

STATE OF THE PARKS; A REPORT TO THE CONGRESS
ON A SERVICEWIDE STRATEGY FOR PREVENTION AND MITIGATION
OF NATURAL AND CULTURAL RESOURCES
MANAGEMENT PROBLEMS

DEC 1980

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I. INTRODUCTION

The 1980 State of the Parks Report which the National Park Service submitted to the Congress earlier this year was a significant step in assessing the Service's natural and cultural resource problems of the 1980s. That report illustrated the magnitude and extent of threats that exist within and adjacent to the national parks. It stated that no parks were immune and that the Service, if it is to fulfill its mandates to provide the necessary protection of its significant natural and cultural resources, immediately must initiate a systematic program of threats prevention and mitigation within the more than 320 units under its stewardship.

The State of the Parks Report received considerable attention from the Congress, press, conservationists and the public. It also provided the Service with a new point of reference for doing something about the threats, despite budget and personnel limitations faced by every Park Superintendent. It made each park employee more aware of problems in his/her park, and other parks, and provided a catalyst for the Service to reaffirm its efforts in resources maintenance, protection, interpretation, monitoring, research and planning.

In June, the regions and the individual parks were asked to prepare mitigation programs for those important problems which already had been quantified, and additionally to take steps to better understand those threats which were not yet documented. Each Superintendent was also asked to reassess the reported threats to park resources and to provide the Washington Office both with that reassessment and with a preliminary report on park prevention and mitigation actions.

The information received from the regions and parks was subsequently summarized and assessed to provide further insight into park problems and needs Servicewide.

The results of this assessment have been used for two purposes. First, to develop a Servicewide prevention/mitigation strategy for responding to the natural and cultural resource management problems facing the Service; this strategy is discussed in Section II. Second, to provide the documentation which the Committee requested concerning monitoring/research activities and mitigation activities which are either currently underway, planned to be initiated in FY 81, or being held in abeyance pending necessary funding. These data are presented and discussed in Section III.

II. PREVENTION/MITIGATION STRATEGY

The prevention/mitigation plan presented in this report is comprised of two elements: a short-term program (Phase I) which will lead to the development of a set of natural and cultural resource management needs, ranked in order of Servicewide priority, together with a mechanism for incorporating the most important of these needs into the FY 83 budget cycle; and a mid-term program (Phase II) which will lead to the development of a comprehensive Resources Management Plan for every park unit, followed by the systematic use of these Plans in the formulation of the FY 84 budget. These two components of the overall NPS prevention/mitigation strategy are described further in the following paragraphs.

A. Phase I - Short-Term Prevention/Mitigation Program

It is clear that the Service cannot wait until the completion of the next budget cycle (FY 83) before taking action to mitigate its more

serious problems. Although many of the identified threats, particularly those that can be responded to with a change in management style or via programming of funds and personnel within a park, have been addressed to one degree or another, some of the most severe and pervasive problems are those that require additional funds or personnel. This initial phase of the Service's prevention/mitigation plan is designed to respond to that need.

The Service will immediately initiate a systematic program of identification, documentation, and prioritization of those particular natural and cultural resource management problems which have high importance and which warrant special attention and emphasis. This subset of resource management problems are referred to as "Significant Resource Problems" (SRPs). The process begins with the development of Significant Resource Problems (SRPs) in every park and includes an upward evaluation to where the highest priority SRPs will become the basis for the Service's natural and cultural resource FY 83 budget submissions. This strategy includes the following timetable:

1. Issuance of Suggested Ranking Factors for Selecting and Prioritizing SRPs - by Dec. 19, 1980
2. Submission of Park SRPs to Appropriate Regions - by Feb. 1, 1981
3. Submission of Regional SRPs Priorities to Washington - by Feb. 10, 1981
4. Regional Director's SRPs Ranking Workshop - by Feb. 20, 1981
5. Servicewide SRPs for Natural and Cultural Resources - by Feb. 25, 1981

Ranking factors for selecting and prioritizing SRPs will provide suggested guidance to Park Superintendents and Regional Directors for ranking the various internal and external problems that impinge upon the natural and cultural resources of each park. Park Superintendents will be expected to develop SRPs for the park's most threatening problems. Each SRPs write-up must include sufficient information so that the Regional Director can assess

and rank in order of priority all SRPs for further assessment at a Regional Director's workshop.

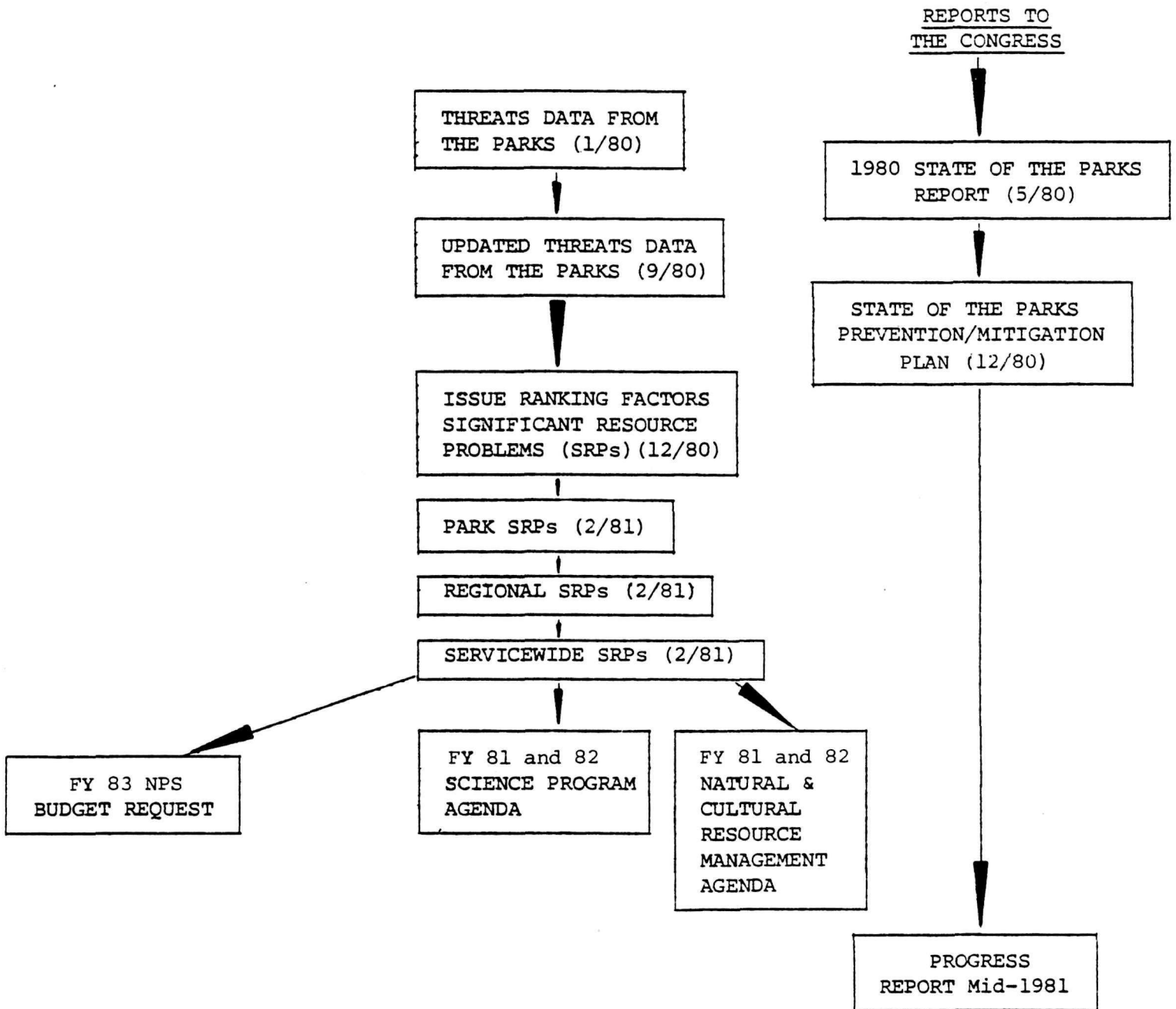
The material to be provided for each selected SRP will include: (1) a descriptive Title of the problem, (2) a Problem Description that includes the magnitude of any resource loss, immediacy of the impact, and origin of the problem, (3) Management Mandates that include our responsibilities under legislation, Executive Orders, Service policy, etc., (4) Actual and Anticipated Needs that include actions required to prevent or mitigate the problem and, (5) Cost Estimates that may include resources management, monitoring and research.

Regional lists of SRPs, ranked in order of regional importance, will undergo a final review by the combined Regional Directors at a workshop designed for that particular purpose. Washington Office natural and cultural resources management and science personnel will provide staff support for this evaluation process. The results of this exercise will provide detailed insight into the magnitude and severity of natural and cultural resources problems that exist Servicewide, the ranking of those problems, and the development of new natural and cultural resources protection and science agendas. It will then be determined which problems require additional budget and personnel allocations for inclusion in the FY 83 budget cycle, and which problems can be addressed by a reprogramming effort in FY 81 and FY 82.

Figure 1 illustrates schematically the principal elements of the short-term program. We plan to prepare a progress report by mid-1981 which will summarize the accomplishments and the status of activity at that time.

FIGURE 1

PHASE I - SHORT-TERM PROGRAM



B. Phase II - Mid-Term Prevention/Mitigation Program

This phase of the prevention/mitigation program focuses on the development of comprehensive Resources Management Plans for each unit of the System and the use of these Plans in the budget processes of FY 84 and later years.

Resources Management Plans are one part of the Service's General Management Plans, but usually are prepared independently by Park Superintendents. They document all resources management, monitoring and research activities relating to the management of natural and cultural resources in parks. They describe resource problems and discuss the full range of resource-related activities underway and anticipated. Resources Management Plans are a park's uniquely important document for the management of its natural and cultural resources.

The 1980 State of the Parks Report indicated that only about one out of every three of the NPS areas possessed approved Resources Management Plans. A review of this situation revealed that existing Resources Management Plan guidelines do not adequately address current issues and problems, and provide for neither a concise and systematic framework for problem prevention/mitigation, nor a commitment to a comprehensive park resources management program for Park Superintendents.

For this reason, revised Resources Management Plan Guidelines will be completed and sent to the field during December 1980. All Park Superintendents are required to prepare or revise their plans for regional approval by December 1, 1981. Plan preparation will include the development of SRPs (discussed above) by February 1, 1981; these SRPs will become Project Statements within a park Resources Management Plan.

In addition, four supporting documents will be completed during 1981 that will provide further guidance to the field on issues that should be incorporated into Resources Management Plans. Each topic has direct relationship to either issues or problems to be addressed or to techniques or methods that may be utilized in resolving or assessing threat effects. These four documents include:

1. Information Baseline Standards which describe an appropriate inventory of significant natural and cultural park resources and provide guidance for setting information gathering priorities.
2. Special Protection Zone Guidelines which deal with the process of designating selected areas within the parks for special attention in order to protect fragile or unique resources.
3. Boundary Study of Historical/Archeological Parks to determine the adequacy of the park boundaries with respect to protecting the prime cultural resources that the parks were established to preserve.
4. Biological Monitoring and Environmental Indices which provide guidelines for monitoring and reporting the condition of natural and cultural resources.

These four documents are described further in Attachments 1 through 4, respectively.

C. Other Activities

In addition to the activities described above under both the short-term and mid-term programs, six other supporting projects are underway and are expected to be completed during 1981 and 1982. These projects are described in Attachments 5 through 10, respectively, and include the following:

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The short-term and mid-term programs together with the supporting activities described above provide a mechanism for incorporating comprehensive Resources Management Plans into a systematic Servicewide planning process. That process requires annual revision of Resources Management Plans and the continuous building of one year's progress into the next. This approach to threats prevention/mitigation is essential if the Service is to fulfill its mandate to preserve the natural and cultural resources for future generations.

Two progress reports will be prepared to document the progress of our threats mitigation activities. The first of these progress reports will be submitted in 1981 after the completion of the short-term program; the second progress report will be submitted in 1982 and will review the status of the mid-term program at that time.

III. ONGOING AND PLANNED PROTECTION AND MITIGATION ACTIVITIES

A. Specific Park Projects Underway and Anticipated

In addition to the above short-term and mid-term programs designed to elevate the Service's natural and cultural resource needs to higher priority status for budget implementation, NPS areas are making a major effort at problem prevention and mitigation with available funds and personnel allocations.

Information received from the field concerning specific park protection and mitigation projects has been analyzed and summarized in relation to the various threat categories utilized in the 1980 State of the Parks Report.

The projects have been aggregated according to the type of actions taken:

1) a corrective activities status, which indicates that a corrective action

has been initiated in an effort to mitigate a specific problem, and
2) a monitoring and/or research status, which indicates that action is being taken to further define the seriousness of the problem and/or nature of the threat.

Table 1 presents a Servicewide summary of the corrective activities and/or monitoring/research activities either underway in FY 80, planned for FY 81, or requiring additional funds to initiate; these data are shown for each of seven threat categories (i.e., air pollution, water pollution, aesthetic degradation, physical removal of resources, exotic encroachment, visitor physical impacts, and park operations). Table 1 indicates that 455 corrective activities were underway in FY 80 to address threats in individual parks, 467 corrective activities are planned in FY 81, and 257 corrective activities will require additional funds before mitigation can begin. Similarly, Table 1 shows that 438 monitoring/research activities were underway in individual parks in FY 80, 403 monitoring/research activities are planned for FY 81, and 253 other monitoring/research activities will require funding for their initiation.

Attachments 11 through 17 provide a more detailed Servicewide summary of the status of actions for each of the above seven major threat categories. Finally, Attachments 18 through 24 indicate the status of actions on a park-by-park basis for each threat category.

TABLE 1. Number of Parks Reporting Monitoring/Research Activities
and Corrective Activities

<u>THREAT CATEGORY</u>	<u>Monitoring/Research Activities</u>			<u>Corrective Activities</u>		
	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>
AIR POLLUTION	82	80	48	18	23	9
WATER POLLUTION	82	77	42	38	31	15
AESTHETIC DEGRADATION	82	75	22	119	117	63
PHYSICAL REMOVAL OF RESOURCES	63	54	49	90	100	69
EXOTIC ENCROACHMENT	43	43	26	56	56	22
VISITOR PHYSICAL IMPACTS	50	47	25	80	78	37
PARK OPERATIONS	36	27	41	54	62	42
TOTAL	438	403	253	455	467	257

IV. SUMMARY AND CONCLUSIONS

The strategy outlined in this report involves a systematic and time-phased approach to National Park Service management of its natural and cultural resources. It includes the gathering of facts about the severity of park problems, the assessment and prioritization of those problems, the establishment and the implementation of an agenda leading to problem mitigation, and finally, the evaluation of the effectiveness of the Servicewide resources management program. Our approach includes implementation of a short-term program designed to introduce high priority resources management needs into the FY 83 budget cycle coupled with the reprogramming of available funds to respond to specific problems requiring immediate attention. In addition, we include a mid-term program which focuses on the development of comprehensive Resources Management Plans for each unit of the System and provides a process whereby the results of these Plans can effectively be built into FY 84 and later NPS budgets. These two programs incorporate a number of supporting activities which input criteria, standards, guidelines and recommendations into the process of resources management priority setting.

The prevention/mitigation activities currently underway or planned by individual parks deal primarily with well-defined problems and threats which originate, for the most part, from within park boundaries. Our review of these activities indicates that, while we can deal effectively with some of the less pervasive internal natural and cultural resource problems with existing funds, many important internal problems and threats remain and simply cannot be addressed within existing staffing and funding resource allocations.

Problems associated with sources located outside the park boundaries are considerably more complex and much more difficult to deal with. Our continuing review of these problems has convinced us that any real mitigation of adverse impacts to the parks resulting from external threats will require a substantially expanded program within the Service augmented in many instances by favorable zoning, land use, and regulatory control actions on the part of local and State governments.

Individual parks have identified more than 500 separate monitoring/research and/or corrective actions that should be started but that require additional funds to permit initiation. Many of these actions relate to resolving high priority problems which today are adversely impacting the basic integrity of the natural and cultural resources of the parks. We have asked Congress to provide funds for an expanded science and resources management program in the past. We must again ask Congress in upcoming budget submissions to give special attention to bolstering science and resources management activities in the Service. We believe it is important that the Congress recognize that the Service will not be able to implement many of the high priority mitigation projects projected in this report unless additional funding and staffing resources are made available.

We, in the National Park Service, have recognized for some time the destruction and degradation of the natural and cultural resources of the parks. The recent 1980 State of the Parks Report brought clearly into focus the magnitude and the severity of problems which we face. We have the will and the commitment to deal with these problems, but we simply do not have the necessary resources. That is an urgent need, and we ask for the support of the Congress in responding to it.

Attachment 1 INFORMATION BASELINE STANDARDSObjective

To encourage the creation of exhaustive, systematic information bases for all park natural and cultural resources by issuing guidelines and standards modeling an idealized and complete park resources information base.

