

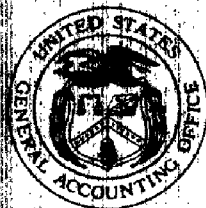
GAO

Report to the Chairman, Subcommittee
on National Parks, Forests, and Public
Lands, Committee on Natural Resources,
House of Representatives

January 1994

**NATIONAL PARK
SERVICE**

**Activities Outside Park
Borders Have Caused
Damage to Resources
and Will Likely Cause
More**



Resources, Community, and
Economic Development Division

B-255460

January 3, 1994

The Honorable Bruce F. Vento
Chairman, Subcommittee on National
Parks, Forests, and Public Lands
Committee on Natural Resources
House of Representatives

Dear Mr. Chairman:

America's national parks are rich in natural, cultural, and historical resources. Some of these resources, however, have been seriously damaged by activities originating outside the parks' boundaries, and many others face potential damage in the future. Activities outside the parks' boundaries that adversely affect park resources, such as power plants' causing air pollution or manufacturing facilities' causing water pollution, are referred to as external threats. Protecting park resources from the damage resulting from external threats is difficult because these threats are, by their nature, beyond the direct control of the Department of the Interior's National Park Service (Park Service).

In 1987, we reported¹ that the Park Service did not have resource management plans (RMP) to identify and track threats and was not monitoring its progress in mitigating the threats it had identified in its 1980 report entitled The State of the Parks.² Concerned about what has happened since our 1987 report and about the extent to which external threats are still affecting park resources, you asked us to review what the Park Service has done to (1) identify the number, type, and source of external threats to park resources; (2) identify what resources have been damaged by external threats; and (3) mitigate such damage. You also asked us to examine the threats internal to the parks; those threats will be the subject of a future review.

Results in Brief

Similar to what we found in 1987, the Park Service currently has no complete inventory of existing external threats, their sources, or the actions being taken to mitigate them. The Park Service's resource management system is designed to identify resource management problems, including external threats; describe needed mitigation actions;

¹Parks and Recreation: Limited Progress Made in Documenting and Mitigating Threats to the Parks (GAO/RCED-87-36, Feb. 9, 1987).

²U.S. Department of the Interior, National Park Service (Washington, D.C.: May 1980).

and communicate this information to Park Service decisionmakers. However, the current guidance does not require the collection of specific information on either the numbers or types of external threats facing individual parks, the source of the threats, the resources damaged, or the actions taken to mitigate the damage. Without such information, the Park Service cannot work effectively with parties outside the parks' borders to reduce or eliminate these threats.

To collect such information for this review, we distributed a questionnaire asking park managers to provide specific information on the external threats—up to three—that they considered the most serious source of damage or potential damage to their park's resources. The park managers identified 632 external threats, most of which fell into four broad categories: urban encroachment, water quantity and quality issues, air pollution, and human activities. Nevertheless, while the park managers could provide information on the types of external threats affecting park resources, they had not fully identified the specific source for all the external threats.

According to the park managers, damage has already resulted from about two-thirds of the threats they identified. This damage includes diminished scenic views, polluted streams, and destruction of wildlife and its habitat. Furthermore, the park managers estimated that additional damage will occur within the next 5 years as a result of almost all of the 632 threats identified. While park managers know what resources have been damaged by external threats, they are less knowledgeable about the extent of that damage.

The park managers said that actions had been taken to mitigate 367 of the 632 external threats they identified. However, the most commonly reported type of mitigation action was community outreach, which generally requires the cooperation of multiple parties and often represents an initial step toward minimizing damage to park resources. Furthermore, the project statements that describe, among other things, the actions needed to mitigate threats were not always prepared when threats were identified or, when prepared, did not always describe the actions needed to mitigate these threats. As a result, the Park Service has no means of monitoring the status of its progress in mitigating threats.

Background

The National Park System includes about 360 parks, covering 80 million acres. The National Park Service Organic Act of 1916 requires the Park

Service to conserve the scenery, natural and historic objects, and wildlife within the parks in order to leave them unimpaired for the enjoyment of future generations. Urban expansion and development activities, particularly at a time when the public's environmental awareness is increasing, have led to concerns that park resources are being seriously damaged by activities originating outside the parks' boundaries.

As early as the 1960s, the Park Service recognized that external threats were causing serious damage to park resources. These threats included polluted air (from nearby pulp and paper mills, coal-fired power plants, and petroleum refineries) that diminished the visitors' ability to view the natural resources of the parks; polluted water from chemical runoff that affected water quality in the parks; and expanded urban development that conflicted with historic and natural settings. In its May 1980 report, the Park Service identified, on the basis of a questionnaire sent to each park, over 2,000 threats attributed to external sources.

Following that report, the Park Service developed a strategy for addressing resource management problems. As part of this strategy, park managers were required to develop RMPS to identify and document the condition of each park's natural and cultural resources and the problems of managing these resources, including significant external threats. Resource management problems identified in the RMPS are to be addressed in project statements—written action plans that describe specific current and proposed projects or other management actions to be taken. Using the project statements, park managers establish priorities among the projects, develop yearly work plans, allocate available personnel and funds, and justify proposed funding increases. Project statements must be updated annually and RMPS at least every 4 years.

Park Service Currently Has No Threat Inventory, but Park Managers Identified Threats in Four Broad Categories

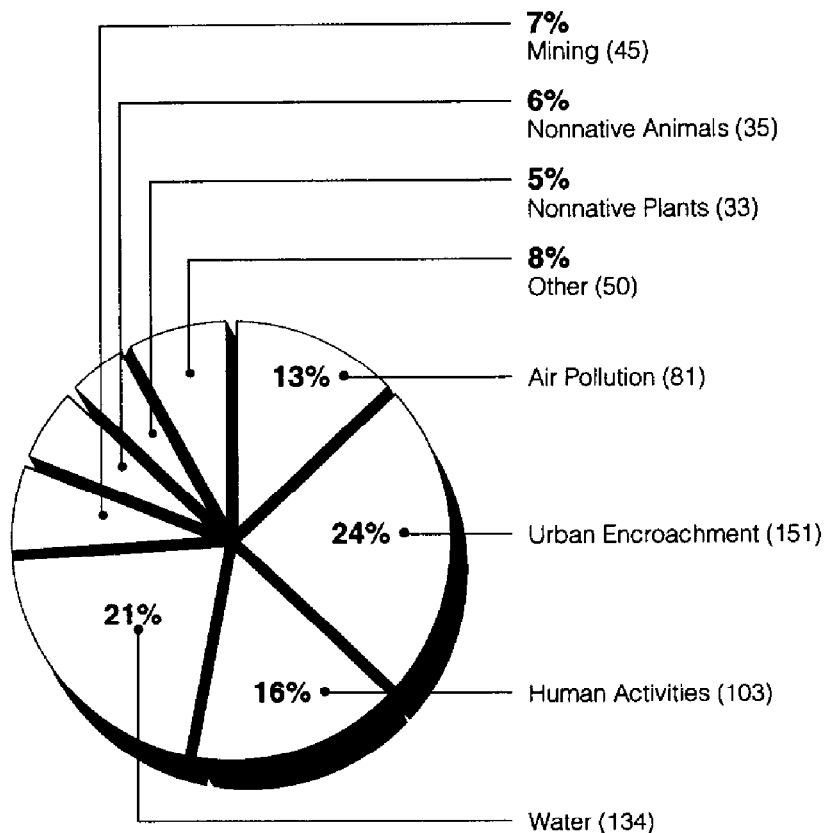
Although the RMPS were intended to provide Park Service management with information on threats, among other resource management problems, Park Service guidance does not require the collection of specific information on the number, types, and sources of external threats facing individual parks. As a result, the Park Service currently does not have an inventory of threats, even though the park managers we surveyed identified a number of threats and had at least partially identified the sources of most of these threats.

