the park's natural and cultural resources and indicate how well these threats were documented. We also asked the managers to assess the extent of the damage caused by the threats, identify trends in the threats, and indicate what actions were being taken to mitigate the threats. Whenever possible, we obtained copies of any studies or other documentation on which their answers were based.

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Given an open-ended opportunity to identify threats, a number of managers listed limitations on funding, staffing, and resource knowledge among the top threats to their parks. For example, the park managers we visited indicated that insufficient funds for annual personnel cost increases diminished their ability to address threats to resources. Although we did not minimize the importance of funding and staffing limitations in developing this report, we did not consider them as direct threats to the resources described in appendix I. These indirect threats are listed in appendix II.

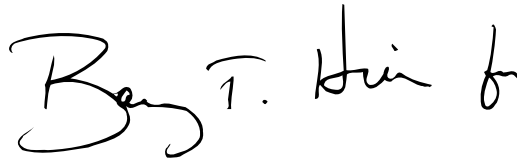
We performed our review from August 1995 through July 1996 in accordance with generally accepted government auditing standards.

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We are sending copies of this report to interested congressional committees and Members of Congress; the Secretary of the Interior; the Director, National Park Service; and other interested parties. We will make copies available to others on request.

Please call me at (202) 512-3841 if you or your staff have any questions. Major contributors to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink that reads "Victor S. Rezendes". The signature is written in a cursive style with a large initial "V" and "R".

Victor S. Rezendes  
Director, Energy, Resources,  
and Science Issues

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**Abbreviations**

GAO	General Accounting Office
NPS	National Park Service

# Number of Direct Internal Threats to Resources at Eight Parks Reviewed

On the basis of our analysis of the data, we determined that the following threats affect cultural and natural resources directly. Threats in the three other categories of staffing, funding, and resource knowledge are listed for the eight parks in appendix II.

Category/threat	Arches National Park	Crater Lake National Park	Gettysburg National Military Park	Indiana Dunes National Lakeshore	Lake Meredith National Recreation Area	Minute Man National Historical Park	Olympic National Park	Saguaro National Park	Total
<b>Private inholdings/commercial activities</b>									
Commercial development			1		2		1	2	6
Commercial film-making activities								1	1
Concession operations		2					2	1	5
Habitat destruction					1				1
Noncommercial inholdings			1	1	2	1		2	7
Road or utility corridors		1	1	2	2	2			8
Traffic congestion			1	1					2
Trash					1				1
Cactus fruit harvest								1	1
<b>Nonnative wildlife/plants</b>									
Exotic diseases		1	2					1	4
Nonnative invertebrates		1	2		1			1	5
Nonnative vertebrates	1	1	1		2		1	1	7
Nonnative plants	1	1	2	1	2	1	1	1	10

(continued)

**Appendix I  
Number of Direct Internal Threats to  
Resources at Eight Parks Reviewed**

<b>Category/threat</b>	<b>Arches National Park</b>	<b>Crater Lake National Park</b>	<b>Gettysburg National Military Park</b>	<b>Indiana Dunes National Lakeshore</b>	<b>Lake Meredith National Recreation Area</b>	<b>Minute Man National Historical Park</b>	<b>Olympic National Park</b>	<b>Saguaro National Park</b>	<b>Total</b>
<b>Illegal activities</b>									
Looting historic/ prehistoric specimens	2	1	1	1	1		1	1	8
Vandalism	2		1	1	2			2	8
Wildlife/plant/ mineral poaching	1	1	1		1		1	1	6
Marijuana cultivation						1			1
<b>Effects of visitation</b>									
Campfires		1							1
Noise							1		1
Off-trail soil/ vegetation deterioration	1	1		2	2		1	1	8
Traffic congestion		1	1	1					3
Trail erosion	1	1	2					2	6
Trash	1	1							2
Wildlife harassment								1	1
Increase in visitation	1								1
<b>Agency/park management actions</b>									
Fire suppression/ protection			2		1	1			4
Habitat destruction		1							1
Infrastructure design or maintenance	1	1	1					1	4
Hazardous waste		1							1

(continued)

**Appendix I  
Number of Direct Internal Threats to  
Resources at Eight Parks Reviewed**

<b>Category/threat</b>	<b>Arches National Park</b>	<b>Crater Lake National Park</b>	<b>Gettysburg National Military Park</b>	<b>Indiana Dunes National Lakeshore</b>	<b>Lake Meredith National Recreation Area</b>	<b>Minute Man National Historical Park</b>	<b>Olympic National Park</b>	<b>Saguaro National Park</b>	<b>Total</b>
Historical structure maintenance priorities			1						1
Below-standard collections storage			1			1			2
Deferred maintenance				1					1
Cultural landscape degradation						1			1
<b>Other</b>									
Commercial development		1							1
Habitat destruction			1	1		1			3
Stormwater erosion			1						1
Fire potential (cultural resources)				1					1
Shoreline erosion				1					1
Rodent infestation								1	1
<b>Total</b>	<b>12</b>	<b>18</b>	<b>24</b>	<b>14</b>	<b>20</b>	<b>9</b>	<b>9</b>	<b>21</b>	<b>127</b>



# Frequency of Responses Related to Staffing, Funding, and Resource Knowledge at the Eight Parks Reviewed

In addition to the direct threats to natural and cultural resources listed in appendix I, park managers of these resources also cited the following indirect threats that, in their opinion, significantly affected their ability to identify, assess, and mitigate direct threats to resources.

Threat	Arches National Park	Crater Lake National Park	Gettysburg National Military Park	Indiana Dunes National Lakeshore	Lake Meredith National Recreation Area	Minute Man National Historical Park	Olympic National Park	Saguaro National Park	Total
Agency or park personnel issues (e.g., number, allocation, recruitment, training)	2	1	2	2	2		3	2	14
Inadequate funding or shifting priorities	3	3		2			1	5	14
Inadequate resource knowledge (e.g., inventorying, monitoring)	2	2	6	2	2	2	2	2	20
<b>Total</b>	<b>7</b>	<b>6</b>	<b>8</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>9</b>	<b>48</b>

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