Existing Situation

Few, if any, parks presently have a complete inventory of natural and cultural resources. The completeness varies, i.e., Great Smoky Mountains NP and Delaware Water Gap NRA have completed pilot inventories of all park resources while other parks do not possess even the most basic data, such as good vegetation maps. Most parks add to their information base as a result of direct inventory or as a by-product of research, but some parks may never assess information bases for completeness or manage the data to facilitate its utility.

Few parks possess adequate information to implement enlightened management strategies for all the resources therein. The need for additional data varies with the type and diversity of resources within a park, and the extent of past research activities in it. Needed information can be secured through additional research; priority research needs are generally already identified in completed Resources Management Plans. However, information on ecosystem functioning is usually not assessed in the context of the full array of such information that is needed for intelligent park resources management.

Relevance to Threats

Good knowledge on the identity and location of all park resources and how they function within ecosystems is prerequisite to their wise stewardship. Production of good General Management Plans, effective threats documentation via research, and implementing wise resources management actions all are highly dependent on the adequacy of the park resources information base. Put simply, you can only develop plans to protect those things that have been identified and located, otherwise their damage, loss, or extinction within a park will likely go unnoticed, and you can only manage properly those resources whose functioning within the system is understood.

What We Propose

NPS will soon place very high Servicewide emphasis on identifying the status or completeness of each park resources information base, and then will require every Park Superintendent to improve upon it. Improving it will require that priority be given to conducting more basic field inventories on various subtypes of resources including physical, biological, archeological, historical, etc., and also carrying out more studies on ecosystem function.

This new emphasis will be assisted by developing Servicewide checklists and guidelines on how to compile a good information base on all significant park resources. These checklists will represent an idealized park resources information base and will serve as a reference in setting information gathering priorities.

Attachment 2 SPECIAL PROTECTION ZONE GUIDELINESObjective

To promote effective protection and management of natural resources through more disciplined application of site designation and the NPS management zoning system.

Existing Situation

Current procedures used to protect natural resources in parks via site designations and zones have not been entirely adequate commensurate with the need. This is due to confusion over the purpose and relationship among the various site designation and zoning categories, insufficient guidelines and procedures, and lack of Servicewide emphasis on all of these activities.

A number of site designations are available for use in parks to delimit areas possessing significant natural resource features and to specify recreational, scientific, and management activities. These designations integrate all or parts of the NPS units into national or international systems which have been established to assure long-term protection and compatible, usually limited, use of designated areas. NPS emphasis on designating areas to these protection systems has been variable, ranging from a highly visible legislatively-mandated national program for designating wilderness to minimal emphasis on designating sites for long-term observational or experimental research. In addition, NPS has adopted a park zone/subzone system to restrict various visitor use and management activities to certain areas of a park. Accepted subzones such as the Outstanding Natural Feature Subzone and the Natural Environmental Subzone can be used to prescribe the management emphasis in significant or sensitive natural areas.

Relevance to Threats

Many fragile, rare, unique, or outstanding natural features occurring in parks can be damaged by various forms of human activities. Giving these sites special recognition and surveillance can promote their continued preservation through the judicious application of site designation and the NPS zoning system. Of particular concern is the need for more monitoring and ecological research, often of a long-term nature, to identify and evaluate threats as well as to better understand the structure and function of natural ecosystems. The establishment of research natural areas and experimental ecological reserves within parks lends support to potential long-term monitoring relating to early-warning systems and indices.

What We Propose

The relationship between site designations and the prescriptive zoning system needs clarification to ensure that effective actions are implemented through zoning to carry out the purpose of the site designations. The National Park Service will review the use of special protection zones and recommend a disciplined approach involving, as appropriate, new and revised designation and zoning categories, guidelines, and increased national program direction. Special emphasis will be placed on how to (1) enhance protection of small fragile, unique, or rare resources and (2) encourage the establishment and stewardship of more designated areas for observational and experimental research.

Attachment 3 BOUNDARY STUDY OF HISTORICAL/ARCHEOLOGICAL PARKSObjective

To provide an assessment by Service professionals (historians, archeologists and historical architects) of the inadequacy of the boundaries of historical and archeological parks to protect the prime cultural resources that those parks were established to preserve.

Existing Situation

The boundaries of many historical and archeological parks are too restricted to protect the resources that the park was intended to preserve. In some instances, such resources are presently outside of park boundaries or not sufficiently protected by needed buffer zones. This condition has resulted from insufficient appropriations to purchase authorized land, ignorance of the full extent of the significant resources when park boundaries were set, and in some instances, deliberate decisions to purchase only those minimal amounts of land needed to provide a federal presence in the area. Decisions to establish overly restricted boundaries have often resulted from a failure to appreciate potential population growth and land use changes in the vicinity of individual parks.

Relevance to Threats

Appropriate boundaries and the purchase of tracts within them, be it in fee or less than fee, can eliminate certain classes of threats by denying space for adverse development on or by a historic site.

What We Propose

The Service will conduct a study to determine the boundary status at each historical and archeological park. It should indicate whether or not basic data needed to establish effective boundaries are at hand, and, if not, what studies are needed to provide such data. When such data are available, the appropriate professional will draw the boundary needed to protect significant park resources and suggest the nature of the land purchase to be accomplished within that boundary. These recommendations will be available to National Park Service managers and Congressional legislators when boundary changes, or needs for them, are considered. (This report was previously requested by the House Subcommittee on National Parks and Insular Affairs to assist that committee in evaluating legislative proposals for boundary changes.)

Objective

To provide the Service with guidelines on the use and methods of implementing a prototype biological monitoring and environmental indices system.

Existing Situation

Environmental monitoring is the systematic and repetitive collection and analysis of data which can be used to (1) help determine the quality of the environment including the condition of natural and cultural resources as they are now or as they change with time, or (2) to help relate the environmental quality, including natural and cultural resources, to factors which cause them to change, or to effects produced by such changes. The monitoring process includes design, quality assurance, data management, data analysis, research and development in support of data collection and interpretation, coordination of agency activities, and the review, distribution, and use of the resulting information.

Environmental indices are means for assimilating information about overall environmental quality/conditions. Their purposes are to enhance communications and to facilitate the judgement and decision-making processes. Environmental indices are potentially powerful tools for highlighting significant environmental conditions, illustrating major trends, formulating environmental goals, and measuring progress towards these goals. They can be useful in devising environmental control programs and determining their success, both prospectively and retrospectively. Indices can be effective in defining alternatives, assessing trade-offs, constructing environmental impact statements, and informing both laymen and professionals about the status of environmental quality.

No systematic method or program exists within the Service for monitoring the condition of natural and/or cultural resources nor does the Service presently utilize a set of environmental indices to facilitate presentation of the results of monitoring in a form that can be easily understood by governmental decision-makers and by the public.

Relevance to Threats

Monitoring can fulfill a variety of important functions that relate directly to threats. The first function, that of baseline information, provides a benchmark from which to measure threat-related environmental changes and to assess their significance. The second function, standards development, is important because monitoring will allow development of information bases for establishment of parameter standards, such as for pollutants. The third function, compliance monitoring, is the collection of information, such as pollution levels, to verify compliance with regulatory standards set by operations of Federal, State and local governments. The fourth function, research and development, provides information for development of models and instrumentation. Finally, the fifth function, that of public or agency alert, provides a warning system for agency action and/or public alert.

What We Propose

The Service in August of this year initiated an in-house analysis of potential monitoring programs and environmental indices that could be developed to meet Service needs. The most appropriate systems and programs will be selected and formulated into guidelines for monitoring of the various biological processes and the use of those data in developing long-term indices. These guidelines will be prepared in such a manner that the most appropriate system and program can be selected for use by the field to best match particular needs.

In addition, the Service will initiate a program to evaluate its success with Servicewide prevention/mitigation of natural and cultural resource threats that will evolve into long-term indices and will be utilized within the follow-up reports to Congress. The State of the Parks - 1983 Report will depend upon this program for implementation.

Attachment 5

TRAINING: NATURAL RESOURCES MANAGEMENT FOR SUPERINTENDENTS,
MID-LEVEL, AND BEGINNING EMPLOYEESObjective

To instill in responsible National Park Service employees wider experience and greater knowledge of natural resources management.

Existing Situation

The majority of park personnel responsible for the management of park resources do not possess adequate experience and knowledge for current problem identification and assessment, as well as prevention and mitigation techniques to address current technological problems. Although some Service personnel possess considerable expertise in one or more fields, few individuals possess sufficient background to coordinate a holistic natural resources management program required for the perpetuation of park resources as per NPS mandates in today's world.

Relevance to Threats

If the Service is to be successful in a threats prevention and mitigation program it must depend upon the immediate and correct actions of its field personnel. Those personnel must possess adequate knowledge, skills and motivation to apply a modern resources management program that includes maintenance, protection, monitoring and research.

What We Proposed

A systematic approach to natural resources management is required that includes training for top management, mid-level, and beginning personnel.

Top management level training includes one course, the Management of Natural Resources for Park Managers (already developed and underway). This course is designed to provide Park Superintendents and other managers (GS-11 and above) with a perspective of ecological concepts and philosophy, a working knowledge of policy, environmental law, planning and techniques necessary to assess internal and external threats to parks. The course also explores on-going resources management programs, giving the manager ideas and options which can strengthen his/her natural resources management program.

Mid-level training includes one course, the Management of Natural Resources-Mid-Level (currently under development and scheduled for December 1980) and seven workshops.

The mid-level course is designed to examine the numerous activities involved with a systematic approach to natural resources management. It will include the interrelationships between the park resources management specialists, park and contract scientists, park rangers, maintenance and interpretive personnel as they relate to the activities of maintenance, protection, monitoring, and research, as well as the relations between the field, regions and the Washington Office. The course will cover the history of natural resources management, NPS resource policies, threats to the parks, and resources management planning. Special attention will be given to park baseline information needs, and the role, development and value of Resources Management Plans.

The seven workshops include those oriented to threats identification, assessment and mitigation. Separate workshops will be developed on the areas of Natural Systems, Developed Areas, Aquatic Systems, Plant Communities and Species, Cave Systems, Wildlife and Fish, and Air Quality (already underway).

Beginning personnel training includes a one-week session at the Ranger's Skills course that addresses the basics of natural resources management. This session is designed to introduce the new employee to the importance of resources protection, maintenance, monitoring and research within the Service, and to instill in him/her the philosophy of "resources first".

The course and workshops described above may be of necessity or choice developed with other training delivery methodologies/techniques (i.e., handbooks, packaged programs, programmed instructions, etc.). Participants will be carefully identified and selected to attend those sessions which are highly job related, except for development experiences as needed.

Table 2 illustrates these training priorities.

Attachment 6

TRAINING: NATURAL RESOURCES MANAGEMENT
DEVELOPMENT (TRAINEE) PROGRAM

Objective

To establish a cadre of expert Natural Resources Management Specialists within all major natural areas of the Service as quickly as possible.

Existing Situation

The natural resources of the National Park System have been greatly impacted in recent years from increasing pressures from internal and external threats, as well as the inability of current park personnel to adequately address the technological implications associated with those threats. There are currently only 136 permanent positions Servicewide related to natural science/research programs, and only 136 general resources managers (including those who manage cultural resources). Park personnel capable of dealing effectively with the current technological problems impinging upon the parks are minimal.

Relevance to Threats

If the Service is to deal with the multitude of threats facing the parks, more NPS staff that are highly trained in natural resources management are going to be needed. Threats mitigation will require in-house, permanent expertise in the parks to identify, assess, and develop strategies to mitigate and prevent impacts, and then to coordinate the holistic resources management programs necessary.

What We Propose

The Service has developed a major Natural Resources Management Specialist Training Program designed to place well qualified resources managers into every major natural area. The program will begin with 30 new positions, placed into in-Service comprehensive training programs jointly developed by the Washington Office, regional offices and the benefitting parks. Program funds and positions will be allocated through Washington with principal coordination responsibilities provided by the regions. Training assignments will be established for 18 to 24 month periods in which time the trainees will be assigned to, and be living within, benefitting parks. Curriculum will be developed to include a variety of components reflecting the major needs of each benefitting park. At the completion of each training program, the 30 trainees will remain at the benefitting park, but the 30 positions and funds will be reallocated to 30 additional parks where the demand for a natural resources specialist has been identified. The benefitting parks and/or regions will be responsible for continuing the new specialist's salary and position allocation.

The cost will be approximately \$1 million annually for the duration of the program, which includes salaries for the GS-7/9/11 trainees and for support of a full assemblage of training activities.

Objective

To develop a plan for the implementation and use of automated data processing in order to improve data handling of information relevant to resources management and research activities Servicewide.

Existing Situation

The management of natural and cultural resources in the National Park Service is dispersed geographically and under the primary supervision of more than 300 Park Superintendents. There is minimal information transfer in the fields of resources management and science. Disparities exist between the types and quality of data bases which have been developed to guide resources management in the different parks. There is very little communication between parks on research conducted outside of the park having bearing upon internal problems, and very little communication on the development of problem oriented research and parallel management actions. In addition, there are no means for examining which management actions have been undertaken to document damage to resources or to restore damaged resource conditions. Neither is there a capability to provide for the exchange of information between parks on geographical commonalities of resources management problems.

Relevance to Threats

Information transfer and management are vital in a systematic approach to natural and cultural resources management. Problem mitigation can be achieved, at least partially, with an energetic program conceived in a reactive mode, but a sound, scientifically based resources management program that provides both threat mitigation and prevention must include sound information transfer and management as a principal component.

What We Propose

The National Park Service intends to develop an automated Resources Management Tracking System which can be cross-referenced and used to support resources management activities Servicewide. It will use the Projects Statements, that include all of the park's problems and other resources management activities, as the basis for the system of tracking all related maintenance, protection, monitoring and research activities and results.

Attachment 8 EARLY WARNING/CONSULTATION/RESPONSE TEAMS

Objective

To enhance the ability of parks to deal with problem mitigation by providing special NPS teams that would be available for consultation, interface with other agencies/organizations, and on-site review and assistance.

Existing Situation

Although NPS Regional Office staffs are available to assist the parks in certain forms of threats mitigation activities upon request, responsibilities in Regional Offices in this broad area are fragmented and coordination and communications inadequate (as recently stated in a memo from NPS Regional Director, Western Region). We lack a working, multidisciplinary team of specialists to investigate problems in the field on special requests.

Relevance to Threats

Many of the internal and external threats to park resources can be prevented or mitigated if early warnings are adequately addressed. But most parks do not have sufficient expertise available, and most requests for assistance from Regional Offices are only partially answered.

What We Propose

The Service will develop a plan for creation of one or more interdisciplinary Early Warning and Response Teams that would serve individual parks in the following ways: 1) they would serve as a SWAT team to address selected resources management problems, 2) they would monitor and gather information about demographic growth and development trends to identify threats before they reach a crisis stage, thus providing an early warning system for

parks, and 3) they would develop a strategy for regional responses to those threats which cannot be addressed by individual parks, but are most appropriately addressed by regional action.

Objective

To assess the present status of NPS Cooperative Park Study Units in relationship to Servicewide research and monitoring program needs, and, if necessary, to develop and implement an accelerated schedule of establishment of additional units across the Nation to address Service needs pertaining to threats to park natural and cultural resources.

Existing Situation

The National Park Service, through cooperative agreements with universities and other institutions of higher learning, has in recent years established approximately 27 Cooperative Park Study Units (CPSUs) at those institutions for the purpose of facilitating research and providing better technical assistance to the parks. The Units provide an interface between the Service and the university faculty promoting the efficient acquisition of needed research and technical assistance based on funding availability. CPSUs also can provide specialized training for agency employees as required in the fields of natural and cultural resources management and science.

Relevance to Threats

If the Service is to properly fulfill its mandates to preserve, protect and manage park resources, it must improve its capabilities to better qualify and document the impacts of various threats. This will require that the Service significantly expand its research capabilities. At the present time, the natural science research program is base funded at a level of only \$9 million and is staffed by fewer than 100 scientists; this is an average of less than one researcher for each three parks and represents only 1.1 percent of the total NPS staff. Furthermore, many of

these positions are dedicated to an administrative function as opposed to on-the-ground research in the parks. Therefore, the Service recognized the need to greatly expand its research capability, and this may best be facilitated by the continued operation of CPSUs, and can be improved by giving them better support and increasing their numbers.

What We Propose

The Service will initiate a review of the present funding, staffing and location of CPSUs to determine the effectiveness of the program being undertaken, and the appropriate measures necessary to increase the staffing and funding of existing Units and acceleration of additional Units at the most strategic locations. In addition, the Service will seek specific Congressional legislation providing additional authority to establish such Units and authorize the appropriation of such sums as may be necessary to operate them effectively. Both the U.S. Forest Service and U.S. Fish and Wildlife Service currently possess such authority and funding for units performing similar functions for those agencies.

Attachment 10 SCIENCE PROGRAM REVIEW BY THE NATIONAL ACADEMY OF SCIENCES

Objective

To assess the manner in which implementation of science and technology activities can best serve the needs of the National Park Service in protecting its natural and cultural resources.