Our 1987 report noted that RMPS were not being prepared and that the Park Service had not updated the information in its 1980 report on threats. We

recommended that RMPs be prepared and updated in accordance with Park Service guidance and that the RMPs be used to identify and set priorities for natural and cultural resource needs. During our current review, we found that RMPs have generally been prepared. However, an inventory of threats is still not being produced. For this reason, the questionnaire we sent to individual park managers asked them to identify the three most serious external threats to their parks. Managers for 303 parks reported 632 threats. Managers for 14 parks reported having no significant external threats, and managers for 13 parks did not respond.³ As figure 1 shows, 74 percent of the external threats reported fall into four broad categories: urban encroachment, water quantity and quality issues, air pollution, and human activities.

³We sent questionnaires to park managers responsible for 330 of the Park Service's 357 parks. We excluded 27 parks that did not have federal acreage or facilities.

Figure 1: Reported Threats, by Type



Note 1: Numbers following the threat type indicate the total number of threats reported in that category.

Note 2: "Human Activities" include highway construction and operation, timbering, oil spills, agricultural activities, and aircraft flying over the park.

Note 3: "Other" includes rights-of-way, inholdings (privately owned land inside the boundaries of a park), and a lack of basic data on park resources.

Problems resulting from urban encroachment, such as residential, commercial, and industrial development at or near park boundaries, were the most frequently reported threats. For example, at Rocky Mountain National Park in Colorado, the park managers stated that construction of housing and a golf course adjacent to the park's boundaries had a negative

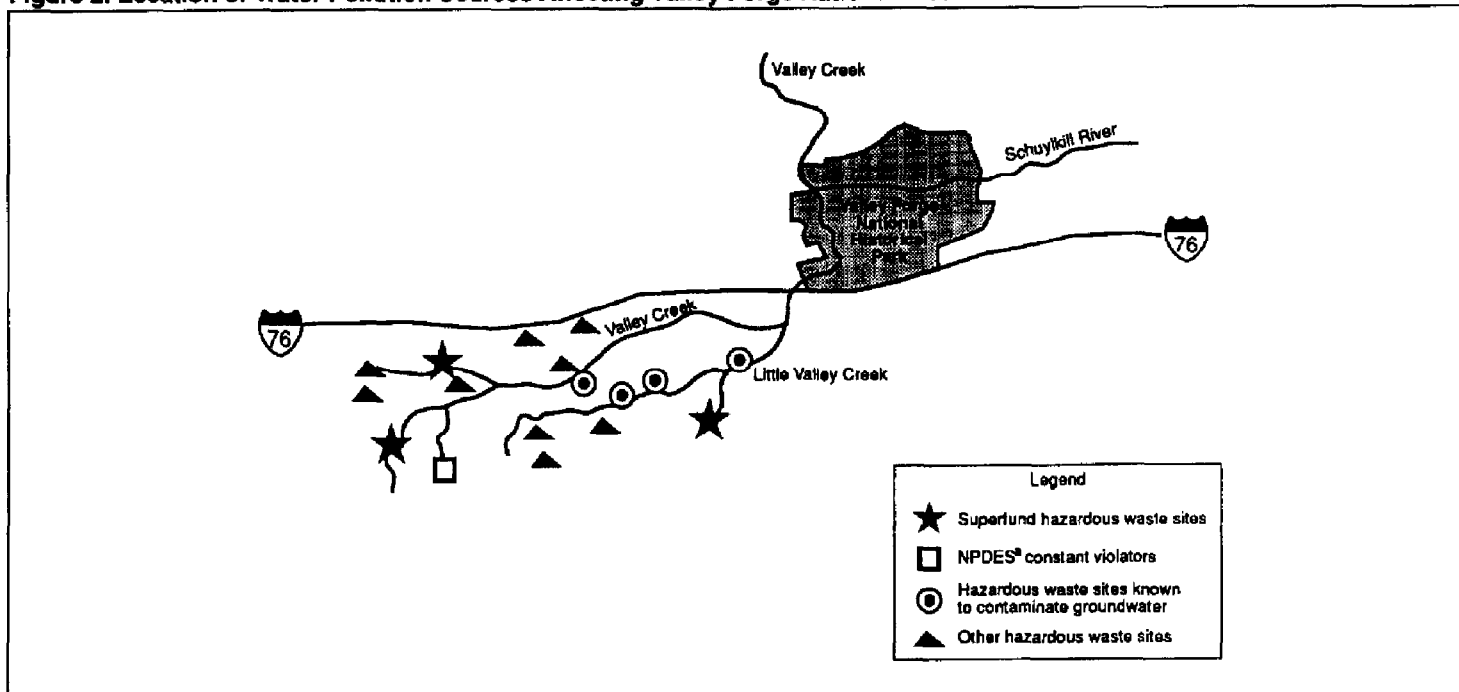
impact on wildlife habitat, scenic views, and the visitors' ability to experience the wilderness environment.

Water issues—including problems with water quality, alteration of natural flows, and lack of secure water rights—ranked second in the number of threats reported. For example, at Pipestone National Monument in Minnesota, pollution from businesses, agriculture, and industrial chemicals has adversely affected water quality. As a result, wetlands habitat in the park has been degraded and associated plant and animal life destroyed, and the aesthetic appeal of the creek and waterfall has been reduced by the frequent presence of foam, scum, and foul odors.