Existing Situation

During the summer of 1980 the Service approached the National Academy of Sciences to convene a panel of experts to discuss (1) the historical development of the natural science program within the Service, (2) the diversity of environmental problems facing the Service today, and (3) the current science and technology program activities designed to address these problems.

The panel agreed on the need for a science program which was directed toward supplying sound expertise to resources managers for use in making decisions, documenting the status of resources, and in monitoring impacts to these resources. The panel was directed to prepare a plan for an in-depth study of the Service science program. It was specifically instructed to consider the decentralized administrative structure of the Service, so that the resulting proposal would maximize efficient use of this existing structure.

In October 1980 the National Academy of Sciences and its panel came forward with a proposed plan for the in-depth study.

Relevance to Threats

The expert panel stated that the examination of the current Service information needs would be an important aspect of any potential study they would conduct. This encompasses the verification of the available data bases in parks compiled through inventories, monitoring, and research. The review

of the orientation, structure, and functioning of the NPS science and technology program could potentially bring out the most efficient means for providing the Service with information needs related to threats documentation and mitigation.

What We Propose

The National Park Service plans to fund the National Academy of Sciences proposal to investigate the role of science and technology in the Service and its relationship to natural resources management. Some of the topics which will be addressed include: park and regional research needs; priorities for inventory, monitoring, and other scientific functions; and documentation, information management, and coordination between regions and parks.

The overall structure and function of the science and technology program will be examined with respect to immediate threats to the parks, general research needs, quality control, the application of findings to resource management activities, the role and quality of the Resources Management Plan, and the resources management operations functions. Also, the organizational structure of the Service's science and technology program will be assessed; specifically, the relationship of the Washington Office, Regional Offices and the parks in the identification and prioritization of research needs and in the implementation of the program, including interagency coordination. The Academy also proposes to study the policies and programs of the Service's science and technology program to determine the influence these have on project development and use of results. They will also examine staffing issues, incentives, and budget allocations and procedures.

The results of this investigation are proposed to be available eighteen months after the starting date.

Attachment 11

Number of Monitoring/Research Activities and Corrective Activities Reported by the Parks for the Air Pollution Threat Category.

A I R P O L L U T I O N						
<u>Subcategory</u>	<u>Monitoring/Research Activities</u>			<u>Corrective Activities</u>		
	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>
Smoke	7	8	3	1	1	0
Dust	4	3	3	3	3	1
Chemicals	14	11	5	0	2	2
Fog	1	1	1	0	0	0
CO	4	6	2	3	5	1
CO ₂	1	1	0	0	0	0
Hydrocarbons	4	5	1	4	4	0
Acid Rain	16	14	23	1	2	1
NO _x	1	2	0	0	0	0
Odors	1	1	1	3	4	1
Radioactivity	3	3	0	0	0	0
Other	26	25	9	3	2	2
TOTAL	82	80	48	18	23	9

Attachment 12

Number of Monitoring/Research Activities and Corrective
Activities Reported by the Parks for the Water Pollution
Threat Category.

W A T E R P O L L U T I O N						
<u>Subcategory</u>	<u>Monitoring/Research Activities</u>			<u>Corrective Activities</u>		
	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>
Inorganic	10	12	3	6	5	0
Organic	12	14	1	9	8	3
Salt/Sediment Deposition	12	8	18	6	6	3
Thermal Discharge	2	1	1	0	0	0
Unnatural Flooding and Flow Decrease	12	11	7	9	6	4
Oil Spills	3	5	1	3	3	2
Radioactivity	4	3	0	0	0	0
Acid Mine Drainage	4	2	1	1	1	0
Toxic Chemicals	6	6	2	2	1	1
Other	17	15	8	2	1	2
TOTAL	82	77	42	38	31	15

Attachment 13

Number of Monitoring/Research Activities and Corrective Activities Reported by the Parks for the Aesthetic Degradation Threat Category.

A E S T H E T I C D E G R A D A T I O N						
<u>Subcategory</u>	<u>Monitoring/Research Activities</u>			<u>Corrective Activities</u>		
	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>
Mineral Surveys/ Develop/Extraction	5	5	2	4	4	5
Logging	4	4	1	9	9	2
Grazing/Agriculture	6	5	1	7	6	3
Forest Disease/ Pest Infestations	12	12	0	8	10	1
Wildland Fires	11	11	1	6	5	2
Land Development	13	10	7	16	13	9
Utility Access	7	5	4	10	10	2
Roads + Railroads	1	2	0	7	10	9
Vista-Road Signs	7	8	1	16	13	5
Urban Encroachment	11	9	1	14	18	7
Overcrowding/Vandalism	5	4	3	21	18	16
Other	0	0	1	1	1	0
TOTAL	82	75	22	119	117	63

Attachment 14

Number of Monitoring/Research Activities and Corrective Activities Reported by the Parks for the Physical Removal of Resources Threat Category.

P H Y S I C A L R E M O V A L o f R E S O U R C E S						
<u>Subcategory</u>	<u>Monitoring/Research Activities</u>			<u>Corrective Activities</u>		
	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>
Logging	8	5	2	7	5	1
Mineral Extraction	3	5	1	2	3	0
Gas/Oil Extraction	2	2	2	1	0	3
Hunting/Poaching	11	9	0	6	7	1
Fishing/Poaching	7	5	2	4	4	2
Grazing	4	5	1	6	5	4
Excesses and Abuses of Native American Religious Gathering	0	0	0	2	4	4
Soil Erosion	14	9	18	16	22	6
Fire/Landslides/ Other Catastrophes	4	4	1	6	7	3
Specimen Collecting	3	3	0	11	11	3
Illegal Collecting at Archeological Sites	7	7	13	12	13	23
Other	0	0	9	17	19	19
TOTAL	63	54	49	90	100	69

Attachment 15

Number of Monitoring/Research Activities and Corrective Activities Reported by the Parks for the Exotic Encroachment Threat Category.

E X O T I C E N C R O A C H M E N T

<u>Subcategory</u>	<u>Monitoring/Research Activities</u>			<u>Corrective Activities</u>		
	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>
Animals	18	15	11	17	19	3
Plants	8	9	5	16	15	3
Unnatural Fire	5	5	1	10	11	8
Noise:Motor Vehicle	3	3	0	7	4	3
Noise:Aircraft	6	8	2	3	3	1
Noise:Industrial	1	1	1	1	0	2
Noise:Visitor	0	0	0	1	1	0
Seismic Blasting, etc.	2	2	6	1	1	2
Other	0	0	0	0	2	0
TOTAL	43	43	26	56	56	22

Attachment 16

Number of Monitoring/Research Activities and Corrective Activities Reported by the Parks for the Visitor Physical Impacts Threat Category.

V I S I T O R P H Y S I C A L I M P A C T S						
<u>Subcategory</u>	<u>Monitoring/Research Activities</u>			<u>Corrective Activities</u>		
	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>
Campfires	3	2	2	6	7	2
Trampling	13	11	9	21	21	9
Erosion	9	11	3	22	21	2
Wildlife Harassment	8	7	3	7	5	3
Habitat Destruction	4	5	2	9	10	1
X-Country Skiing	1	1	0	0	0	0
ORV's	4	4	1	7	5	6
Subtle Influences	7	6	3	2	3	7
Other	1	0	2	6	6	7
TOTAL	50	47	25	80	78	37

Attachment 17

Number of Monitoring/Research Activities and Corrective Activities Reported by the Parks for the Park Operations Threat Category.

P A R K O P E R A T I O N S						
<u>Subcategory</u>	<u>Monitoring/Research Activities</u>			<u>Corrective Activities</u>		
	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>	<u>Underway FY80</u>	<u>Planned FY81</u>	<u>Requires Funding</u>
Roads and Utility Corridors	6	5	6	10	8	3
Trails	4	2	3	7	8	1
Facilities	8	4	7	8	10	4
Research	3	1	5	2	3	2
Suppression of Natural Fires	7	5	3	1	4	5
Misuse of Biocides	4	3	0	2	3	0
Employee Ignorance	0	1	4	12	15	8
Political Pressure	0	0	0	4	3	2
Other	4	6	13	8	8	17
TOTAL	36	27	41	54	62	42

Air pollution has a marked effect on both the cultural and natural resources within parks, even though it is often associated with facilities located considerable distances from park boundaries. On Table 1, the air pollution threats category shows the most monitoring/research activities, underway or planned, were reported; yet, the fewest corrective activities were reported among all other threats. The reasons for this disparity can be explained. Air pollution monitoring equipment and stations, owned and operated by other Federal agencies such as the Environmental Protection Agency or the U.S. Army as part of a national network, are often located within parks; thus, the amount of research/monitoring activity indicated in Table 1 is higher than would be shown by Service activities alone. However, because air pollution is usually an external threat to the park resources, the parks have little recourse other than to report violations to appropriate agencies and to work with municipal, State and Federal agencies and/or private interest groups on air quality problems.

The majority of parks use three methods of air quality monitoring: automatic systems, such as telephotometers and particulate samplers; manual systems involving similar equipment; and visual reports, usually made by Park Rangers. All of these correlate visibility with wind direction in relation to the location of the air pollution source. While many of these monitoring systems are owned and operated by other agencies or organizations, most parks expressed an interest in purchasing their own equipment for monitoring air quality and related conditions.

The major source of air pollution was industry. Coal-fired generating

plants were cited most often as the source of acid rain and chemical particulates.

Pollutants from such industrial sources as smelting operations, paper and pulp mills, and coastal industries were reported by Chiricahua NM, Olympic NP, and North Cascades NP, respectively. Chemical fertilizers, pesticides, and crop dusting, additional sources of chemical particulate pollution, were mentioned frequently by parks including Grand Canyon NP, Olympic NP, and Whitman Missions NHS.

Attachment 11 shows that the majority of mitigating activities for air pollution fell under the acid rain, chemical particulates and other sub-categories. Of those parks taking corrective measures, the most frequently reported activity was working with outside groups on controlling the source. Jean Lafitte NHP&R and Fort Smith NHS reported working with municipal, industrial and Federal agencies to improve air quality.

Parks with structures affected by acid rain reported such corrective measures as steam cleaning, or, as JFK Center for the Performing Arts reported, replacing fabrics, or otherwise treating the damaged objects. Collections of artifacts at Mound City Group NM were encased along with silica gel, a drying agent, to prevent deterioration from chemical particulates and humidity.

Motor vehicles were the second major source of pollution responsible for emission of hydrocarbons, CO, CO₂, and NO_x which threaten visibility and chemical air quality. Most parks are monitoring for these pollutants or are requesting funds to install monitoring equipment. Corrective measures reported most often for hydrocarbon and CO pollution were: rerouting of traffic, such as at Ford's Theatre NHS and Rock Creek Park, and providing free shuttle bus service as at Grand Canyon NP.

Dust usually was attributed to industrial activities; however, at Fort Smith NHS it was attributed to agricultural practices, and at Redwood NP, the dust problem is due to road traffic. El Morro NM cites sand as the culprit. Most of the parks have treated park roads in an effort to decrease the dust problem. Klondike Gold Rush NHP applies oil and CaCl_2 as a treatment procedure.

Slash burning was reported as the major source of smoke pollution, fires and industry were secondary. Monitoring of smoke is underway in most parks. Crater Lake NP has identified specific areas where burning will be prohibited. Many parks reported smoke management plans in either planning or implementation stages.

Odors are usually derived from industry and motor vehicles but have been attributed to local dairies near Whitman Missions NHS, urban sprawl at Cabrillo NM, and garbage dumps at Canyon de Chelly NM. Most parks monitor odors and many work with local groups to solve problems. Resources threatened include the backcountry and frontcountry experience, and visitor and employee health and safety.

Radioactivity was also listed as a threat to the health and safety of visitors and employees. In most instances the sources of radioactivity were natural, and monitoring of NPS employees was the approved method to assess safety. The White House cited microwave transmissions around the city as the source of radioactivity monitored there. Indiana Dunes NL developed a lakeshore evacuation plan as a mitigating activity.

Fog has been implicated as the source of salt deposits on structures at Padre Island NS. Fog encourages rust and fungal growth; both are agents of artifact deterioration. Mitigating activities include identifying objects affected by fog and developing proper treatment methods.

Parks Reporting Monitoring/Research Activities and Corrective Activities for the Air Pollution Threat Category

ACID RAIN					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
INDU	INDU	INDU	JOFK	SAAN	PERI
CHCA	CHCA	ALIB		JOFK	
SAAN	HUTR	ASRU			
HAFE	SAAN	BAND			
JOFK	HAFE	BUFF			
NOCA	JOFK	CACH			
OLYM	NOCA	CACA			
APIS	OLYM	CHCA			
VOYA	VOYA	ELMO			
GRPO	GRPO	FOSH			
ISRO	ISRO	GICL			
SLBE	SLBE	HUTR			
CACO	CACO	JELA			
SHEN	MOHC	NAVA			
MOHC		PERI			
ORPI		SAAN			
		WAPA			
		SACH			
		JEFF			
		GRPO			
		BITH			
		CAMO			
		WNSA			
TOTAL	16	14	1	2	1

SMOKE					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
MORA	CRIC	CHIC	CRLA	CRLA	
NOCA	MORA	REDW			
OLYM	OLYM	TUMA			
WAPA	GRPO				
MOHC	WAPA				
REDW	MOHC				
INDU	REDW				
	INDU				
TOTAL	7	8	1	1	0

HYDROCARBONS					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
ISRO	GMMP	TUMA	ANAC	ANAC	
MOHC	ISRO		OXCO	OXCO	
LECA	MOHC		KLGO	KLGO	
INDU	LECA		GRCA	GRCA	
	INDU				
TOTAL	4	5	4	4	0

CO ₂					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
MOHC	MOHC				
TOTAL	1	1	0	0	0

NO _x					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
MOHC	MOHC				
	GMMP				
TOTAL	1	2	0	0	0

FOG					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
MOHC	MOHC	PAIS			PAIS
TOTAL	1	1	0	0	1

Parks Reporting Monitoring/Research Activities and Corrective Activities for the Air Pollution Threat Category

DUST					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
INDU	INDU	ELMO	NOCA	NOCA	REDW
OLYM	OLYM	GRPO	KLGO	KIGO	
MOHC	MOHC	TUMA	REDW	REDW	
ORPI					
TOTAL	4	3	3	3	1

RADIOACTIVITY					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
MIHO	MIHO				
MOHC	MOHC				
LECA	LECA				
TOTAL	3	0	0	0	0

CO					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
HAVI	CHIC	CHIC	HOSP	GRCA	GRCA
ROCR	HOSP	HOSP	JOFK	HOSP	
MOHC	GWRP		FOTH	JOFK	
YOSE	INDU			FOTH	
	HAVI			ROCR	
	MOHC				
TOTAL	4	2	3	5	1

ODORS					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
CABR	CABR	GRPO	JELA	FOSH	JELA
			JOFK	JELA	
			FOTH	JOFK	
				FOTH	
TOTAL	1	1	1	4	1

CHEMICAL PARTICULATES					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
WACA	WACA	INDU		JOFK	CACH
INDU	INDU	PAIS		ROCR	PAIS
JOFK	ARHO	MOCI			
HAVI	THRI	GRPO			
ROCR	HAVI	PEFO			
MORA	MORA				
OLYM	OLYM				
VOYA	VOYA				
VAFO	MOHC				
MOHC	PEFO				
YOSE	LECA				
ORPI					
LECA					
LAME					
TOTAL	14	5	0	2	2

OTHER					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
HAFE	HAFE	INDU	JELA	JELA	FOSH
CRMO	MIHI	AMIS	MOCI	MOCI	MOCI
MIHI	EFMO	BAND	PEVI		
EFMO	ISRO	FOSH			
ISRO	ACAD	GICL			
ACAD	SHEN	NAVA			
MIISA	MOHC	WUPA			
MOHC	INDU	CHIR			
INDU	PORE	SAMO			
PORE	DEVA				
DEVA	TONT				
TONT	WUPA				
JOTR	PUHO				
NAVA	TUMA				
TUMA	AZRU				
PEFO	GRCA				
GRCA	BAND				
BAND	BIBE				
BIBE	BITH				
BITH	BUFF				
BUFF	CACA				
CACA	GUMO				
GUMO	CAHO				
CAHO	CHCA				
CHCA	GICL				
GICL					
TOTAL	26	9	3	2	2

Water pollution problems were attributed in large part to external sources, although not to as high a degree as air pollution. Table 1 shows that the numbers of monitoring/research activities in the water pollution category are comparable to those in the air pollution category. This similarity, in part, is because Joshua Tree NM, Death Valley NM, Olympic NP, and many other parks are sites for water quality monitoring stations administered by the U.S. Geological Survey or the Environmental Protection Agency. Also similar to air pollution mitigation, parks affected by external activities that degrade water quality can report violations and work with outside groups for improvements. The increase in the number of corrective activities for water pollution, as compared to air pollution, may indicate that parks have more control over water than air.

Attachment 12 shows a breakdown in the distribution of research/monitoring activities and corrective activities reported for water quality threats, as discussed below.

Inorganic water pollution problems stem from both point and non-point sources. Glacier NP is an example where outside logging, a non-point source, is causing leaching of nitrates and phosphates into the park. Everglades NP receives inorganic pollutants from agricultural activities upstream, and Antietam NB suffers from nearby construction and fertilizer runoff. Mitigating activities include active participation in water quality improvement, such as at Rock Creek Park where park recommendations to the District of Columbia on improvement of street cleaning reduced inorganic pollution, or as at Catoclin Mountain Park and Mound City Group NM, where outside groups are advised of park concerns. Antietam NB reports water quality violations to EPA.

Organic chemical sources may be internal, as in Glen Canyon NRA where sewage holding tanks from recreational vehicles, boats, and portable sanitation facilities are leaking into the waters of Lake Powell, or external, as at any number of urban park areas, including Catoctin Mountain Park, Cuyahoga Valley NRA, and Indiana Dunes NL. Organic pollution poses an extreme hazard to human health as well as to all animal life. Mound City Group NM reported efforts to voice concerns to other agencies.

Salt deposition occurs in western parks which are suffering from reduced water flow, such as Death Valley NM and Great Sand Dunes NM. Road salting in such northern areas as Indiana Dunes NL and many northern urban parks is also a problem. In excess, salt is detrimental to all levels of the food chain, and is responsible for accelerating the deterioration of structures and artifacts in some parks. Padre Island NS reported treating salt-covered objects and Wupatki NM has prepared a "historic preservation guide" to assist staff in reducing the impact of salt deposition. Indiana Dunes NL reported working with the highway commission to alleviate salt problems. Sediment deposition is also a problem in parks with flooding. Aztec Ruins NM, Oxon Cove Farm, and Kenilworth Gardens are examples of the many parks which cited this as a problem. Sediment deposition is damaging to aquatic systems. Rock Creek Park reported cooperative activities to reduce sediment deposition from construction activities upstream.

Thermal discharge is potentially a problem at parks near power plants with cooling towers or cooling ponds, such as Biscayne NM. Hot water discharge has the potential to alter plant and animal communities, shifting them from their original species composition to those more tolerant of warmer temperature regimes.

Unnatural flooding is caused by such diverse sources as release of impoundment waters above park areas at times of high water, reported by Everglades NP, Dinosaur NM, and Devils Tower NM, and sheetflow over clearcut areas outside park boundaries, reported by Redwoods NP.

Mitigating activities were reported by several parks including Redwood NP which initiated a watershed rehabilitation program and Big Bend NP where construction of a dike will control flooding from overflow of Mexican dams.

Unnatural flow decrease has become a problem due to aquifer draw-down at Curecanti RA, Death Valley NM, and other arid land parks, especially those along the Colorado River. Hot Springs NP reported working to maintain reservoir levels to prevent flow decrease.

Oil spills from external sources pose a constant threat to coastal park areas. Padre Island NS, Fire Island NS, Channel Islands NS, Olympic NP, and Gulf Islands NS are just a few examples. Glacier NP and Theodore Roosevelt NP reported concerns about potential oil and gas leasing near their boundaries. Internal oil spills have been caused by recreational vehicles at Bighorn Canyon NRA and Devils Tower NM. Oil is toxic and harmful to birds, fish, mammals, and plant life. Parks reporting mitigating activities include Crater Lake NP which has initiated a boat refueling plan and daily boat inspections, to prevent spills from refueling accidents and leaks. George Washington Memorial Parkway reported participation in spill clean-up and expansion of protection/prevention efforts, and Ebey's Landing NHR reported activities to educate State and local officials on oil spill hazards.

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Water related threats to cultural resources reported were the lack of gutters at San Antonio Missions NHP resulting in structural erosion, or the exposure of artifacts by flooding at Padre Island NS. Apostle Islands NL met with representatives of the boating industry to try to improve understanding about water pollution and other destructive boating activities.

Parks Reporting the Status of Monitoring/Research and Corrective Activities by Subcategory for the Water Pollution Category.

ORGANIC						
Status						
Monitoring/Research Activities			Corrective Activities			
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding	
ROCR	PRWI	SACH	ANTI	ANTI	GRPO	
VOYA	ROCR		CATO	CATO	JOMU	
PIPE	VOYA		CHOH	KEAQ	YOSE	
OZAR	PIPE		KEAQ	ROCR		
SLBE	OZAR		ROCR	MOCI		
GETT	CUVA		SACH	GRPO		
ASIS	SLBE		MOCI	JOMU		
UPDE	GETT		JOMU	YOSE		
MOCA	ASIS		YOSE			
PEFO	UPDE					
GRCA	MOCA					
INDU	JOMU					
	GRCA					
	INDU					
TOTAL	12	14	1	9	8	3

OIL SPILLS						
Status						
Monitoring/Research Activities			Corrective Activities			
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding	
PRWI	PRWI	REDW	GWMP	GWMP	KJGO	
UPDE	CUVA		PEVI	THRI	SITY	
REDW	UPDE		CRLA	ERLA		
	REDW					
	CRLA					
TOTAL	3	5	1	3	3	2

TOXIC CHEMICALS					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
HOSP	HOSP	HOSP	HOSP	HOSP	HOSP
OZAR	OZAR	PECO	ANTI		
SLBE	CUVA				
UPDE	UPDE				
MOMC	ORFI				
INDU	INDU				
TOTAL	6	6	2	1	1

INORGANIC						
Status						
Monitoring/Research Activities			Corrective Activities			
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding	
PRWI	GWMP	SACH	ANTI	ANTI		
ROCR	PRWI	GRPO	CATO	CATO		
VOYA	ROCR	REDW	KEAQ	KEAQ		
PIPE	ERLA		ROCR	ROCR		
OZAR	VOYA		SACH	MOCI		
SLBE	PIPE		MOCI			
UPDE	OZAR					
REDW	CUVA					
PEFO	SLBE					
INDU	UPDE					
	REDW					
	INDU					
TOTAL	10	12	3	6	5	0

ACID MINE DRAINAGE					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
CHOH	PRWI	REDW	PRWI	PRWI	
PRWI	REDW				
MOMC					
REDW					
TOTAL	4	2	1	1	0

UNNATURAL FLOODING & FLOW DECREASE					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
GREE	GRMP	BIBE	BIBE	SAAN	FOSM
ROXR	ROCR	CIKA	HOSP	KEAQ	JELA
HEHO	OZAR	FODA	JELA	ROCR	FOIA
ISRO	HEHO	HOSP	LYJO	WOTR	REDW
PEVI	ISRO	VOYA	SAAN	HEHO	
GPCA	GRCA	REDW	CATO	REDW	
SEKI	SEKI	INDU	KEAQ		
MONC	REDW		ROCR		
REDW	DEVA		REDW		
DEVA	ORPI				
ORPI	INDU				
INDU					
TOTAL	12	11	7	9	6

THERMAL DISCHARGE					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
LABE	LABE	LAVO			
YOSE					
TOTAL	2	1	1	0	0

RADIOACTIVITY					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
LECA	LECA				
PEFO	GRCA				
GRCA	INDU				
INDU					
TOTAL	4	3	0	0	0

SALT AND SEDIMENT DEPOSITION					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
SAAN	HUTR	AMIS	FOSM	FOSM	FOSM
GREE	SAAN	AZRU	KEAQ	OXCO	PAIS
CHOH	THRI	BAND	OXCO	PRWI	REDW
THRI	OXCO	BUFF	PRWI	ROCR	
OXCO	PRWI	CACA	ROCR	WOTR	
PRWI	ROCR	CIKA	REDW	REDW	
ROXR	REDW	EIMO			
CUVA	INDU	FODA			
MONC		FOSM			
REDW		GRQU			
YOSE		HUTR			
INDU		NAVA			
		PAIS			
		SAAN			
		PECO			
		WUPA			
		REDW			
		INDU			
TOTAL	12	8	10	6	6

OTHER					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
JELA	OLYM	AZRU	SAAN	SAAN	PAIS
CODA	WIMI	CACA	APIS		SAAN
OLYM	SACH	GPQU			
WIMI	DEVA	PECO			
SLBE	GRCA	APIS			
DEVA	JOTR	PORE			
GRCA	MOCA	TUZI			
JOTR	SEKI	SAMO			
MOCA	YOSE				
SEKI	ORPI				
YOSE	REDW				
WAPA	WAPA				
PORE	INDU				
INDU	LAVO				
LAVO	TUMA				
TUMA					
WHIS					
TOTAL	17	15	8	2	1

Aesthetic degradation and its effect on park values and the visitor experience, occur from both internal and external sources. Table 1 shows that while the number of monitoring/research activities under the aesthetic degradation category are similar to those reported for air and water pollution, differences in the numbers of corrective activities are substantial. In fact, corrective activities for aesthetic degradation are greater than for the other two categories combined. Many of the corrective activities deal with public relations, community planning input, increased ranger patrol, and at best, acquiring land as buffer zones. Attachment 13 gives a further breakdown in the distribution of research/monitoring and corrective activities.

Land development has the potential to impact any of the aesthetic, cultural, physical and biological resources within a park. The greatest number of threats reported fell under this subcategory, derived mostly from outside the park. Parks apparently are rapidly losing the buffer areas that once provided protection, due to increasing population demands on resources and changing land use patterns, which are endangering park resources and park values. Zion NP reported internal threats to park aesthetics from possible property development on inholdings. External threats were reported by Acadia NP, Everglades NP, Yellowstone NP, Pipe Spring NM, Glacier NP, and others from commercial, industrial, or residential development in close proximity to park boundaries. Mitigating activities include planting around parks to block unsightly areas, or as reported at North Cascades NP and Grand Portage NM, working with local groups and serving on land use planning committees. Indiana Dunes NL reported purchase of scenic easements for

buffer zones as a corrective measure. Although the vistas from within the parks are free from obstruction in many cases, adjacent land development has literally made islands of some of the larger parks such that park flora and fauna are contained.

Utility access, seen in parks as powerlines, gas and oil pipelines, or telephone lines, is of concern in several parks including Badlands NP, Bighorn Canyon NRA, and Gettysburg NMP. Padre Island NS has pipelines which are degrading to the park experience as well as posing a hazard to resources in the event of leakage. Utilities within parks should be placed underground, where feasible, as explained in the NPS Management Policies (Section VII-16). Petrified Forest NP reported replacing overhead with underground lines. Palo Alto Battlefield NHS plans to reroute the powerlines causing aesthetic degradation. Maintenance of utility rights-of-way by chemical or mechanical methods has the potential to damage aesthetic qualities of parks as well as plant and animal communities in the vicinity. Prince William Forest Park reported that efforts to close and revegetate utility entrances were underway to prevent unauthorized access to the park.

Roads and railroads can be a threat to the aesthetic enjoyment of both natural and cultural resources. In natural areas, they disrupt the vista and frequently by their construction alone, create a habitat for the invasion of non-native weed species. In cultural or historical areas, they often disturb the historic setting and threaten the park experience. Wupatki NM reported possible threats from an existing railroad. Road and railroad maintenance activities may be contrary to park purposes, but are often prerequisite for public use of parks which necessitates facilities for travel. Badlands NP reported threats from paving the rim road. Corrective actions, using plantings to decrease visibility, were reported at Palo Alto Battlefield NHS. Canyon de Chelly NM reported working with the Bureau of Indian Affairs

and the Navajo Tribe for a road by-pass route. In addition, removal of unsightly trash along the Chesapeake and Ohio Canal NHP railroad was reported as a corrective measure.

Urban encroachment impacts are extensive in both direct and indirect effects on park resources and visitor experiences. Direct threats from urban encroachment may be manifested by an industrial center, such as the one proposed in close proximity to Arches NP, or by an increased rate of suburban growth, as at Hampton NHS. Chattahoochee River NRA and Delaware Water Gap NRA both reported threats from urban sprawl. Pipestone NM reported attending city and county zoning meetings to deal with urban encroachment. Fort Davis NHS, Palo Alto Battlefield NHS, and Harpers Ferry NHP each reported corrective activities by seeking scenic easements. Fort Scott NHS added plantings around the park to hide the urban scene.

It is obvious that the general vista is changed by urban encroachment, but the long-range, indirect effects such as degradation of air and water quality or the loss of plant and animal habitat must also be of concern. These impacts are magnified in parks near urban centers. Parks near urban centers are suffering from increased visitation because they are readily accessible and have many recreational opportunities.

It is not surprising that parks such as Gateway NRA and Golden Gate NRA must confront the inherent problems associated with large urban populations, namely overcrowding and vandalism. Overcrowding stresses the already over-used park resources and magnifies all of the threats reported under visitor physical impacts. Vandalism was reported as a problem in Saratoga NHP, Adams NHS, and Great Sand Dunes NM, to mention only a few where cultural resources were the concern. Alleviation of overcrowding was accomplished in part by regulating visitor numbers or access at Indiana Dunes NL

and by limiting tour size at Lehman Cave NM. Corrective activities for vandalism problems include increasing the ranger patrol at Effigy Mounds NM and Sitka NHP. The JFK Center for the Performing Arts has removed all lightweight objects from display to discourage vandalism and Harpers Ferry NHP reported increasing stabilization of structures prone to vandalism.

Road signs and inholdings are reported to be impacting the natural scene at Badlands NP, Olympic NP, and Point Reyes NS, and the historical scene at Harpers Ferry NHP and Perry's Victory and International Peace Memorial. These threats are ramifications of the larger problem of urban encroachment. Inholdings are a potential threat in many of the parks and are cited under many of the other categories. Mitigation activities include removal of structures and habitat restoration at Indiana Dunes NL, and denial of additional building permits by the U.S. Army Corps of Engineers at Effigy Mounds NM.

Consumptive utilization of non-renewable mineral resources (gravel, bauxite, bentonite, copper, gold, lead, potash, uranium, etc.) through mineral surveys, development and extraction are actions that are inconsistent with Service policies, unless mining is permitted in the park enabling legislation. The impacts of mineral development are far-reaching, whether the development is internal or external to the park. Aesthetic qualities of parks are severely altered by mining which in turn affects visitor experience. Water quality is threatened by mining activities; therefore, many of the biological communities within the park can be in danger. Indiana Dunes NL reported that sand mining threatens park soils and the beach/dune system. Proposed mining in Glacier NP was reported as a

potential threat to the aesthetic qualities of the park. The corrective activity most reported was acquisition of mining sites or claims that are potential or realized hazards to park resources. North Cascades NP, Big Bend NP, and Chiricahua NM each reported progress in such acquisitions.

Grazing and agriculture were reported as threats to the general scene at Badlands NP where trespass cattle are altering the natural scene, at Bighorn Canyon NRA where cattle and wild horses are overgrazing park lands, and at Rocky Mountain NP where long term grazing rights are of concern. Agricultural activities along the Upper Delaware S&RR were reported as a threat. Golden Gate NRA reported establishing test plots to assess the impacts of grazing, and Palo Alto Battlefield NHS reported efforts to acquire the agricultural land causing problems.

Forest disease and pest infestations each have the potential to adversely affect the view and in turn visitor experience. In natural areas, such as Shenandoah NP, gypsy moth infestations can denude large sections of forest. The pine beetle was reported as a threat to both natural and cultural landscapes in areas such as Mt. Rushmore NM, Devils Tower NM, and Carl Sandburg NHS. Badlands NP reported the brown trout as a pest species and Great Sand Dunes NM reported porcupines as a threat to piñon pine stands. Cultural resources, as at Christiansted NHS, are sometimes threatened by termite infestations. Dutch Elm disease was cited as a threat at the White House. Mitigating activities in parks range from identification of pathogens at Hawaii Volcanoes NP, to physical removal of diseased trees at Chesapeake and Ohio Canal NHP, to consideration of an "integrated pest management" strategy as reported for rat problems at National Capital Parks Central.

Wildland fires, or naturally caused fires, are an integral part of the ecological processes in many of our parks; in fact, fire cycles maintain certain vegetation types and wildlife habitats. Everglades NP or Redwoods NP both contain good examples of fire-maintained ecosystems. However, some parks view wildland fires not from a strictly benevolent viewpoint.

Wildland fires were reported as a threat to present park scenic qualities, as at Bighorn Canyon NRA, or as a threat to the stabilizing vegetation of river bottoms at Canyonlands NP. The occurrence of wildland fires in parks such as Catcctin Mountain or Golden Gate NRA, where cultural resources, landscapes, and existing structures can be threatened by a wildland fire, is of concern. Oregon Caves NM and Whiskeytown NRA reported fuel reduction activities to mitigate threats from wildfire, and John Muir NHS reported discing in appropriate areas as a protective measure. "Suppression" of natural fires is discussed under the park operations threat category.