In addition to not inventorying the number and types of threats, the Park Service has not always identified the sources of the threats. In responding to our questionnaire, park managers indicated that they were able to fully identify the specific source or sources of the threats for only 229 of the 632 reported threats (36 percent), as in the following instance. The park manager at Yukon-Charley Rivers National Preserve in Alaska reported a serious threat to wildlife and to the visitors' experience as a result of low-altitude flights by military aircraft. According to the park manager, at critical times in the breeding season, low-altitude military jet operations have disrupted egg-laying and nesting by endangered peregrine falcons. These military operations have also negatively affected the visitors' ability to experience the solitude of a wildlife preserve. The park manager is currently monitoring noise levels and working with the military to alter flight paths.

The park managers were also able to partially identify the source for 318 of the 632 threats (50 percent). Full identification of threat sources can be a complex process, particularly when there are multiple sources. For example, at Valley Forge National Historical Park in Pennsylvania, the park managers have partially identified the sources of the water pollution that threatens the park. Along the 12-mile course of Valley Creek, part of which flows through the park, the park managers have identified at least 17 different pollution sources, but they believe there may be more sources. Among the pollution sources thus far identified are three Environmental Protection Agency (EPA) Superfund sites and three sewage treatment plants. In addition, the Schuylkill River, which flows through the park, is polluted by two nearby wastewater treatment plants. Figure 2 shows the location of these pollution sources in relation to the park.

Figure 2: Location of Water Pollution Sources Affecting Valley Forge National Historical Park



*The National Pollutant Discharge Elimination System (NPDES) is the major mechanism for regulating discharges from point sources. All sources must obtain a permit from EPA or a state-approved program that specifies water quality standards.

Source: National Park Service.

For 78 of the threats reported (12 percent), the park managers were unable to identify the specific source.⁴ For example, at Lava Beds National Monument in California, bald eagle concentrations have been greatly reduced because the eagles feed on adjacent agricultural lands polluted by the heavy use of pesticides. According to the park manager, however, where the pollution is coming from and who is causing it have not been specifically identified.

Resource Damage Has Occurred and More Is Anticipated

The park managers estimated that two-thirds of the threats they identified (422 out of 632) have caused some type of damage to park resources. Resources that have already been damaged include aesthetic values, that is, the visitors' ability to enjoy the surroundings; cultural resources; and resources such as air, water, or plant life. Furthermore, the park managers

⁴Managers for seven parks did not respond to this question.

estimated that within the next 5 years, damage is likely to occur from nearly all of the threats reported if no mitigating action is taken.

The resource most frequently cited in our survey as being damaged was aesthetic values, including visitors' appreciation of scenic views and a sense of solitude. For example, the park managers at Minute Man National Historic Park in Massachusetts reported that vehicle traffic has negatively affected visitors' experience along the park's primary attraction, the Battle Road of April 19, 1775. Furthermore, for safety reasons the park brochure warns visitors not to stop along this road to observe the historic sites because of heavy commuter traffic and the high rate of accidents.

When we asked the park managers to estimate the extent of the damage that will occur within the next 5 years, they responded that damage is likely to occur as a result of more than 97 percent of all the threats identified. Furthermore, for more than half the threats identified, they anticipate that this damage will occur to a great or very great extent. For example, the park managers at Wilson's Creek National Battlefield in Missouri reported that the creek waters have been polluted with metals and fecal bacteria from a wastewater treatment plant located 4 miles upstream of the park's boundary. This pollution has resulted in damage to the stream quality and has created an unsuitable habitat for native aquatic plants and animals. In addition, the visitors' experience has been damaged by noxious odors. According to the park's managers, the creek will be damaged to a greater extent over the next 5 years unless mitigation actions are taken.

The park managers have a number of methods at their disposal to identify resource damage, ranging from observation by park staff to scientific research. Observation alone does not usually provide sufficient information to substantiate damage from an external threat; scientific research will generally provide concrete evidence that an external threat has caused or will cause resource damage.

When the park managers reported that damage had already occurred, we asked whether any scientific research had been conducted to substantiate the damage. The park managers responded that scientific research had been conducted on the damage resulting from only about 34 percent of the threats (145 out of 422) as in the following example. At Redwood National Park in California, the park managers told us that scientists used research data that had been collected over a period of time to determine the extent of the damage—to native fish and other aquatic organisms, riparian

resources, and old-growth redwoods—that can be attributed to erosion from logging and related road building activities. On the basis of this scientific research, the park’s management is now in a position to begin to reduce the threat by advising adjacent landowners on better logging and road building techniques to decrease erosion.

For the remaining 66 percent of the threats, no scientific research was performed to identify the source of the damage. Rather than conducting scientific research, park management documented most damage through observation, usually by nonscientific staff. For example, at Crater Lake National Park in Oregon, nonscientific staff used observation and comparison of conditions in logged and nonlogged areas to identify the extent of damage caused by timber management practices and related logging activities. Damage resulting from these activities led to the loss of wildlife habitat and the elimination of the migration corridors necessary to maintain park wildlife populations. According to the park manager, the park did not have access to wildlife biologists or forest ecologists to conduct scientific research. Lacking such research, park management is not in a sound position to negotiate with the Forest Service and the logging community to reduce the threat.

Some Actions Have Been Taken to Protect Park Resources Despite Limitations in Project Statements

The actions park managers reported they took to protect park resources from external threats often represent initial steps toward minimizing impacts to park resources and do not mean the threats will be eliminated. Recognizing the need for a systematic approach to identifying and documenting the significant resource management problems described in the RMPS, including external threats, the Park Service requires each of its park managers to prepare and prioritize project statements for all current and proposed resource management work. Project statements are important because they serve as action plans for initiating work to minimize the threats’ negative impacts on park resources. However, for over half of the 632 threats the park managers reported to us, project statements had either not been prepared or, when prepared, generally did not address specific external threats, the source of the threats, or the needed mitigation actions.

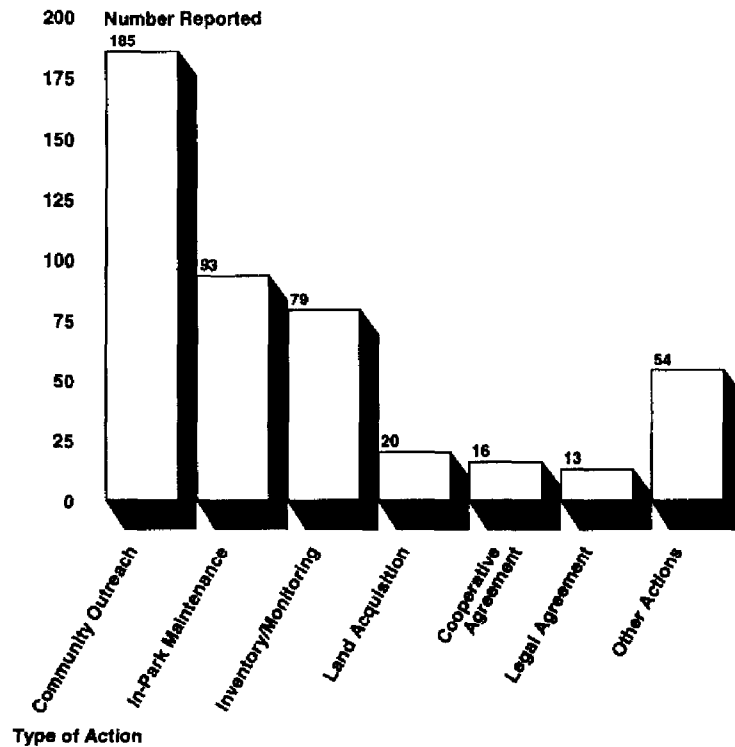
In responding to our questionnaire, the park managers reported that no project statements were prepared for 231 of the 632 external threats (37 percent) they identified as serious. The reasons most frequently given by the managers for not preparing project statements included inadequate

funding and data, insufficient park staff expertise, and higher priority work.

According to the park managers, project statements were prepared for the remaining 396 external threats identified as serious. We requested copies of the project statements prepared for these threats and received 299. We analyzed these 299 project statements and found that 117 (39 percent) did not address the specific external threat reported by the park managers. For example, although the park managers at Oregon Caves National Monument in Oregon reported a threat to cave formations because of increases in carbon dioxide resulting from fossil fuel burning and deforestation, the project statement provided to us is silent on the carbon dioxide threat. Instead, it addresses a potential threat to water quality resulting from the Forest Service's practices on adjacent lands. The park manager agreed that the project statement did not address the threat identified and should have been more specific.

While information on the needed mitigation actions was generally not available in the RMPs or the project statements, individual park managers often knew what mitigation actions were needed. In response to our questionnaire, the park managers indicated that for 456 of the 632 threats (72 percent), needed mitigation actions had been at least partially identified. They also reported that some mitigation actions were being taken on 367 of the 456 threats (80 percent). For 174 threats, the mitigation actions needed have not been identified or taken. There was no response regarding action on four threats. As shown in figure 3, community outreach was the most frequently reported action taken.

Figure 3: Actions Reported as Taken, by Category



Note: The number of actions reported totals 460, as more than one action was reported for 93 threats.

Community outreach included attending meetings and working with local planning commissions, other federal agencies, state and local governments, and private landowners to minimize the impacts of threats on park resources. Community outreach is generally an initial step toward mitigating threats and may not mean that the threat will be eliminated. At Guilford Courthouse National Military Park in North Carolina, urban growth in the area has led to an increase in commuter traffic through the park on a secondary state road that the Park Service had targeted for closure. The park managers report that the increased traffic noise and congestion compromise visitors' safety and the park's solitude and historic setting. However, rather than closing the road, the state of North Carolina has proposed widening it to handle more traffic, which could exacerbate the threat. The park managers are currently working with the chamber of

commerce, the city council, and the state transportation agency to get support for closing the road.

Conclusions

The nation's national parks contain extraordinary natural and cultural resources, most of which are irreplaceable. However, many of these resources are currently being threatened by sources external to the parks. The Park Service does not know the extent to which the resources under its stewardship are being threatened because it does not maintain an inventory of the number, types, and sources of threats or the damage caused. Without such information, management at Park Service headquarters does not know the extent to which external sources are threatening park resources, the amount of damage that has already occurred or is expected in the future, or the mitigation actions needed. In times of austere budgets, the Park Service needs this information to identify and inventory threats and set priorities for mitigation actions so that the highest-priority threats are addressed.

The Park Service has a resource planning system for identifying resource management problems. However, because current guidance does not specifically require it, this system is not being used to identify and inventory threats. The Park Service's project statements are also intended to delineate actions needed to correct resource management problems, including threats. These two tools, used together, could provide the Park Service with the necessary data to prepare an inventory of external threats and a mechanism for (1) identifying the sources of the threats and the mitigation actions needed and (2) setting priorities for addressing the threats. The sources of external threats are, by their nature, outside the purview of the Park Service. It is essential that the Park Service have the information it needs to work effectively with outside parties to develop a workable plan for reducing and eliminating external threats. Because of the severity of the threats to natural and cultural resources and the damage that has occurred and will occur, now is the time for the Park Service to use these tools to ensure that external threats are identified and their effects minimized so that future generations will be able to enjoy the resources of the national parks.

Recommendations to the Secretary of the Interior

While the Park Service has taken some actions to implement the recommendations we made in our 1987 report, a comprehensive inventory of threats and the actions needed to mitigate them has not been compiled. Therefore, to ensure that external threats are adequately addressed in

resource management planning, we recommend that the Secretary of the Interior direct the Director, National Park Service, to revise the Park Service's resource management planning system so that

- the number, type, and source of external threats are specifically identified, an inventory is established, and priorities are set for addressing the threats;
- project statements are prepared for each external threat, describing the mitigation actions that can be taken; and
- the status of threat mitigation actions is monitored and revised as needed.

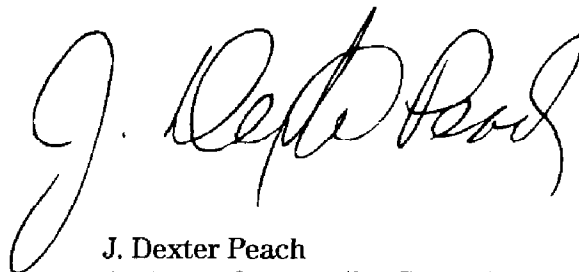
We based our work on responses we received to our questionnaire (reproduced in app. I) from park managers responsible for 317 parks. We supplemented this information with visits to 16 parks. (See app. II for a list of the parks.) Appendix III contains details on our scope and methodology.

We discussed the findings and observations contained in this report with officials from the Park Service, including the Acting Associate Director, Natural Resources, and the Acting Chief, Wildlife and Vegetation Service. These officials generally concurred with the facts as presented. However, as agreed with your office, we did not obtain written agency comments.

As further agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to the Secretary of the Interior and the Director, National Park Service. We will make copies available to others on request.

This work was performed under the direction of James Duffus III, Director, Natural Resources Management Issues, who may be contacted at (202) 512-7756 if you or your staff have any questions. Other major contributors to this report are listed in appendix IV.