Consumptive utilization of renewable resources such as logging is contrary to Service policy; however, several parks reported threats in this subcategory. The logging operations of corporate and private landowners adjacent to parks or on park inholdings pose a threat to the natural scene as well as biological and physical park resources. Bryce Canyon NP reported threats from the harvesting operations of the U.S. Forest Service and the Bureau of Land Management. Rocky Mountain NP, Yellowstone NP, and New River Gorge NR reported threats from harvesting of timber by clearcutting, and Ice Age NSR listed inholdings as a threat. Indiana Dunes NL reported efforts to rehabilitate altered areas, while Coulee Dam RA and Ebey's Landing NHR reported efforts to increase public awareness of problems associated with logging, in addition to working with outside groups to mitigate logging threats. Logging is also discussed under the physical removal of resources threat category.

Deterioration of structures by weathering, reported by Lava Beds NM and the National Visitor's Center, falls under the other subcategory. Fort Smith NHS also reported weathering of artifacts as a threat. Repairing deteriorated structures and shielding artifacts from the elements were the corrective measures most often reported for these problems.

Parks Reporting the Status of Monitoring/Research and Corrective Activities by Subcategory for the Aesthetic Degradation Category.

LAND DEVELOPMENT						
Status						
Monitoring/Research Activities			Corrective Activities			
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding	
INDU	CATO	AZRU	ALIB	BUFF	ELMO	
CATO	ROCR	GRQU	BUFF	FOSH	FODA	
PRWI	CODA	HOSP	INDU	ANTI	JELA	
ROCR	SHEN	NAVA	FOSH	MONO	LYJO	
CODA	HALE	PECO	ANTI	CATO	PAAL	
WICR	HAVO	TUMA	MONO	HAFE	SAAN	
PEVI	WAPA	ORPI	CATO	MANA	TUMA	
SHEN	CABR		HAFE	ROCR	GRPO	
HALE	SAMO		PRWI	CODA	KLGO	
HAVO	YOSE		ROCR	EBLA		
LAME			CODA	NOCA		
KLGO			NOCA	OLYM		
CABR			OLYM	GRPO		
			SACN			
			GRPO			
			JOTR			
TOTAL	11	10	7	16	13	9

OVERCROWDING/VANDALISM						
Status						
Monitoring/Research Activities			Corrective Activities			
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding	
LAME	INDU	CHCA	INDU	INDU	AMIS	
INDU	GICL	TUMA	CHIC	CHIC	BAND	
CATO	CATO	GICL	FOSH	HOSP	BUFF	
WOTR	KATH		HOSP	HUTR	CACA	
KATH			HUTR	CATO	TUMA	
			CATO	GWMP	ELHO	
			GWMP	HAFE	FOSH	
			HAFE	JOFK	GRQU	
			JOFK	MANA	HOSP	
			MANA	FOTH	HUTR	
			FOTH	FOCI	NAVA	
			FOCI	FOWA	PECO	
			FOWA	FRDO	SAAN	
			KEAQ	PRWI	WHSA	
			PRWI	JEFF	WUPA	
			MEHI	FOLA	JEFF	
			FOLA	SITK		
			SITK	SLBE		
			NACC			
			CUVA			
			SLBE			
TOTAL	5	4	3	21	18	16

URBAN ENCROACHMENT						
Status						
Monitoring/Research Activities			Corrective Activities			
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding	
INDU	CATO	SAMO	CACH	CACH	FODA	
CATO	NAVI		FOSH	INDU	JELA	
NAVI	ROCR		MONO	FOSH	PAAL	
ROCR	FOSC		CATO	MONO	PERI	
FOSC	PIRO		GWMP	CATO	SAAN	
PIRO	LAVO		HAFE	GWMP	SCBL	
PEVI	HALE		FOCI	THRI	HEHO	
LAVO	HAVO		ROCR	HAFE		
HALE	SAMO		SACN	MANA		
HAVO			PIPE	FOCI		
PEFO			FOSC	FOWA		
			EFMO	ROCR		
			YOSE	EBLA		
			PEFO	PIPE		
				FOSC		
				EFMO		
				YOSE		
				ORPI		
TOTAL	11	9	1	14	18	7

UTILITY ACCESS						
Status						
Monitoring/Research Activities			Corrective Activities			
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding	
GRCA	GRCA	AMIS	CACH	CACH	PAAL	
GWMP	GWMP	BAND	CHIC	WHHO	LIHO	
SUIT	SUIT	ELMO	PAAL	ANAC		
NOCA	NOCA	FOSH	WHHO	SUIT		
GRPO	GRPO		SUIT	PRWI		
WICR			PRWI	EBLA		
SLBE			FOLA	FOLA		
			MOMC	MOMC		
			YOSE	YOSE		
			PEFO	PEFO		
TOTAL	7	5	4	10	10	2

Aesthetic Degradation Category (continued)

VISTA-ROAD SIGNS, INHOLDINGS					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
HUTR	HUTR	HUTR	FOUN	FOSH	FOSH
OLYM	GWMP		HUTR	FOUN	FOUN
PEVI	OLYM		MONO	HUTR	HUTR
ACAD	ACAD		GREE	MONO	GRPO
RICH	RICH		GWMP	GREE	SLBE
PORE	PORE		HAFE	GWMP	
INDU	CRLA		PISC	HAFE	
	INDU		VOYA	VOYA	
			GRPO	GRPO	
			EFMO	EFMO	
			LIHO	WAPA	
			PEVI	LABE	
			WAPA	INDU	
			JOHU		
			LABE		
			INDU		
TOTAL	7	8	1	16	13

WILDLAND FIRES					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
CRMO	INDU	HAVO	GRPO	GRPO	GRPO
ORCA	YOSE		HEHO	HEHO	JOHU
YOSE	GOGA		HAVO	INDU	
GOGA	HAVO		INDU	ORPT	
GRCA	GRCA		GOGA	GOGA	
BIBE	BIBE		WHIS		
BAND	BITH				
BITH	CAMO				
CAMO	CACA				
CACA	GUMO				
GUMO	PAIS				
TOTAL	11	11	1	6	5

LOGGING					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
GRPO	GRPO	REDW	BUFF	BUFF	BUFF
PIRO	PIRO		GWMP	GWMP	REDW
REDW	REDW		CODA	EBLA	
GOGA	GOGA		NOCA	NOCA	
			OLYM	OLYM	
			REDW	REDW	
			GOGA	GOGA	
			CRLA	CRLA	
			INDU	INDU	
TOTAL	4	4	1	9	9

FOREST DISEASE/PEST INFESTATIONS					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
LABE	LABE		FOSH	FOSH	FOSH
CATO	CATO		CATO	CATO	
INDU	INDU		CHOH	CHOH	
GWMP	GWMP		INDU	INDU	
THRI	ARHO		NACC	THRI	
FRDO	FRDO		LIPK	HACC	
LIPK	LIPK		ROCR	FRDO	
PRWI	PRWI		MOCI	LIPK	
ROCR	ROCR			ROCR	
HALE	HALE			MOCI	
HAVO	HAVO				
CRLA	CRLA				
TOTAL	12	12	0	8	10

Aesthetic Degradation Category (continued)

GRAZING OR AGRICULTURE					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
FOBO	REDW	WUPA	CORO	CORO	PAAL
REDW	PORE		GRCA	ORCA	WUPA
ORPI	LECA		TUMA	TUMA	REDW
LECA	GOGA		LAVO	ORPI	
GOGA	GRCA		ORPI	GOGA	
GRCA			GOGA	CRLA	
			CRLA		
TOTAL	6	5	1	7	6

ROADS AND RAILROADS					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
ANAC	ANAC		ALIB	CACH	ALIB
	OXCO		CACH	CORO	FOSH
			CORO	CATO	PAAL
			CATO	CHOH	MAHA
			CHOH	MAHA	LIBO
			WAPA	EBLA	JEFF
			REDW	JEFF	GRPO
				FOSC	GERO
				ASIS	REDW
				WAPA	
				REDW	
TOTAL	1	2	0	7	11

MINERAL SURVEYS, EXTRACTION, ETC.					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
PIRO	PIRO	REDW	ALIB	EBLA	BIBE
MOHC	MOHC	TUZI	INDU	INDU	BUFF
REDW	REDW		NOCA	NOCA	JELA
TOHT	TOHT		DEVA	DEVA	WUPA
PEFO	DEVA				CHIR
TOTAL	5	5	2	4	4

OTHER					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
					LABE
			NAVI	NAVI	FOSH
					JELA
TOTAL	0	0	1	1	2

The physical removal of resources, whether natural or man-induced is for the most part an internal threat to parks. Parks are making a concerted effort to mitigate threats from removal of resources as shown by the large numbers of corrective activities in that category on Table 1. In general, the unauthorized collection of resources, whether animal, plant, or mineral, can be curtailed actively by increasing law enforcement or passively by increasing public awareness. The subcategories reflecting natural events which remove resources also warrant mitigation activities as indicated by Attachment 14.

Soil erosion, the natural process by which soil is moved by wind or water, can pose a threat to park resources in several ways. First, it can be accelerated by human interference such as mining and road construction. At New River Gorge NR, construction has caused increased run-off and subsequent erosion which is threatening the plant and animal communities associated with the river ecosystem. Second, soil erosion can threaten cultural and natural resources, even though it is a natural event, e.g., George Washington Birthplace NM is threatened by erosion and silting from the Potomac River, and structural erosion is reported at Grand Portage NM. Finally, Assateague Island NS and Cape Hatteras NS both reported threats to their shorelines due to the existence of jetties up the coast.

The largest number, as well as widest category of mitigation activities, were reported for the soil erosion subcategory. Anacostia Park reported temporary erosion control measures using gabions and concrete. Capulin Mountain NM cited more permanent actions including installation of drains, removal of one road, and removal of stream debris to alleviate erosion

problems. In addition to clearing stream beds, Greenbelt Park reported to be reseeding parklands to stabilize soils. Buffalo NR and Jefferson NEM NHS also reported stabilization efforts by plantings. Whiskeytown NRA reported that proper road grading improved potential erosion sites, and Redwood NP reported continuing efforts to prevent destructive timber harvesting external to park boundaries and the resulting erosion, by setting timber harvest guidelines.

Examples of internal threats to park resources fall partially into sub-categories dealing with the unauthorized collection of resources by park visitors. Illegal collecting at archeological sites is a problem at Isle Royale NP where commercial and sport scuba divers are removing large quantities of artifacts from shipwrecks. Several parks, including Ozark NSR, reported threats from "pot hunters", and paleontological features at Badlands NP are threatened by excessive fossil collecting. At Glen Canyon NRA, boats and off-road vehicles facilitate access to and transport of archeological resources.

Threats to parks from specimen collecting of rocks, plants, and animals increase with increasing visitor populations. Cactus collectors at Organ Pipe NM are severely impacting the natural species composition of the desert. In addition, collecting of ginseng at Fort Donnellson NMP is depleting the population. Coral reefs are threatened by both visitor and commercial collection of reef organisms at Fort Jefferson NM and Biscayne NM, and both are closely scrutinizing permits for research as a corrective measure for this threat. In general, unauthorized specimen collecting, or poorly supervised authorized collecting, can affect the general scene and the park experience, as well as adversely impacting rare geological features, endangered or threatened species, and rare or fragile communities

and habitats.

Increasing ranger patrols and initiation of public awareness programs to diminish the unauthorized collection of cultural and natural resources were most often reported as corrective actions taken by the parks.

Buffalo NR and Canyon de Chelly NM reported increasing patrols to reduce archeological collecting. Lake Meredith RA acted similarly to reduce specimen collecting. Public awareness programs were reported by Carlsbad Caverns NP, Chaco Canyon NM, Gila Cliff Dwellings NM, Hot Springs NP, and Cabrillo NM. Gran Quivira NM reported using both public awareness programs and increased patrols. Manassas NBP has drafted new regulations that allow for greater enforcement authority.

Grazing by non-native wildlife (exotic or domestic animals) poses a threat to park resources since it may significantly alter the natural vegetation, and the animals can compete with native wildlife for food. In addition, large populations of both native and non-native grazers, left unchecked, can damage the fragile communities that the parks were set aside to protect. Cape Lookout NS reported grazing by cattle, horses, goats, and sheep as a threat to the dunes, the wetland and grassland communities, and the terrestrial mammals. Lake Meredith RA employs fencing to control grazing, but would like to eliminate grazing. Redwood NP reported efforts to eliminate grazing by 1986.

Hunting is not permitted in parks unless authorized, but some parks reported problems with poaching of wildlife. Fort Larned NHS and Fossil Butte NM reported threats under this subcategory. Unauthorized hunting (poaching) can threaten populations of endangered species, terrestrial mammals, birds, amphibians and reptiles.

Fishing, on the other hand, both sport and commercial, is permitted in many of our parks, although usually regulated. Commercial fishing was often cited as a threat. Glen Canyon NRA reported their commercial fishing tournament as a threat to park resources, and Biscayne NM and Gulf Islands NS also reported commercial fishing as a threat. Overharvesting of fish was a threat reported by Yellowstone NP, Curecanti NRA, and Virgin Islands NP. Overharvesting of shellfish and other invertebrates was reported as a threat in the Virgin Islands. Methods of harvest also cause problems for related park resources; at Buffalo NR, harvesting of fish by dynamite and chemicals was cited as a threat.

Activities to diminish poaching of fish and wildlife include: increasing patrol and enforcement at the George Washington Memorial Parkway, Manassas NHS, and Redwoods NP, initiating public awareness programs at Cabrillo NM, and working with outside groups at Channel Islands NM and with local gun clubs at Antietam NM. George Washington Memorial Parkway reported posting of shoreline areas and marking of property lines to end illegal commercial fishing.

Fires, landslides and other catastrophes pose a potential threat to most park resources, either directly or indirectly. They are natural events, but park cultural resources, visitor and employee safety, and park and park operational facilities which are truly threatened. Some of the parks and the threats reported under this subcategory include: Everglades NP, threatened by hurricanes; Sequoia NP, threatened by avalanches; Curecanti NRA, threatened by potential landslides; Rocky Mountain NP and Big Cypress NP were concerned about lightning strikes and potential wildfire threats; and Antietam NB reported threats from flooding.

Corrective measures reported at Coulee Dam RA include control of potential landslides and revegetation of landslide areas. Redwood NP reported a revegetation program for landslides in addition to a total fire suppression program. Lava Beds NM listed a fire control program. Ebey's Landing NHR reported preventive measures in designing trails that would not aggravate slide conditions. Wildland fires are discussed from the non-suppression standpoint under the aesthetic degradation threat category.

Mineral extraction has far reaching effects on both cultural and natural park resources from both internal and external activities. Methods of mineral extraction are aesthetically degrading to a park; however, the impacts of the changes in habitat structure and of the developments that accompany the extraction process affect most park communities. Ozark NSR reported threats to aquatic invertebrate populations from lead and gravel operations. Carlsbad Caverns NP and Guadalupe Mountains NP are threatened by activities associated with sulfur and copper mining. The water quality in New River, South Fork is threatened by coal mining.

Gas and oil extraction pose threats to park resources similar to those discussed under mineral extraction due to activities associated with the extraction and refining processes. Carlsbad Caverns NP and Guadalupe Mountains NP reported natural gas extraction as a threat, while Assateague Island NS and other shoreline parks are concerned with oil spills and their effects on plant and animal communities therein.

Corrective measures for gas, oil, and mineral extraction threats in most cases were limited to working with outside groups and community organizations as reported by Lake Meredith RA and Ebey's Landing NHR. Death Valley NM reported that increasing patrols and checking mining permits would diminish the number of borate and talc mining sites.

Excesses and abuses of Native American religious gatherings can occur.

The American Indian Religious Freedom Act includes access to burial grounds, holding religious ceremonies on traditional grounds, and Indian use of traditional costumes. These activities have been reported as threats to endangered species and grassland plant communities at Badlands NP, and as threats to birds and mammals at Wind Cave NP. Redwood NP reported mitigation of threats by designating sites for Indians to gather. Actions by Hubbell Trading Post NHS promote preservation of archival material by recording all material temporarily removed from park collections for ceremonial purposes.

Logging was discussed previously under the aesthetic degradation threat category, and will also be addressed here. In addition to threatening the general scene and plant communities, logging has a pronounced effect on the animal communities associated with the logged site. Glacier NP reported threats to mammals from logging operations. Increased ranger patrols in some parks have diminished unauthorized logging or firewood collecting. Sleeping Bear Dunes NL reported activities to rehabilitate cut-over areas and Oregon Cave NM reported working with the U.S. Forest Service to minimize the impacts of logging. In addition, development of buffer areas was cited by Ebey's Landing NHR as a corrective measure.

Deterioration of structures by weathering and erosion of historic structures were reported as physical removal of resources in the other subcategory. Parks reporting efforts in structural rehabilitation include Jefferson NEM NHS, Aztec Ruins NM, Amistad NRA, Buffalo NR, and Big Bend NP. This category also includes animal trespassing reported by Hubbell Trading Post NHS where the corrective activity was installation of fences.