Sincerely yours,



J. Dexter Peach
Assistant Comptroller General

Contents

Letter	1
Appendix I Responses to External Threats Questionnaire	16
Appendix II Park Units GAO Visited	32
Appendix III Scope and Methodology	33
Appendix IV Major Contributors to This Report	34
Tables	
Table I.1: Responses on Most Serious External Threats	27
Table I.2: Responses on Specific Sources of Threats	28
Table I.3: Responses on Specific Park Resources or Visitors' Experiences Damaged	30
Table I.4: Responses on Actions Taken to Mitigate Threats	31
Figures	
Figure 1: Reported Threats, by Type	5
Figure 2: Location of Water Pollution Sources Affecting Valley Forge National Historical Park	7
Figure 3: Actions Reported as Taken, by Category	11

Abbreviations

EPA	Environmental Protection Agency
GAO	General Accounting Office
RMP	Resource Management Plan

Responses to External Threats Questionnaire

U.S. General Accounting Office

GAO External Threats to National Parks

The United States General Accounting Office (GAO), an agency that examines issues for Congress, is conducting a study of the external threats to National Parks, those threats originating outside park boundaries. This investigation was requested by the Subcommittee on National Parks and Public Lands, House Committee on Interior and Insular Affairs.

As a part of our review we are sending a questionnaire to all National Park administrative units. In the questionnaire we are asking specifically about the efforts by the National Park Service (NPS) to identify and mitigate threats to park resources stemming from activities or actions outside park boundaries. Please have the person or persons on your staff who is most knowledgeable about these issues respond to this questionnaire.

If you are responsible for the administration of more than one park unit you may receive more than one questionnaire. Please respond to all questionnaires that you receive. The label on this questionnaire may also list more than one unit. We are considering the threats to these units together. If the label lists more than one unit please respond for all of these units on THIS questionnaire.

Please respond within 14 days of receipt of the questionnaire, if possible, in the enclosed self-addressed business-reply envelope. If the envelope is missing or has been misplaced please return the questionnaire to the following address:

U.S. General Accounting Office
Attn: Judy Hoover
Suite 1200
301 Howard St.
San Francisco, CA 94105-2252

If you have any questions please call Richard Griffone at (415) 904-2125, Judy Hoover at (415) 904-2175, or Nancy Boardman at (202)634-7288.

Thank you for your assistance.

DEFINITIONS - Please Read

For the purposes of this questionnaire we will be using the following definitions for these terms:

Impact

A detectable effect on the characteristics or integrity of a park resource or visitor experience.

Threat

A cause of actual or potential negative impact on park resources, values, purposes; or to park management objectives or visitor experiences. A threat exists when a current negative impact is expected to continue or when potential negative impact will occur within 5 years.

External Threat

A threat which originates outside park boundaries. Specifically where the source of the threat is outside the park but whose effects or impacts occur within park boundaries. We are NOT considering visitor impacts on park resources as external threats.

Natural Resource

Resources that do not stem from human action. For example plants, animals, geologic features, air, and aesthetic values.

Cultural Resources

Resources associated with people, cultures, and human activities and events either in the present or past. For this questionnaire we are NOT including NPS managed museum objects or collections or ethnographic activities.

Park

The NPS unit(s) as listed on the label.

**Appendix I
Responses to External
Threats Questionnaire**

Q1. When were each of the following plans and statements used for park management approved by the appropriate final authority for this park? (Enter year for each; if none approved, enter N/A)

Before 1989	1989 and beyond	
192	19	General Management Plan
87	166	Statement for Management
112	105	Resource Management Plan
89	74	Land Protection Plan

Q2. Has this park ever performed a formal inventory of external threats to its **NATURAL** resources? (Check one)

- 1. 198 No → Skip to Q.5
- 2. 78 Yes

Q3. In what calendar year was the most recent inventory of external threats to this park's natural resources completed? (Enter year)

Before 1989	1989 and beyond
42	34

Q4. In your best professional judgement how complete or incomplete is this inventory compared with the external threats facing this park today? (Check one)

- 1. 3 Extremely complete } Skip to Q.6
- 2. 47 Generally complete }
- 3. 25 Generally incomplete
- 4. 7 Extremely incomplete

Q5. How much of a role, if any, did each of the following have for the **LACK** of a complete inventory of external threats to natural resources for this park? (Check one for each)

	Very great role	Great role	Moderate role	Some role	Little or no role
1. No requirement to maintain inventory	26	37	41	53	63
2. RMP process not directed at developing inventories	13	28	48	54	72
3. Insufficient staff resources or funding	121	46	22	11	17
4. Inadequate knowledge of resources	26	51	36	51	51
5. Other (Please specify)	26	10	2	0	13

**Appendix I
Responses to External
Threats Questionnaire**

Q6. Has this park ever performed a formal inventory of external threats to its CULTURAL resources? (Check one)

- 1. 223 No → Skip to Q9
- 2. 54 Yes

Q7. In what calendar year was the most recent inventory of external threats to this park's cultural resources completed? (Enter year)

- 18 Before 1989
- 35 1989 and beyond

Q8. In your best professional judgement how complete or incomplete is this inventory compared with the external threats facing this park today? (Check one)

- 1. 4 Extremely complete } Skip to Q.10
- 2. 36 Generally complete }
- 3. 12 Generally incomplete
- 4. 2 Extremely incomplete

Q9. How much of a role, if any, did each of the following have for the LACK of a complete inventory of external threats to cultural resources for this park? (Check one for each)

	Very great role	Great role	Moderate role	Some role	Little or no role
1. No requirement to maintain inventory	28	40	50	44	69
2. RMP process not directed at developing inventories	13	42	52	47	76
3. Insufficient staff resources or funding	122	54	25	14	18
4. Inadequate knowledge of resources	28	56	49	38	59
5. Other (Please specify)	18	7	4	0	14

**Appendix I
Responses to External
Threats Questionnaire**

Q10. Does this park have any formal written agreements or memoranda of understanding with any of the following entities for research into or the mitigation of the effects of external threats? For this question do not include any service-wide agreements. (Check one for each)

	Yes	No
1. Other DOI agencies	37	231
2. Other federal agencies	51	217
3. Non-federal public agencies	71	201
4. Private landowners	24	237
5. Academic institutions	70	197
6. Other (Please specify)	17	96

Q11. Please estimate how many total dollars from this park's budget and how many park staff FTEs were expended to address external threats in fiscal years 1990, 1991, and 1992. (Enter amount for all)

	FY 1990	FY 1991	FY 1992
Dollar amount expended	\$7.7	\$9.4	\$13.1
FTEs expended	176.0	200.8	248.4

Q12. Of the total dollars expended from this park's budget in FY 1992 for external threats, what is the estimated percent, if any, that came from the following funding sources? (Enter percent for each; if none, enter 0)

	0%	1-99%	100%
Park base funding	62	83	109
Region controlled funding	191	67	2
WASO controlled funding	210	48	2
Other funding (Please specify)	231	17	3

In the next section of the questionnaire we will be asking you about the **THREE** most significant or serious external threats to this park. In identifying the external threats and answering questions about them, please be as specific as possible and avoid nondescriptive general threat categories. For example "removal of water from instream flows for municipal use" is a specific external threat. "Degradation of water quality" is a general category.

Questions 13 through 43 concern the most severe or most significant external threat facing this park. If this park has only one threat please answer questions 13 through 43 and then skip to Q.106. Questions 44 through 74 concern the second most severe external threat and questions 75 through 105 concern the third most severe external threat to this park. Again when we talk about threats we mean specific threats, not general categories.

Q13. What is the most severe specific external threat to this park?

Q44.

Q75.

See table I.1

**Appendix I
Responses to External
Threats Questionnaire**

Q14. What aspect of this external threat has the most
Q45. negative impact on this park's resources or
Q76. visitor experiences?

Refer to question 13

Q15. Which of this park's resources or values, if
Q46. any, are impacted by the most severe external
Q77. threat? (Check all that apply)

1. 519 Natural resources
2. 339 Cultural resources
3. 511 Visitor experiences

Q16. Which System-wide Natural Resource Issue
Q47. Code and/or Cultural Resource Issue Code best
Q78. describes the nature of this threat (a list of
codes is attached at the end of the
questionnaire)? (Enter code for each, if
applicable)

N _____ Natural Issue Code

C _____ Cultural Issue Code

Q17. Does this park have any Resource Management
Q48. Plan project statements specifically addressing
Q79. this threat for the purpose of identifying: 1) its
source, 2) its resulting damage, or 3) the
actions needed to mitigate or resolve it?
(Check one)

1. 396 Yes ⇒ 1) Please attach copy of
statement and

2) What is the highest
priority number of any
project statement
addressing this threat?

- 3) SKIP to Q.19

2. 231 No

Q18. Which of the following, if any, describe why
Q49. this park does not have an RMP project
Q80. statement addressing this threat? (Check all
that apply)

1. 67 Park staff directed at other, higher
priority problems
2. 81 Insufficient park staff expertise to
address this threat
3. 30 Specialist from outside park unit
needed to address threat not available
4. 89 Inadequate or insufficient data has
been collected on this threat
5. 91 Funding inadequate to address threat
6. 38 No corrective action or no additional
action can be taken
7. 32 Magnitude of threat is prohibitive
8. 48 Addressed in other park plans
9. 86 Other (Please specify)

Q19. How many, if any, formal written agreements
Q50. or memoranda of understanding with any of the
Q81. following entities does this park have for
research into or the mitigation of the effects of
this threat? For this question do not include
any service-wide agreements. (Enter number
for each; if none, enter 0)

- 54 Other DOI agencies
- 86 Other federal agencies
- 84 Non-federal public agencies
- 30 Private landowners
- 87 Academic institutions
- 32 Other (Please specify)

(Number represents the parks indicating
one or more agreements)

**Appendix I
Responses to External
Threats Questionnaire**

Q20. Have any of the formal agreements or
Q51. understandings listed above worked
Q82. significantly better or worse than the others? If
so, please explain below.

Total number of threats for which
an explanation was provided: 71
Better 32
Worse 10
Both 3
Neither 26

Q21. Has any natural, physical, or social scientific
Q52. research been done either by or on behalf of
Q83. the NPS to investigate this threat or any
associated damage to park resources? (Check
one)

1. 312 No ⇒ Skip to Q.23
2. 318 Yes

Q22. Who performed the research on this threat?
Q53. (Check all that apply)
Q84.

1. 167 Park resource staff
2. 119 NPS research scientist
3. 195 Non - NPS scientist
4. 69 Other (Please specify)

Q23. Please estimate how much, in total, has been
Q54. spent by this park to deal with this threat in
Q85. fiscal years 1990 through 1992? (Enter
amount; if none, enter 0)

\$33.7 million (estimate provided for
611 threats)

Q24. Please estimate how much additional money
Q55. will be required annually by this park to fully
Q86. mitigate the effects of this threat? (Enter
amount; if not answerable, check box)

\$1.2 million (estimate provided for
186 threats)
437 Not answerable

Q25. Has the specific source or sources of this threat
Q56. been identified? (Check one)
Q87.

1. 229 Yes, fully ⇒ Skip to Q.27
2. 318 Yes, partially
3. 78 No

If you checked **NO** to Q.25 above, answer Q.26 and
then skip to Q.30. If you checked **YES, FULLY** skip to
Q.27. If you checked **YES, PARTIALLY** answer all
questions through Q.30.

**Appendix I
Responses to External
Threats Questionnaire**

Q26. In the previous question you stated the specific source or sources for this threat have not been fully identified. There may be a number of reasons or factors that were responsible for this park's inability to identify the source or sources. How important, if at all, were each of the following factors in NOT being able to fully identify the specific source of this threat? (Check one for each)

	Extremely important	Very important	Moderately important	Somewhat important	Little or no importance
1. Magnitude of threat was prohibitive	62	91	85	59	76
2. Source of threat is changing or likely to change	66	110	82	55	61
3. Insufficient park staff	132	120	67	29	35
4. Unavailability of needed specialists	76	102	66	69	60
5. Inadequate staff training or expertise	81	72	90	70	61
6. Unavailability of needed equipment or instruments	61	62	63	68	113
7. Inadequate park funding	194	95	42	22	23
8. Other (Please specify)	31	12	5	0	12

If you checked NO to Q.25 skip to Q.30 now.

Q27. What is the specific source or sources of this threat as identified so far?
Q58. threat as identified so far?
Q89. See table 1.2

Q28. How was the source or sources of this threat identified? (Check all that apply)
Q59.
Q90.