**Parks Reporting Monitoring/Research Activities and Corrective Activities
for the Physical Removal of Resources Threat Category**

SOIL EROSION					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
INDU	GWMP	AMIS	INDU	INDU	FOUN
CHCA	CHCA	BAND	HUTR	HUTR	HUTR
CATO	PRWI	BIBE	CATO	CATO	SAGN
PRWI	SACN	BUFF	GREE	GREE	MOCI
SACN	GERO	CACH	ANAC	NACC	WIHO
GRPO	ASIS	CACA	FOCI	ANAC	REDW
GERO	MOMC	CHCA	FRDO	FOCI	
FOLA	REDW	ELMO	MEHI	FOWA	
CUVA	GOGA	FOSH	SUIT	FRDO	
ASIS		GICL	PRWI	KEAQ	
MOMC		HUTR	JEFF	MEHI	
REDW		NAVA	SLBE	SUIT	
ORPI		WWSA	REDW	PRWI	
GOGA		WUPA	CABR	WOTR	
		INDU	GOGA	JEFF	
		GRPO	WHIS	FOLA	
		GERO		SLBE	
		REDW		REDW	
				CABR	
				GOGA	
				WHIS	
				PEFO	
TOTAL	14	9	18	16	6

ILLEGAL COLLECTING AT ARCHEOLOGICAL SITES					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
ORPI	CHIC	ALIB	ARPO	ARPO	ALIB
CHIC	HUTR	AMIS	CHCA	CHCA	ARPO
HUTR	REDW	BAND	CLBA	CHIC	AZRU
REDW	PRWO	BIBE	HUTR	HUTR	BAND
KLGO	KLGO	BUFF	PAIS	PAIS	BIBE
SITK	SITK	CHIC	HAPE	ANTI	BUFF
TONT	TONT	GICL	MANA	GWMP	CACH
		HOSP	CODA	CLBA	CACA
		HUTR	GRPO	HAPE	CHCA
		LAME	LIHO	GRPO	CHIC
		NAVA	KLGO	PIRO	ELMO
		PAIS	REDW	KLGO	GICL
		WUPA		REDW	GRQU
					HUTR
					LAME
					NAVA
					PAIS
					PAAL
					PECO
					WWSA
					WUPA
					REDW
					GRPO
TOTAL	7	7	13	12	23

LOGGING					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
CATO	NOCA	PIRO	INDU	INDU	REDW
MORA	GRPO	REDW	CODA	EBLA	
NOCA	EFMO		MORA	MORA	
APIS	PIRO		ORCA	REDW	
GRPO	REDW		SLBE	CRLA	
EFMO			REDW		
PIRO			CRLA		
REDW					
TOTAL	8	5	2	7	1

GAS AND OIL EXTRACTION					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
MOMC	MOMC	REDW	ALIB		ALIB
REDW	REDW	TUZI			LAMR
					CHIS
TOTAL	2	2	2	1	3

MINERAL EXTRACTION					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
PIRO	DEVA	TUZI	DEVA	DEVA	
MOMC	PIRO		INDU	INDU	
TONT	MOMC			EBLA	
	TONT				
	WHIS				
TOTAL	3	5	1	2	3

FIRE/LANDSLIDES/OTHER CATASTROPHES					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
WACA	WACA	ELMO	LABE	LABE	GRPO
CHOH	CHOH		CHOH	CHOH	WIHO
KLGO	KLGO		CODA	CODA	REDW
LECA	LECA		GRPO	EBLA	
			KLGO	GRPO	
			REDW	KLGO	
				REDW	
TOTAL	4	4	1	6	3

Physical Removal of Resources Threat Category (continued)

HUNTING/POACHING/OVERHARVESTING						
Monitoring/Research Activities			Corrective Activities			
Underway	Planned	Requires	Underway	Planned	Requires	
FY80	FY81	Funding	FY80	FY81	Funding	
MANA	MANA		ANTI	ANTI	REDW	
PRWI	GRPO		MANA	GMMP		
GRPO	SITK		PISC	MANA		
SITK	KLGO		REDW	PISC		
KLGO	LAVO		CABR	REDW		
LAVO	HALE		KATM	CABR		
HALE	HAVO			KATM		
HAVO	MOMC					
MOMC	GOGA					
KATM						
GOGA						
TOTAL	11	9	0	6	7	1

FISHING/POACHING/OVERHARVESTING						
Monitoring/Research Activities			Corrective Activities			
Underway	Planned	Requires	Underway	Planned	Requires	
FY80	FY81	Funding	FY80	FY81	Funding	
BUFF	OLYM	PORE	GMMP	GMMP	CHIS	
OLYM	SITK	PUHO	ROCR	ROCR	REDW	
SITK	KLGO		KATM	KATM		
KLGO	REDW		CABR	CABR		
KATM	GOGA					
REDW						
GOGA						
TOTAL	7	5	2	4	4	2

SPECIMEN COLLECTING						
Monitoring/Research Activities			Corrective Activities			
Underway	Planned	Requires	Underway	Planned	Requires	
FY80	FY81	Funding	FY80	FY81	Funding	
INDU	INDU		HOSP	HOSP	HOSP	
PRWI	PRWI		INDU	INDU	LAME	
ROCR	ROCR		ARHO	ARHO	PEFO	
			PRWI	PRWI		
			ROCR	ROCR		
			EFMO	EFMO		
			WAPA	WAPA		
			MOMC	MOMC		
			REDW	REDW		
			CABR	CABR		
			HAVO	ORPI		
TOTAL	3	3	0	11	11	3

EXCESSES AND ABUSES OF NATIVE AMERICAN RELIGIOUS GATHERING						
Monitoring/Research Activities			Corrective Activities			
Underway	Planned	Requires	Underway	Planned	Requires	
FY80	FY81	Funding	FY80	FY81	Funding	
			REDW	PECO	BAND	
			PECO	HUTR	HUTR	
				PISC	PECO	
				REDW	REDW	
TOTAL	0	0	0	2	4	4

GRAZING						
Monitoring/Research Activities			Corrective Activities			
Underway	Planned	Requires	Underway	Planned	Requires	
FY80	FY81	Funding	FY80	FY81	Funding	
REDW	REDW	CACH	CORO	CORO	ALIB	
LECA	PORE		ORCA	ORCA	CACH	
GOGA	LECA		KLGO	KLGO	LAMB	
GRCA	GOGA		LAVO	GOGA	REDW	
	GRCA		GOGA	CRLA		
			CRLA			
TOTAL	4	5	1	6	5	4

OTHER						
Monitoring/Research Activities			Corrective Activities			
Underway	Planned	Requires	Underway	Planned	Requires	
FY80	FY81	Funding	FY80	FY81	Funding	
		ARPO	AMIS	AMIS	AMIS	
		AZRU	AZRU	AZRU	ARPO	
		BAND	BAND	BAND	AZRU	
		FODA	BIBE	BIBE	BAND	
		FOUN	BUFF	BUFF	BIBE	
		HUTR	ELMO	ELMO	BUFF	
		LAME	FOSH	FOSH	ELMO	
		PERI	FOUN	FOUN	FOSH	
		SAAN	GRQU	GRQU	FOUN	
			HOSP	HOSP	GRQU	
			NAVA	HUTR	HOSP	
			PECO	NAVA	HUTR	
			WUPA	PECO	NAVA	
			GREE	WUPA	PAAL	
			CHOH	GREE	PECO	
			ROCR	CHOH	WUPA	
			CRMO	FRDO	SITK	
				ROCR	KLGO	
				JEFF	WHIS	
TOTAL	0	0	9	17	19	19

Exotic encroachment deals mainly with internal threats which are derived from outside the park. It is evident from Table 1 that almost equal numbers of parks engage in monitoring/research activities as do those engaging in corrective actions. Animals such as burros, feral pigs and dogs are a major influence in this threat category, with plants such as kudzu and tamarisk following closely. It is obvious from Attachment 15 that internal threats in this category are being treated more often than not, by active, physical removal. External threats, on the other hand, such as aircraft noise, industrial noise, and seismic blasting, are closely monitored. Corrective measures for these threats occur mostly through meetings with local State, and industrial officials. The parks can only serve to inform these officials of Service policy on these external threats and seek their cooperation, or rely on legal action if damage can be documented.

Exotic plant problems are present in many parks and occur in all stages of severity. Some, like the ice plant in Channel Islands NM and the Brazilian pepper trees in the Everglades NP, pose extreme management problems. Others such as the ubiquitous dandelion, are not so pressing.

Exotic plants can enter park areas in two ways. They can migrate, or they can be transported. Examples of immigration methods include airborne dispersal, creeping in through developed or disturbed corridors such as roadsides and river banks, and on or in the bodies of animal carriers. Examples of airborne exotics which have entered park areas include Chestnut blight and Dutch Elm disease. Man has introduced exotics through landscaping, both of settled homesteads before park establishment, and of

park maintained areas such as visitor centers, historic sites, and roadsides. Japanese honeysuckle and multiflora rose are decorative species that have entered park areas in this manner. Kudzu vine has been planted for erosion control.

Many resources are affected by exotic plant intrusion. Native vegetation may be crowded or excluded, animals occupying altered niches may compete with native populations, and the equilibria of whole communities can shift from pristine condition. Tamarisk is an example of a plant which is successfully competing for water in such parks as Big Bend NP, Death Valley NM, and White Sands NM. Visitor experiences may be affected by the lack of truly natural settings.

Though they enter the parks in many varied ways, most exotic plants can be reduced or eliminated by hand as reported by Fort Scott NHS and Organ Pipe Cactus NM. Volunteers, often college students, assist in the eradication process. Other parks report the use of approved pesticides for removal of tamarisk and kudzu.

Noise from motor vehicles is derived not only from automobiles, mobile homes, and motorcycles, but off-road vehicles, dirt bikes, snowmobiles, and motorized boats. Noise pollution from these sources annoys other park visitors, disrupts animal life cycles and can alter behavior.

Noise from motor vehicles such as dune buggies disturbs beach visitors at Cape Lookout NS and motor boats disrupt humpback whales at Glacier Bay NM. Urban parks, as in the National Capital Region, are plagued by traffic noises from fire truck, ambulance, and police sirens.

Many urban parks institute corrective measures by requesting rerouting of some traffic, such as buses at Ford's Theater NHS, or by planning "car pools

only" restrictions in a park, or by closing sections to all vehicular traffic, as at Rock Creek Park. Other parks such as Fort Scott NHS have engaged in "screen" plantings to partially alleviate the noise. Monitoring activities employ noise monitoring equipment, with Indiana Dunes NL being a prime example.

Noise from aircraft can be derived from commercial airlines, many of which route their flights over large expanses of natural landscape, including parks, to avoid metropolitan areas. Similarly, the military uses remote park areas for practicing air maneuvers. The noise impact along the barrier islands, such as Gulf Islands NS from sonic booms, prevent terns from nesting. The backcountry experience of campers is eroded by the drone of aircraft flying overhead. There is evidence that the Lincoln Memorial is being structurally weakened by air traffic, and low-flying helicopter tours at Mt. Rushmore NM are annoying to other park visitors.

Most parks deal with aircraft noise problems in the logical and available way, by requesting that commercial and military organizations reroute flights over other areas. Death Valley NM used this method, while Hawaii Volcanoes NP has taken this one step further by enlightening military fliers to the park's plight. Organ Pipe Cactus NM actually has been successful as the U.S. Air Force is cooperating by rerouting of some flights.

Random loud noises, such as sonic booms, are disruptive to wildlife and can prevent breeding by occurring at crucial times. Pipe Springs NM reports that seismic blasting shocks from adjacent raw materials companies are disrupting the life cycles of terrestrial amphibians and reptiles. Prince William Forest Park has problems with adjacent construction and military activities harming terrestrial mammals.

To combat these ear and earth shattering occurrences, again, many parks are requesting limitation of military overflights, such as Lehman Caves NM and Fort Davis NHS. Lincoln Boyhood NM receives pre-blast surveys of the structural conditions of its buildings from the organizations engaged in seismic blasting near the monument.

Noise from industry is a problem in many cultural parks adjacent to metropolitan and industrial areas. Richmond NB is plagued by a nearby aircraft industry that detracts from both visitor experience and cultural resource landscapes. Chattahoochee River NRA, Indiana Dunes NL, and Kennesaw Mountain NBP also are affected by industrial noise.

Major mitigation activities in this category involve maintenance of communications with the offending industries. Often these parks, such as Fort Smith NHS, and Jean Lafitte NHP work on legislation to control noise from surrounding industries.

Noise from visitors is a problem affecting the "park experience" of other visitors. It can also directly impact park resources. For example, bighorn sheep in Death Valley NM and Lake Mead NRA are extremely shy and the noise of visitors, coupled with odors, may exclude these animals from prime feeding grounds. No parks reported efforts to curtail visitor noise at the present time.

Exotic animal problems are some of the most published of the issues facing the Service today. Burros at Grand Canyon NP, hogs in Great Smoky Mountains NP, goats at Hawaii Volcanoes NP, rats in Lafayette Square, and all four species at Channel Islands NM, are just the tip of an iceberg. Pine bark beetles, balsam wooly aphids, fire ants, brown trout, rainbow trout, and suckers; exotic animals threaten the natural resource integrity of

of parks across the country. In Haleakala NP, feral hogs destroy native vegetation cover and make conditions favorable for the invasion of non-native plant species. In Cumberland Islands NS, feral hogs disturb nesting of endangered sea turtles. Burros in Bandelier NP compete for water resources with the native wildlife. Unless controlled, balsam wooly aphids may eradicate an entire vegetation type in the Great Smoky Mountains NP. Most exotic animal populations are being monitored. Corrective activities deal mostly with removal of the exotics from the park. The JFK Center for the Performing Arts reports problems with rats, and combats the problem by training employees in proper trapping procedures. Death Valley NM and Grand Canyon NP must deal with larger animals, namely burros, and both are currently engaged in well-publicized burro removal projects in conjunction with various outside groups.

Fire is a natural and necessary perturbation for many ecosystems, but unnatural timing, intensity, or placement of fire can cause severe and persistent damage to park resources.

Unnatural fires often are a result of arson or vandalism. Examples of damage include loss of tropical hardwood hammocks in Everglades NP, loss of buildings and cultural resource sites in Knife River Indian Villages NHS, and threats to visitor and employee safety in Santa Monica Mountains NRA. Fires are discussed in other contexts in the categories of physical removal of resources and aesthetic degradation.

Employee training in fire fighting is practiced by many parks. In addition to increasing employee training, some parks, such as Arlington House, the Robert E. Lee Memorial, are updating alarm systems and/or engaging in public education programs on fire safety. Other parks, such

as Theodore Roosevelt Island attempt to decrease the probability of arson by closing at dark.

In the other subcategory, we include illegal Latin American aliens, a problem at Organ Pipe Cactus NM, because offenders use the park to enter the United States. The park is installing electronic surveillance systems.

Parks Reporting the Status of Monitoring/Research and Corrective Activities by Subcategory for the Exotic Encroachment Category.

ANIMALS					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
THRI	NACC	AZRU	CATO	CATO	CACA
NACC	WHHO	BAND	GREE	GREE	REDW
FOTH	PISC	CACA	GWMP	GWMP	HAVO
WHHO	MORA	CHCA	FOTH	THRI	
PISC	OLYM	ELMO	FOWA	JOFK	
NAVI	ISRO	GRQU	KEAQ	FOTH	
MORA		NAVA	PISC	FOCI	
OLYM	HALE	PECO	PRWI	FOWA	
ISRO	PORE	WHPA	ROCR	KEAQ	
ASIS	CHIS	WUPA	WOTR	OXCO	
HAVO	KLGO	VOYA	PIPE	PISC	
HALE	REDW		KLGO	PRWI	
PORZ	ORPI		DEVA	ROCR	
CHIS	GOGA		HAVO	PIPE	
KIGO	INDU		CHIS	KLGO	
REDW			LAHE	DEVA	
GOGA			GRCA	HAVO	
BITH				CHIS	
				GRCA	
TOTAL	18	15	11	17	19

PLANTS					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
PRWI	ARHO	AZRU	JELA	GWMP	HOSP
NOCA	THRI	GRQU	SAAN	FOCI	SAAN
HOME	ROCR	PECO	FOCI	FOWA	HAVO
HAVO	NOCA	REDW	FOWA	PRWI	
SEKI	OLYM	PORE	ROCR	ROCR	
WAPA	HAVO		MORA	MORA	
ORPI	SEKI		ORCA	ORCA	
PEFO	WAPA		MOCI	MOCI	
	LECA		FOSC	FOSC	
			SLBE	REDW	
			REDW	ORPI	
			HAVO	HAVO	
			CRLA	CRLA	
			PEFO	PEFO	
			INDU	INDU	
			GWMP		
TOTAL	8	9	5	16	15

OTHER					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
				WHMI	
				ORPI	
TOTAL	0	0	0	2	0

Exotic Encroachment Category (continued)

NOISE--MOTOR VEHICLES					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
MOTR	MOTR		WHHO	GRPO	HAFE
FOSC	FOSC		GRPO	FOSC	GRPO
INDU	INDU		FOSC	WAPA	HAVO
			LIHO	INDU	
			WAPA		
			JOHU		
			INDU		
TOTAL	3	3	0	7	4
					3

NOISE--AIRCRAFT					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
HAFE	ARHO	CHCA	ORPI	CRHO	HAVO
PRWI	THRI	GICL	HAVO	DEVA	
GRPO	HAFE		GRCA	GRCA	
CABR	PRWI				
CRLA	GRPO				
INDU	CABR				
	CRLA				
	INDU				
TOTAL	6	8	2	3	3
					1

UNNATURAL FIRES (HUMAN CAUSED)					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
PRWI	CACA	ALIB	HUTR	CHIC	ALIB
WOTR	MOTR		ARHO	HUTR	CHIC
SEKI	SEKI		THRI	ARHO	HOSP
MOMC	MOMC		PRWI	THRI	HUTR
DENA	DENA		GRPO	ROCR	GRPO
			FOLA	GRPO	WIHO
			JOHU	FOLA	JOHU
			HAVO	JOHU	HAVO
			GWMP	HAVO	
			CLBA	GWMP	
				CLBA	
TOTAL	5	5	1	10	8
				1b	

SEISMIC BLASTING, SHOCKS, SONIC BOOMS					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
CHCA	CHCA	BAND	LIBO	LIBO	FODA
LECA	LECA	CHCA			TUMA
		ELMO			
		GRQU			
		WJPA			
		TUMA			
TOTAL	2	2	6	1	1
					2

NOISE--INDUSTRIAL					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
INDU	INDU	REDW	JOHU		POSH
					JELA
TOTAL	1	1	1	0	2

NOISE--VISITOR					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
			PRWI	PRWI	
TOTAL	0	0	0	1	0

There are certain threats that can be traced to man, the visitor. While most of the other categories were some combination of both internal and external threats, visitor impacts are almost exclusively internal.