1. 440 Informal observation
2. 276 Study or comparison of applicable events or resources by NPS staff
3. 206 Study or comparison of applicable events or resources by personnel outside NPS
4. 82 Formal scientific analysis performed by NPS scientist
5. 158 Formal scientific analysis performed by non - NPS scientist
6. 81 Other (Please specify)

**Appendix I
Responses to External
Threats Questionnaire**

- Q29. Who manages the land where the actual or
Q60. suspected source of this threat is located?
Q91. (Check all that apply)
1. 81 Other DOI agencies
 2. 159 Other federal agencies
 3. 312 State, county, or local governments
 4. 51 Tribal units
 5. 410 Private
 6. 52 Other (Please specify)

- Q30. Please estimate to what extent, if any, park
Q61. resources or visitor experiences will likely be
Q92. damaged or further damaged by this threat in
the next 5 years? (Check one)
1. 139 Very great extent
 2. 198 Great extent
 3. 180 Moderate extent
 4. 98 Some extent
 5. 13 Little or no extent

- Q31. To the best of your knowledge, through
Q62. September 30, 1992, have park resources or
Q93. visitor experiences been damaged by this
threat? (Check one)
1. 422 Yes
 2. 111 No } Skip
 3. 97 Don't } to
 - Know } Q.35

- Q32. What specific park resources or visitor
Q63. experiences have been damaged in this park by
Q94. this threat?
- See table I.3

- Q33. To the best of your knowledge, to what extent
Q64. have park resources or visitor experiences been
Q95. damaged by this threat through September 30,
1992? (Check one)
1. 69 Very great extent
 2. 115 Great extent
 3. 143 Moderate extent
 4. 83 Some extent
 5. 9 Little extent

- Q34. How was the damage caused by this threat
Q65. identified? (Check all that apply)
Q96.
1. 371 Informal observation
 2. 231 Study or comparison of applicable
events or resources by NPS staff
 3. 125 Study or comparison of applicable
events or resources by personnel
outside NPS
 4. 78 Formal scientific analysis performed
by NPS scientists
 5. 122 Formal scientific analysis performed
by non - NPS scientists
 6. 30 Other (Please specify)

- Q35. Have the actions this park needs to take to
Q66. mitigate this threat and/or its resulting damage
Q97. been determined? (Check one)
1. 119 Yes, fully => Skip to Q.37
 2. 337 Yes, partially
 3. 174 No

If you checked NO to Q.35 above, answer Q.36 and
then skip to Q.44. If you check YES, FULLY skip to
Q.37. If you checked YES, PARTIALLY answer
Q.36 and continue.

**Appendix I
Responses to External
Threats Questionnaire**

Q36. In the previous question you stated the needed actions to mitigate this threat have not been fully determined.
 Q67. There may be a number of reasons or factors that were responsible for this park's inability to determine
 Q98. these actions. How important, if at all, were each of the following factors in NOT being able to fully
 determine the actions needed to be taken by this park to mitigate this threat? (Check one for each)

	Extremely important	Very important	Moderately important	Somewhat important	Little or no importance
1. Magnitude of threat was prohibitive	103	102	103	71	101
2. Ongoing or changing nature of threat	85	146	108	62	83
3. Inadequate park staff size	148	137	83	47	75
4. Unavailability of needed specialists	93	111	92	92	94
5. Lack of cooperation or coordination with other organizations	85	87	105	81	127
6. Inadequate data on threat or its effects	165	148	85	48	40
7. Other (Please specify)	66	22	7	1	13

If you checked NO to Q.35 skip to Q.44 now.

Q37. Are the needed mitigation actions planned by
 Q68. this park aimed at affecting this threat at its
 Q99. source(s) or at mitigating the effects of the
 threat within the park? (Check one)

1. 113 Affecting source
2. 100 Mitigating effects
3. 239 Both affecting source and mitigating effects

Q38. Have the actions needed to be taken by this
 Q69. park to mitigate this threat or the damage
 Q100. caused by this threat been documented in a
 project statement or other specific plan?
 (Check one)

1. 122 Yes, fully → Skip to Q.40
2. 236 Yes, partially
3. 96 No

**Appendix I
Responses to External
Threats Questionnaire**

Q39. Why have all needed mitigation actions NOT been fully documented? (Check all that apply)
Q70.
Q101.

1. 270 All needed mitigation actions not determined
2. 150 Source of threat likely to change
3. 136 Park staff directed at other, higher priority problems
4. 111 Expertise needed to address threat not available
5. 213 Inadequate funding
6. 44 Other (Please specify)

Q40. As of October 1, 1992, has this park taken any action (beyond writing a project statement) to mitigate this threat? (Check one)
Q71.
Q102.

1. 367 Yes → Skip to Q.42
2. 87 No

If you checked NO to Q.40 above, answer Q.41 and then skip to Q.44.

Q41. Why has this park not taken any mitigation action for this threat? (Check all that apply)
Q72.
Q103.

1. 47 Insufficient staff
2. 26 Needed expertise not available
3. 19 Funding not requested
4. 38 Requested funds have not been received
5. 66 No jurisdiction over source of threat
6. 40 Needed cooperation or coordination with other agencies/interests has not been achieved
7. 30 Magnitude of threat is prohibitive
8. 12 Other (Please specify)

If you answered Q.41, now SKIP to Q. 44 now.

Q42. Have the mitigation actions actually taken BY THIS PARK been aimed at affecting this threat at its source or at mitigating the effects of the threat within the park? (Check one)
Q73.
Q104.

1. 115 Affecting source
2. 83 Mitigating effects
3. 166 Both affecting source and mitigating effects

Q43. What actions has this park taken to affect this threat at its source or to mitigate its effects?
Q74.
Q105.

See table I.4

**Appendix I
Responses to External
Threats Questionnaire**

Q.106 If you have any additional comments on the subjects covered by this questionnaire or other matters dealing with external threats to the National Parks, please add on the next page.

Yes - 45

**Appendix I
Responses to External
Threats Questionnaire**

Table I.1: Responses on Most Serious External Threats (Questions 13, 44, and 75)

Threat category	Number of threats reported
Air pollution	
Visibility	22
Biological	17
Cultural	13
Other	1
Multiple	28
Subtotal	81
Urban encroachment	
Development	
Residential	27
Commercial	18
Both residential and commercial	71
Industrial	3
Other	19
Multiple	13
Subtotal	151
Human activities	
Highways	19
Aircraft	21
Timbering	7
Other	45
Multiple	11
Subtotal	103
Water issues	
Quality	65
Lack of secure water rights	2
Alteration of natural flows	54
Disruption of natural coastal dynamics	7
Other	2
Multiple	4
Subtotal	134
Mining	45
Nonnative animals	
Livestock	15
Other	19

(continued)

**Appendix I
Responses to External
Threats Questionnaire**

Threat category	Number of threats reported
Multiple	1
Subtotal	35
Nonnative plants	33
Physical processes	
Wildfires	2
Water erosion/gullying	4
Degradation of soils	1
Other	1
Subtotal	8
Lack of basic resource data	3
Inholdings	4
Rights-of-way	
Roadways	5
Other	4
Multiple	2
Subtotal	11
Other	24
Total threats	632