Table 1 shows that the number of mitigating activities reported for the visitor physical impacts threat category falls in the middle range relative to all categories. Since impacts are from internal sources and people can be regulated, visitor impacts can be mitigated.

As shown in Attachment 16, the most reported problems were erosion and trampling. Most parks visually monitor conditions using rangers as observers. Indiana Dunes NL, Cape Cod NS and Assateague Island NS reported erosion of beaches and dunes from visitors and their vehicles. Trampling was reported by Aztec Ruins NM where visitors climb on ruin walls. Corrective activities vary and include: closing camping areas or rerouting trails at Grand Portage NM, Greenbelt Park, Alibates Flint Quarries NM, and Catoclin Mountain Park; increasing protection by patrolling at Cabrillo NM and Aztec Ruins NM; and upgrading of eroded landscapes at Crater Lake NP and Catoclin Mountain Park. Jefferson NEM NHS used barriers to exclude visitors as a solution to erosion and trampling problems. Buffalo NR reported threats from stream erosion, and efforts to monitor the affected areas.

Habitat destruction endangers park ecosystems and cultural and historical resources. Sequoia and Kings Canyon NP reported suppression of natural fire as the source of habitat destruction, and are monitoring the effects of fire suppression. The other parks reporting attributed habitat destruction mainly to human sources, and most often their motorized vehicles (off-road

vehicles and automobiles) as reported by Rock Creek Park, Assateague Island NS, and Indiana Dunes NL. Indiana Dunes NL also reported habitat destruction from mining and timber removal and is monitoring these activities. Corrective actions include decreasing the number of visitors and vehicles allowed in certain areas of the parks, both daily and seasonally. Voyageurs NP is attempting to work with county zoning boards and Yosemite NP has transplanted trees into denuded areas of campgrounds to repair damaged habitat.

As evidenced by bear incidents in several parks, wildlife harassment can be hazardous to visitor safety. The feeding of wildlife is the most common harassment, however vehicles and visitor pets have also been reported by parks, such as Rock Creek Park, to harass wildlife. Organ Pipe Cactus NM reported problems from camping near water holes, as leading to undue exclusion of wildlife from limited water sources. Hawaii Volcanoes NP excludes pets to prevent wildlife harassment. Organ Pipe Cactus NM is conducting studies which seek to understand the importance of mine shafts as bat habitat and the efficacy of partial shaft closures to diminish bat population harassment. Catoclin Mountain Park has banned public snowmobiling in an effort to reduce potential wildlife harassment. All parks monitor these problems and corrective measures must include visitor education.

Off-road vehicle use, monitored in many parks, contributes not only to erosion, but also to destruction of plant communities and wildlife harassment. Major corrective actions involve increasing patrols, as at Sleeping Bear Dunes NL, or informing visitors of park policies relating to vehicular use. Barriers have been constructed in some parks at entry points to traditional ORV use areas such as at Hawaii Volcanoes NP, Effigy Mounds NM, Walnut Canyon NM and Indiana Dunes NL.

Most parks correct problems relating to campfires by establishing specified fire rings at campsites, and by increasing ranger patrols. Indiana Dunes NL eliminated campfires from beaches and is rehabilitating scarred areas. Cross-country skiing has been implicated in trampling of vegetation and is monitored at Effigy Mounds NM.

Subtle influences include algal growth, especially in caves, where it threatens cave systems at Lava Beds NM, Oregon Caves NM and Carlsbad Caverns NP. Algal growth problems at Oregon Caves NM were corrected by limiting the number of visitors viewing the caves, decreasing the light cycle, and killing the algae and moss by spraying with chlorine bleach. Lint deposition on cave formations was a problem reported by Lehman Caves NM and formations are sprayed with water to remove the lint.

Other visitor impacts reported were poor sanitation practices at Bandelier NP. Overcrowding was reported to impact cultural resource structures at Lincoln Home NHS, where monitoring is ongoing. Lyndon B. Johnson NHS reported oak tree decline and the oaks are treated whenever possible. Lincoln Memorial Park and San Antonio Missions NHP reported problems with domestic dogs and tried to alleviate the problem by enforcing mandatory leashing and supervision of pets. War in the Pacific NHP reported a litter problem and is engaged in clean up activities.

Parks Reporting the Status of Monitoring/Research and Corrective Activities by Subcategory for the Visitor Physical Impacts Category.

TRAMPLING						
Status						
Monitoring/Research Activities			Corrective Activities			
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding	
BUFF	THRI	BAND	ALIB	ALIB	ALIB	
HAFE	HAFE	BIBE	CATO	HOSP	AZRU	
WHHO	WIBO	BUFF	GREE	HUTR	BAND	
WOTR	OLYM	CHCA	GWMP	CATO	BIBE	
OLYM	WHMI	GICL	HAFE	GREE	BUFF	
WHMI	PIRO	HUTR	NACC	GWMP	CACH	
APIS	SEKI	NAVO	ANAC	THRI	ELMO	
PIRO	GRCA	WUPA	FOCI	NACC	GRQU	
SEKI	GOGA	REDW	FRDO	ANAC	PECO	
LAVO	INDU		LIPK	FOCI		
GOGA	REDW		MEHI	FRDO		
INDU			PRWI	KEAQ		
REDW			ROCR	LIPK		
			NOCA	PRWI		
			APIS	ROCR		
			JEFF	EBLA		
			GRPO	NOCA		
			CABR	JEFF		
			JOTR	CABR		
			CRLA	CRLA		
			INDU	INDU		
TOTAL	13	11	9	21	21	9

EROSION						
Status						
Monitoring/Research Activities			Corrective Activities			
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding	
BUFF	THRI	CACH	CATO	CATO	SIKA	
OLYM	OLYM	SIKA	CHOH	CHOH	GRPO	
PIRO	PIRO	REDW	GWMP	GWMP		
SAGU	SAGU		CLBA	ARHO		
MOHC	SEKI		THRI	CLBA		
SIKA	GRCA		HAFE	NACC		
GOGA	MOHC		NACC	ANAC		
REDW	SIKA		ANAC	FOCI		
SEKI	GOGA		FOCI	FOWA		
	REDW		FOWA	FRDO		
			FRDO	PRWI		
			MEHI	ROCR		
			PRWI	EBLA		
			ROCR	GRPO		
			JEFF	ISRO		
			GRPO	SLBE		
			SLBE	KLGO		
			KLGO	CABR		
			CABR	LECA		
			LECA	GOGA		
			GOGA	CRLA		
			CRLA			
TOTAL	9	11	3	22	21	2

ORV's						
Status						
Monitoring/Research Activities			Corrective Activities			
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding	
WOTR	SLBE	WUPA	PRWI	CODA	CACA	
SLBE	CACO		GRPO	GRPO	CHCA	
CACO	ASIS		EFMO	EFMO	LAME	
ASIS	INDU		KLGO	KLGO	GRPO	
			HAVO	HAVO	HAVO	
			WACA		INDU	
			INDU			
TOTAL	4	4	1	7	5	6

CROSS COUNTRY SKIING						
Status						
Monitoring/Research Activities			Corrective Activities			
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding	
EFMO	EFMO					
TOTAL	1	1	0	0	0	0

Visitor Physical Impacts Category (continued)

HABITAT DESTRUCTION					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
WOTR	GWMP	CACA	LIPK	FCCI	INDU
SEKI	SEKI	REDW	PRWI	LIPK	
BUFF	GRCA		ROCR	PRWI	
REDW	INDU		MORA	RCCR	
	REDW		VOYA	EBLA	
			DEWA	MORA	
			YOSE	VOYA	
			JOTR	ISRO	
			INDU	YOSE	
				INDU	
TOTAL	4	5	2	7	10

WILDLIFE HARASSMENT					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
SLBE	SLBE	YOSE	CATO	CATO	KATH
SEKI	SEKI	KATH	PRWI	PRWI	ORPI
BUFF	GRCA	REDW	ROCR	KATH	HAVO
KATH	ORPI		ISRO	CRLA	
ORPI	GOGA		KATH	HAVO	
GOGA	CRLA		CRLA		
CRLA	REDW		HAVO		
REDW					
TOTAL	3	7	3	7	3

SUBTLE INFLUENCES					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
BUFF	ARHO	BAND	JOFK	GWMP	BAND
GWMP	WHHO	CHCA	LECA	JOFK	CACA
WHHO	OZAR	REDW		LECA	ELMO
OZAR	LECA				GICL
LABE	CRLA				HAVO
CRLA	REDW				WAPA
REDW					LECA
TOTAL	7	5	3	2	7

CAMPFIRE					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
CRLA	CRLA	ALIB	GWMP	GWMP	ALIB
OLYM	OLYM	SAND	GRPO	EBLA	GRPO
INDU			ISRO	GRPO	
			KLGO	ISRO	
			CRLA	KLGO	
			INDU	CRLA	
				INDU	
TOTAL	3	2	2	6	7

OTHER					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
LITHO		ALIB	CHIC	CHIC	AMIS
		AMIS	FOSH	FOSH	BAND
			LYJO	LYJO	CHIC
			LIPK	LIPK	FOSH
			WAPA	CRMO	LYJO
			JOMU	WAPA	SAAN
					CRMO
TOTAL	1	0	2	6	7

CC

Park operational procedures are essential for proper functioning and maintenance of our parks. A slightly greater number of parks are performing corrective activities than are performing monitoring/research activities (Table 1). No single threat was reported consistently but the most obvious corrective action is training of employees to reduce employee unawareness (Attachment 17).

Improper placement of roads can create unsightly vista scars, flooding, excessive soil erosion, and slope collapse. Placement of roads at Natural Bridges NM has marred the general scene. In Canyonlands NP, wetland plant communities and soils have been harmed by increased runoff. Utility corridors from the electric generating station at Glen Canyon NRA are surprising sights to visitors expecting natural scenery. George Washington Memorial Parkway reported efforts to identify alternatives to salting park roadways, a practice threatening adjacent plant and animal communities. Organ Pipe Cactus NM reported closing of seriously eroded roads. Underground placement of new telephone lines at Petrified Forest NP was reported as an action to improve aesthetics.

Deteriorating facilities threaten park resources and pose a safety hazard to visitors and employees, as was reported by Bryce Canyon NP. The recent repair work at JFK Center for the Performing Arts was completed to minimize vibration and subsequent structural damage. Yosemite NP improved facilities by both the removal of obsolete and obtrusive structures and the installation of bear-proof storage lockers.

Even though the policy of regarding suppression of natural fires is changing in Federal land managing agencies with increased understanding of the role of natural fire, public and private attitudes toward fire, created by "Smokey the Bear" campaigns, will take time to change. The Fire Prevention Management policy in the Service had caused a number of dilemmas. Fire suppression in ecosystems where fire was important historically, has allowed heavy accumulation of fuel as in parts of Badlands NP. A fire at Badlands NP today would be unnaturally large and hot and could damage the native vegetation and wildlife adapted to frequent but cool fires. In some areas, a history of fire suppression has resulted in a vegetation change from fire-maintained to later seral stages. Further, with the introduction of so many exotic plants in parks, burning may not stimulate return to an earlier vegetational stage, but rather, as in areas of the Everglades NP, simply prepare the land for invasion by new species. Carlsbad Caverns NP, Indiana Dunes NL, and many other parks in historical fire areas, must alter past management practices; Indiana Dunes NL reported initiation of prescribed burning. Both development and implementation of Fire Management Plans were reported by Voyageurs NP and North Cascades NP.

Mismanagement and misplacement of trails can cause problems. Trails placed incorrectly on slopes, in wetlands, or in alpine areas (e.g. Rocky Mountain NP) can damage fragile ecosystems. Negligence in maintaining the Appalachian Trail in the Great Smoky Mountains NP has hastened eroding the soil down to bedrock creating large bare swaths around temporary mudholes. In some instances, deeply eroded trail beds have captured streams and diverted flow down the trail. Mitigating activities include rerouting of trails and vegetative landscaping, as reported by Big Bend NP, Yosemite NP and Golden Gate NRA. Trail construction often destroys archeological sites, but

Buffalo NR reported using both pre-construction trail surveys, and rerouting of trails discovered on buried sites, to protect cultural resources.

Employee ignorance has been responsible for some damage to park resources as reported at Big Thicket NP and Badlands NP. An interpreter can misinform the visiting public and an uninformed public or uninformed maintenance workers can damage cultural and natural resources. Clara Barton NHS reported continuing training in the care of historical objects. Jefferson NEM NHS reported attempts to correct the problem by increasing employee briefings.

Some park areas view research by universities and other institutions of higher learning as a threat to resources, especially if review of research proposals and supervision of in-park activities are not given proper attention. Parks that mention research as a problem include Knife River Indian Villages NHS and Florrisant Fossil Beds NM. Research activities can be damaging where there is excessive collecting of artifacts and samples, or when the research interferes with visitor experiences. Carlsbad Caverns NP and Chaco Canyon NM both reported threats to cultural resources from research and urged continuation of judicious review, by Service professionals, of any proposed or ongoing archeological research.

Misuse of biocides, which includes herbicides, pesticides, and fungicides, both inside and outside park boundaries, has harmed some parks. Misuse of the poison Rotenone extirpated a species of fish in the Great Smoky Mountains NP. At Fort Laramie NHS, animal populations within the park are affected by adjacent spraying for grasshopper control, and the persistent use of DDT in Mexico can affect animal populations north of the border, including those residing in our border parks. Golden Gate NRA improved

biocide use by training personnel in application and safety procedures. Development of alternative practices or program modification, where feasible, were reported by Indiana Dunes NL and Theodore Roosevelt Island.

Political pressures can result when there are conflicts between the park values and land uses outside the park boundary. As previously discussed, park lands can be subject to a wide range of impacts from the activities of adjacent neighbors: degradation of resources, air and water quality, diversion of surface water and groundwater drawdown, impacts on wildlife, visual blights, etc. Also, communities may want to use Federal lands as convenient sites for community facilities such as sewage treatment plants, power line rights-of-way, or landfills. Because neighbors of Federal lands often have different land use objectives and expectations, conflicts can be formidable. Service actions to protect and preserve the irreplaceable park resources of national significance often must be forged in the crucible of the political process as attempts are made to determine the appropriate relationship between park lands and lands of neighbors. Political pressures can be brought to bear by various interest groups, e.g., state/local government or private interests, all seeking to prevail with their particular objectives or expectations.

The other subcategory includes such things as conflicting park policies in Grand Teton NP, where concessioners located operations in a unique geological feature. Visitor ignorance was cited as a threat at Fort Washington Park, National Visitor Center, Joshua Tree NM and Grand Canyon NP. Each of these parks reported beginning public awareness programs. Access for the handicapped was cited as a problem at Gran Quivira NM and concession operations were cited at Lake Mead NRA. Problems with management of park collections were listed at Hot Springs NP, Buffalo NR, Bandelier NP and Padre Island NS.

Parks Reporting the Status of Monitoring/Research and Corrective Activities by Subcategory for the Park Operations Category.