Table I.2: Responses on Specific Sources of Threats (Questions 27, 58, and 89)

Source category	Number of threats reported
Air pollution	
Urban activities	6
Power-generating plant construction/operation	10
Other industrial plants	6
Other	5
Multiple	24
Subtotal	51
Urban encroachment	
Residential development/construction	29
Commercial development/construction	16
Both residential and commercial development/construction	64
Industrial development/construction	6
Other	18
Multiple	17
Subtotal	150

(continued)

**Appendix I
Responses to External
Threats Questionnaire**

Source category	Number of threats reported
Human activities	
Off-road vehicle use	1
Military exercises/equipment	6
Road or highway construction/operation	22
Aircraft operation	13
Railroad operation	3
Other	51
Multiple	18
Subtotal	114
Water quality	
Sewage treatment plant construction/operation	2
Landfills	2
Agricultural runoff	1
Other	13
Multiple	26
Subtotal	44
Water quantity (water supply and/or control)	
Municipal diversion	12
Private diversion	7
Dam and/or artificial reservoir operation	9
Other	8
Multiple	7
Subtotal	43
Animals	
Livestock grazing/trampling/feces runoff	13
Feral	3
Other	4
Multiple	1
Subtotal	21
Biological	
Nonnative plants	17
Nonnative animals	6
Multiple	4
Subtotal	27
Mining	45
Timber harvesting	13
Agriculture	7
Other	18

**Appendix I
Responses to External
Threats Questionnaire**

Table I.3: Responses on Specific Park Resources or Visitors' Experiences Damaged (Questions 32, 63, and 94)

Resource category	Number of threats reported
Aesthetic resources	
Scenic views	70
Noise	15
Other	6
Multiple	24
Subtotal	115
Air resources	
Quality	2
Visibility	3
Other	4
Subtotal	9
Animal resources	
Mammals	5
Fish	7
Birds	2
Multiple	10
Subtotal	24
Cultural landscapes	
Archeological sites	11
Historical sites	20
Historical structures	19
Other	1
Multiple	7
Subtotal	58
Geologic features	6
Plant resources	32
Water and hydrologic features	13
Other	9
Multiple	153

**Appendix I
Responses to External
Threats Questionnaire**

Table I.4: Responses on Actions Taken to Mitigate Threats (Questions 43, 74, and 105)

Type of action taken	Number of threats reported
Achieving legal agreements, taking court action	10
Instituting cooperative agreements	11
Community outreach: attending meetings, participating in planning commissions	117
Adjustment in operation/activity of threat source: e.g., limiting power plant generating activities, adjusting water flow, adjusting timbering activities	4
Inventory and/or monitoring: e.g., water sampling, air quality testing, gathering data to prepare for legal action	28
Land acquisition or easements (includes all activities: actions begun, in progress, or completed)	12
In-park maintenance	56
Other	28
Multiple	93

Park Units GAO Visited

Arizona

Saguaro National Monument
Casa Grande National Monument

California

Redwood National Park
Sequoia-Kings Canyon National Park
Golden Gate National Recreation Area
Point Reyes National Seashore
John Muir National Historic Site

Colorado

Rocky Mountain National Park

Maryland

Monocacy National Battlefield

Pennsylvania

Gettysburg National Military Park and Cemetery
Eisenhower National Historic Site
Valley Forge National Historical Park

Oregon

Crater Lake National Park

Virginia

Appomattox Court House National Historical Park

Washington

North Cascades National Park
Olympic National Park

Scope and Methodology

In conducting our review, we sent a questionnaire to park managers asking them to identify the three most significant external threats to their park. They were then asked to describe (1) the progress made in identifying the source or sources of the threats; (2) the damage to park resources as of September 30, 1992, and the damage anticipated within the next 5 years; (3) their efforts in planning needed mitigating actions; and (4) success in mitigating the damage. (App. I contains a copy of the questionnaire and the responses we received.) In developing our questionnaire, we consulted with National Park Service officials and pretested the questionnaire at 12 parks.

We sent questionnaires to all parks in the system meeting the following criteria: (1) the Park Service had direct management responsibilities for the park or (2) the park contained some federal facilities or federal acreage.¹ For each of the Park Service's 10 regions, we discussed the parks in that region with knowledgeable staff to reach final agreement on the parks to which we would send questionnaires. We also discussed our final list of parks with officials at Park Service headquarters. We sent questionnaires to park managers responsible for management at 330 of the Park Service's 357 parks, and received responses from managers responsible for 317 parks. Of the 13 parks whose managers did not respond to our questionnaire, one was Everglades National Park, which was affected by Hurricane Andrew.

In addition, we visited 16 parks, where we interviewed park managers with responsibilities for resource management in order to discuss (1) efforts to identify and mitigate external threats and (2) responses to the questionnaire. (See app. II for a list of the park units we visited.) We judgmentally selected these parks to obtain geographic diversity and a variety of park types (battlefields, monuments, etc.) and to follow up on questionnaire responses. In addition, we discussed threat identification and mitigation efforts with officials at the Park Service's Washington, D.C., headquarters; Air Quality and Water Resources Division offices in Colorado; Mid-Atlantic, Rocky Mountain, and Western regional offices; and four cooperative park study units (University of Arizona, University of California at Davis, Colorado State University, and Pennsylvania State University). Our review was conducted from January 1992 through October 1993, in accordance with generally accepted government auditing standards.

¹Examples of park units to which questionnaires were not sent are the Missouri National Recreation River, which is managed by the U.S. Army Corps of Engineers, and Weir Farm, which contained no federal facilities and no federal acreage.

Major Contributors to This Report

**Resources,
Community, and
Economic
Development
Division, Washington,
D.C.**

**James R. Hunt, Assistant Director
John Kalmar, Jr., Assignment Manager
Jonathan T. Bachman, Senior Social Science Analyst
Nancy Boardman, Staff Evaluator**

**San Francisco
Regional Office**

**Steven G. Reed, Core Group Manager
Richard Griffone, Evaluator-in-Charge
Judy Hoovler, Staff Evaluator
Alexandra Y. Martin-Arseneau, Senior Evaluator**

Ordering Information

The first copy of each GAO report and testimony is free. Additional copies are \$2 each. Orders should be sent to the following address, accompanied by a check or money order made out to the Superintendent of Documents, when necessary. Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

Orders by mail:

U.S. General Accounting Office
P.O. Box 3015
Washington, MD 20884-3015

or visit:

Room 1000
700 L St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
Washington, DC

Orders may also be placed by calling (302) 512-6000
or by using fax number (301) 258-4066.

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



Address Correction Requested