ROADS & UTILITY CORRIDORS					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
CACA	CACA	CACA	GWMP	CATO	ELMO
CATO	GWMP	CHCA	KEAQ	KEAQ	WIHO
PISC	PISC	ELMO	PRWI	PISC	REDW
GRPO	GRPO	LYJO	ROCR	PRWI	
WICR	REDW	GRPO	WAPA	ROCR	
REDW		REDW	HAVO	WAPA	
			REDW	REDW	
			YOSE	PEFO	
			ORPI		
			PEFO		
TOTAL	6	5	6	10	8

EMPLOYEE IGNORANCE					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
	WUPA	BAND	FOSH	FOSH	AMIS
		FOSH	GWMP	GWMP	CACA
		NAVA	CLBA	JOFK	ELNO
		WUPA	JOFK	PRWI	GILA
			ROCR	ROCR	LYJO
			OLYM	OLYM	SAAN
			JEFF	GRPO	GRPO
			GRPO	KLGO	IALE
			KLGO	DEVA	
			DEVA	JOTR	
			PEFO	PUHO	
			GRCA	WHIS	
				HAVO	
				HALE	
				GRCA	
TOTAL	0	1	4	12	8

FACILITIES					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
BAND	CACA	AMIS	TUMA	TUMA	BUFF
CACA	NACC	BAND	HUTR	HUTR	FOSH
CHIC	SUIT	BUFF	JOFK	CATO	HUTR
CLBA	PRWI	CACA	OXCO	CLBA	GRPO
NACC		CHCA	SUIT	WHHO	
SUIT		HOSP	ROCR	OXCO	
PRWI		LYJO	WAPA	PISC	
WOTR			YOSE	SUIT	
				WAPA	
				YOSE	
TOTAL	8	4	7	8	4

SUPPRESSION OF NATURAL FIRES					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
NOCA	OLYM	BAND	ROCR	ROCR	BAND
OLYM	YOSE	GICL		NOCA	CACA
VOYA	CHIR	HAVO		VOYA	CHCA
YOSE	INDU			INDU	GICL
CHIR	WACA				INDU
LECA					
WACA					
TOTAL	7	5	3	1	4

Park Operations Category (continued)

TRAILS					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
BUFF	CACA	CACA	BUFF	BUFF	BIBE
CACA	GOGA	CHCA	CATO	CATO	
NOCA		LYJO	FOCI	FOCI	
GOGA			PRWI	PRWI	
			ROCR	APIS	
			HICME	ORPI	
			GOGA	YOSE	
				GOGA	
TOTAL	4	2	3	7	8

MISUSE OF BIOCIDES					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
THRI	NACC		GOGA	THRI	
NACC	UPDE		INDU	GOGA	
UPDE	INDU			INDU	
INDU					
TOTAL	4	3	0	2	3

RESEARCH					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
FOSH	SACN	AMIS	CACA	CACA	CACA
SACN		CHIC	CHCA	CHCA	AMIS
OZAR		GICL		APIS	
		HOSP			
		HUTR			
TOTAL	3	1	5	2	2

OTHER					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
JELA	GRQU	AZRU	BUFF	BUFF	ALIB
SAAN	HOSP	BAND	CACA	HUTR	ARPO
HAHA	JELA	BIBE	CHIC	FOWA	AZRU
PRWI	SAAN	BUFF	HUTR	HAHA	BUFF
	OXCO	CACA	FOWA	OXCO	CACA
	ORPI	CHCA	JOTR	NAVI	CHCA
		GRQU	GRCA	PRWI	HOSP
		JELA	JEFF	GRCA	HUTR
		PAIS			LANE
		PECO			PAIS
		YOSE			PERI
		KATH			PECO
		LAME			SAAN
					FOWA
					HAHA
					APIS
					KATH
TOTAL	4	6	13	8	17

POLITICAL PRESSURES					
Status					
Monitoring/Research Activities			Corrective Activities		
Underway FY80	Planned FY81	Requires Funding	Underway FY80	Planned FY81	Requires Funding
			LYJO	SAAN	PAAL
			SAAN	EBLA	GRPO
			GRPO	GRPO	
			SLBE		
TOTAL	0	0	0	4	2

<u>PARK</u>	<u>CODE</u>	<u>PARK</u>	<u>CODE</u>
Abraham Lincoln Birthplace NHS	ABLI	Capitol Reef NP	CARE
Acadia NP	ACAD	Capulin Mountain NM	CAMO
Adams NHS	ADAM	Carl Sandburg Home NHS	CASS
Agate Fossil Beds NM	AGFO	Carlsbad Caverns NP	CACA
Alibates Flint Quarries NM	ALFL	Casa Grande NM	CAGR
Allegheny Portage Railroads NHS	ALPO	Castillo de San Marcos NM	CASA
American MP	AMER	Castle Clinton NM	CACL
Amistad RA	AMIS	Catoctin Mountain Park	CATO
Anacostia Park	ANAC	Cedar Breaks NM	CEBR
Andersonville NHS	ANDE	Chaco Canyon NM	CHCA
Andrew Johnson NHS	ANJO	Chamizal NM	CHAM
Aniakchak NM	ANIA	Channel Islands NM	CHIS
Antietam NB	ANTI	Chattahoochee River NRA	CHAT
Antietam NC	ANTE	Chesapeake & Ohio NHP	CHOH
Apostle Islands NL	APIS	Chickamauga & Chattanooga NMP	CHCH
Appotomax Court House NHP	APCO	Chickasaw NRA	CHIC
Arches NP	ARCH	Chiricahua NM	CHIR
Arkansas Post NM	ARPO	Christiansted NHS	CHRI
Arl. House, The Robert E. Lee M	ARHO	Clara Barton NHS	CLBA
Assateague Island NS	ASIS	Colonial NHS	COLO
Aztec Ruins NM	AZRU	Colorado NM	COLM
Badlands NP	BADL	Congaree Swamp NM	COSW
Baltimore-Washington Parkway	BAWA	Coronado NM	CORO
Bandelier NM	BAND	Coulee Dam RA	CODA
Benjamin Franklin NM	BFNM	Cowpens NB	COWP
Bent's Old Fort NHS	BEOL	Crater Lake NP	CRLA
Bering Land Bridge NM	BELA	Craters of the Moon NM	CRMO
Big Bend NP	BIBE	Crow Creek Village Arch. Site	CRCR
Big Hole NB	BIHO	Cumberland Gap NHP	CUGA
Big South Fork NR & RA	BISO	Cumberland Island NS	CUIS
Big Thicket NP	BITH	Curecanti RA	CURE
Bighorn Canyon NRA	BICA	Custer Battlefield NM	CUST
Biscayne NM	BISC	Cuyahoga Valley NM	CUVA
Black Canyon of the Gunnison NM	BLCA	De Soto NM	DESO
Blue Ridge Parkway	BLRI	Death Valley NM	DEVA
Booker T. Washington NM	BOWA	Delaware Water Gap NRA	DEWA
Boston NHP	BOST	Denali NM	DENA
Brices Cross Roads NBS	BRCR	Devils Postpile NM	DEPO
Bryce Canyon NP	BRCA	Dinosaur NM	DINO
Buffalo NR	BUFF	Ebey's Landing NHR	EBLA
Cabrillo NM	CABR	Edison NHS	EDIS
Canaveral NS	CANA	Effigy Mounds NM	EFMO
Canyon De Chelly NM	CACH	Eisenhower NHS	EISN
Canyonlands NP	CANY	El Morro NM	ELMO
Cape Cod NS	CACO	Everglades NP	EVER
Cape Hatteras NS	CAHA	Federal Hall NM	FEHA
Cape Krusenstern NM	CAKR	Fire Island NS	FIIS
Cape Lookout NS	CALO	Florissant Fossil Beds NM	FLFO

ORGANIZATIONAL CODES (continued)

<u>PARK</u>	<u>CODE</u>	<u>PARK</u>	<u>CODE</u>
Ford's Theatre NHS	FOTH	Grand Portage NM	GRPO
Fort Bowie NHS	FOBO	Grand Teton NP	GRTE
Fort Caroline NM	FOCA	Grant-Kohrs Ranch NHS	GRKO
Fort Circle	FOCI	Great Sand Dunes NM	GRSA
Fort Clatsop NM	FOCL	Great Smoky Mountains NP	GRSM
Fort Davis NHS	FODA	Greenbelt Park	GREE
Fort Donelson NC	FODO	Guadalupe Mountains NP	GUMO
Fort Donelson NMP	FODN	Guilford Courthouse NHP	GUCO
Fort Frederica NM	FOFR	Gulf Islands NS	GUIS
Fort Jefferson NM	FOJE	Haleakala NP	HALE
Fort Laramie NHS	FOLA	Hamilton Grange NM	HAGR
Fort Larned NHS	FOLS	Hampton NHS	HAMP
Fort Matanzas NM	FOMA	Harmony Hall	HAHA
Fort McHenry NM & HS	FOMC	Harpers Ferry NHP	HAFE
Fort Necessity NB	FONE	Hawaii Volcanoes NP	HAVO
Fort Point NHS	FOPO	Herbert Hoover NHS	HEHO
Fort Pulaski NM	FOPU	Honokam Pima NM	HOPI
Fort Raleigh NHS	FORA	Home of Franklin D. Roosevelt NHS	HOFR
Fort Scott NHS	FOSC	Homestead NM of America	HOME
Fort Smith NHS	FOSM	Hopewell Village NHS	HOVI
Fort Stanwix NM	FOST	Horseshoe Bend NMP	HOBE
Fort Sumter NM	FOSU	Hot Springs NP	HOSP
Fort Union NM	FOUN	Hovenweep NM	HOVE
Fort Union Trading Post NHS	FOUS	Hubbell Trading Post NHS	HUTR
Fort Vancouver NHS	FOVA	Ice Age NSR	ICAG
Fort Washington Park	FOWA	Independence NHP	INDE
Fossil Butte NM	FOBU	Indiana Dunes NL	INDU
Frederick Douglass Home	FRDO	International Peace Garden	INPE
Fredericksburg & Spotsylvania BMP	FRSP	Isle Royale NP	ISRO
Fredericksburg NC	FRNC	Jamestown NHS	JAME
Gates of the Arctic NM	GAAR	Jean Lafitte NHP & R	JELA
Gateway NRA	GATE	Jefferson Memorial	JEMO
General Grant NM	GEGR	Jefferson NEM NHS	JEFF
George Rogers Clark NHP	GERO	Jewel Cave NM	JECA
George Washington Birthplace NM	GEWA	John D. Rockefeller, Jr. MP	JODR
George Washington Carver NM	GWCA	John Day Fossil Beds NM	JODA
George Washington NP	GWMP	JFK Ctr. for the Perf. Arts	JOFK
Gettysburg NC	GENC	John F. Kennedy NHS	JOFI
Gettysburg NMP	GETT	John Muir NHS	JOMU
Gila Cliff Dwellings NM	GICL	Johnstown Flood NM	JOFL
Glacier Bay NM	GLBA	Joshua Tree NM	JOTR
Glacier NP	GLAC	Katmai NM	KATM
Glen Canyon NRA	GLCA	Kenai Fjords NM	KEFJ
Gloria Dei Church NHS	GLDE	Kenilworth Aquatic Gardens	KEAQ
Golden Gate NRA	GOGA	Kennesaw Mountain NBP	KEMO
Golden Spike NHS	GOSP	Kings Canyon NP	KICA
Gran Quivira NM	GROU	Kings Mountain NMP	KIMO
Grand Canyon NP	GRCA	Klondike Gold Rush NHP	KLGO

ORGANIZATIONAL CODES (continued)

<u>PARK</u>	<u>CODE</u>	<u>PARK</u>	<u>CODE</u>
Knife River Indian Villages NHS	KNRI	Olympic NP	OLYM
Kobuk Valley NM	KOVA	Oregon Caves NM	ORCA
Lake Chelan NRA	LACH	Oregon NHT	OREG
Lake Clark NM	LACL	Organ Pipe Cactus NM	ORPI
Lake Mead NRA	LAME	Oxon Cove	OXCO
Lake Meredith RA	LAMR	Ozark NSR	OZAR
Lassen Volcanic NP	LAVO	Padre Island NS	PAIS
Lava Beds NM	LABE	Palo Alto Battlefield NHS	PAAL
Lehman Caves NM	LECA	Pea Ridge NMP	PERI
Lewis & Clark NHT	LECL	Pecos NM	PECO
Lincoln Boyhood NM	LIBO	Pennsylvania Ave. NHS	PEAV
Lincoln Home NHS	LIHO	Perry's Victory & Internatl. Peace Memorial	PEVI
Lincoln Memorial	LIME	Petersburg NB	PETE
Lincoln Park	LINC	Petrified Forest NP	PEFO
Longfellow NHS	LONG	Pictured Rocks NL	PIRO
Lowell NHP	LOWE	Pinelands NR	PINE
Lower Saint Croix River	LOSA	Pinnacles NM	PINN
Lyndon B. Johnson NHS	LYJO	Pipe Springs NM	PISP
Maggie L. Walker NHS	MALW	Pipestone NM	PIPE
Mammoth Cave NP	MACA	Piscataway Park	PIPA
Manassas NBP	MANA	Point Reyes NS	PORE
Martin Van Buren NHS	MAVA	Poplar Grove NC	POGR
McLoughlin House NHS	MCHO	Prince William Forest Park	PRWI
Meridian Hill	MEHI	Puuhonua O Honaunau NHP	PUHO
Mesa Verde NP	MEVE	Puukohola Heiau NHS	PUHE
Minute Man NHP	MIMA	Rainbow Bridge NM	RABR
Monocacy NB	MONO	Redwood NP	REDW
Montezuma Castle NM	MOCA	Richmond NBP	RICH
Moore's Creek NMP	MOCR	Rio Grande River	RIGR
Morman Pioneer NHT	MOPI	Rock Creek Park	ROCR
Morristown MHP	MORR	Rocky Mountain NP	ROMO
Mound City Group NM	MOCI	Roger Williams NM	ROWI
Mount McKinley NP	MOMC	Roosevelt Campobello Intl. Park	ROCA
Mount Rainier NP	MORA	Ross Lake NRA	ROLA
Mount Rushmore NM	MORU	Russell Cave NM	RUCA
Muir Woods NM	MUWO	Sagamore Hill NHS	SAHI
Natchez Trace Parkway	NATR	Saguaro NM	SAGU
National Capital Parks Central	NACC	Saint Croix Island NM	SACR
National Visitor Center	NAVC	Saint Croix NSR	SACN
Natural Bridges NM	NABR	Saint Paul's Church	SAPA
Navajo NM	NAVA	Saint-Gaudens NHS	SAGA
New River Gorge NR	NERI	Salem Maritime NHS	SAMA
Nez Perce NHP	NEPE	San Antonio Missions NHP	SAAN
Ninety Six NHS	NISI	San Jose Mission NHS	SAJO
Noatak NM	NOAT	San Juan Island NHP	SAJU
North Cascades NP	NOCA	San Juan NHS	SAJH
Obed Wild & Scenic River	OBWI	Santa Monica Mountains NRA	SAMO
Ocmulgee NM	OCMU		

ORGANIZATIONAL CODES (continued)

<u>PARK</u>	<u>CODE</u>	<u>PARK</u>	<u>CODE</u>
Saratoga NHP	SARA	Yosemite NP	YOSE
Saugus Iron Works NHS	SAIR	Yucca House NM	YUHO
Scotts Bluff NM	SCBL	Yukon-Charley NM	YUCH
Sequoia NP	SEQU	Zion NP	ZION
Sewall-Belmont House NHS	SEBE		
Shenandoah NP	SHEN		
Shiloh NC	SHIL		
Shiloh NMP	SHIO		
Sitka NHP	SITK		
Sleeping Bear Dunes NL	SLBE		
Springfield Armory NHS	SPAR		
Statue of Liberty NM	STLI		
Stones River NB	STRI		
Stones River NC	STRV		
Suitland	SUIT		
Sunset Crater NM	SUCR		
Thaddeus Kosciuszko NM	THKO		
Theo. Roosevelt Birthplace NHS	THRB		
Theo. Roosevelt Inaugural NHS	THRO		
Theo. Roosevelt Island	THRI		
Theo. Roosevelt NP	THRO		
Thomas Stone NHS	THST		
Timpaganogos Cave NM	TICA		
Tonto NM	TONT		
Touro Synagogue NHS	TOSY		
Tumacacori NM	TUMA		
Tupelo NB	TUPE		
Tuskegee Institute NHS	TUIN		
Tuzigoot NM	TUZI		
Upper Delaware River	UPDE		
Virgin Islands NP	VIIS		
Voyageurs NP	VOYA		
Walnut Canyon NM	WACA		
War in the Pacific NHP	WAPA		
Washington Monument	WAMO		
Whiskeytown NRA	WHIS		
White House	WHHO		
White Sands NM	WWSA		
Whitman Mission NHS	WHMI		
William Howard Taft NHS	WIHO		
Wilson's Creek NB	WICR		
Wind Cave NP	WICA		
Wolf Trap Farm Park	WOTR		
Wrangell-St. Elias NM	WREL		
Wright Brothers NM	WRBR		
Wupatki NM	WUPA		
Yellowstone NP	YELL		
Yorktown NC	YORK		