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**THE ROLE OF THE  
NATIONAL PARK SERVICE  
NATURAL RESOURCES  
MANAGER**

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THE ROLE OF THE NATIONAL PARK SERVICE NATURAL RESOURCES MANAGER

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## PREFACE

One year ago, in 1979, we published the first report in the Biology Series of the University of Washington Cooperative Park Studies Unit. The report was authored by Dr. Bruce Kilgore and was based on his presentation to our regional science/resources management conference. It dealt with the relationships and mutual responsibilities of scientists and managers in the National Park Service, and the unique role of the natural resources manager.

The concept of the natural resources manager and his/her role within national parks is expanded upon in this report by Ro Wauer, a well-reputed expert with long experience in resources management and research in the National Park Service. It will help administrators, scientists, and others concerned with natural resources evaluate the present and future role of this important, wide-ranging, and difficult position.

The paper, in slightly different form, was originally presented at the Second Conference on Scientific Research in the National Parks in San Francisco, November 1979.

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## INTRODUCTION

The National Park Service ranger has long been responsible for the dual role of resources management and law enforcement. For years the "man in green" was able to budget his time to do both jobs well. Law enforcement was only a fraction of what it is today and resources management usually was little more than a matter of policing the environmental status quo. Today, an ever-increasing workload and new technology for managing and protecting park resources, visitors and facilities have greatly enlarged the task. A park ranger seldom has time and energy for more than visitor services and law enforcement. When push comes to shove, management of resources becomes a secondary responsibility. The professional, multi-disciplinary park ranger has, for all practical purposes, become an antique.

In a number of the larger and more progressive natural parks, where resources management is recognized as an independent program, specialists are given this responsibility. However, the majority of these individuals are specialists in only one or a few of the necessary elements of natural resources management - such as wildland fires, ungulates, caves - rather than in the management of entire natural systems. The few resources management generalists usually are former park rangers or interpreters with little state of the art resources management education or training. There are very few cases where a park's natural resources manager is clearly proficient in coordinating a complicated program of this kind.

The solution to this dilemma must begin with the realization that the park ranger can no longer be all things to all people. Adequate management of a park's natural resources requires a catalyst in the form of a person who is responsible for implementation and monitoring, relates to the "big picture," has the time and staff to do it correctly, and talks to managers, scientists, planners, interpreters, and on-site crews who physically undertake the work. This person is the natural resources manager (NRM), a knowledgeable individual at the park level who interacts with key people in preserving the area resources.

The development of a professional natural resources manager requires careful selection interested, qualified people, training them in the techniques of resources management, and supporting the activities for which they will be held responsible. Those activities form the basic elements of the role of the NRM and are essential to fulfill the mandate given the National Park Service to perpetuate natural resources for future generations.

## RESPONSIBILITIES OF THE NATURAL RESOURCES MANAGER

### 1. Resources Management Plans and Action Plans

The basic concept of National Park Service resource management revolves around approved resources management plans that are based upon area management objectives. Each plan must document the area's resources management program; it must describe all current and anticipated activities for managing the park's natural resources. These activities may be characterized as maintenance and/or monitoring: maintenance activities are those that are cyclic in nature and are integral parts of a park's work program; monitoring projects are regularly scheduled activities that serve as early warning systems for internal and external threats to park resources, and which also provide checks upon prescribed maintenance programs. All monitoring projects must be based upon sound scientific research and, in most cases, are eventually maintained by the park. When base-line scientific data for a specific project are unavailable, obtaining them must become a park's primary research objective.

The area natural resources manager is responsible for the resources management plan. He/she should provide liaison between the park, regional resources management plan coordinator, and the Denver Service Center or regional planners. The NRM should make sure that all concerned employees participate not only in the development of the initial draft of the plan but also subsequent revisions. He/she must provide continuity for development, content, review, approval, implementation, and updating and revision of the plan.

Resources management programs which may be controversial or which may significantly affect the environment should evolve as action plans designed to satisfy National Environmental Policy Act requirements, and should be considered a section of the area's resources management plan.

Action plans address a single but significant issue that may be controversial or may significantly affect the environment and therefore require an environmental assessment. Examples include plans for management of backcountry, caves, fire, rivers, essential habitat, and feral animals. Each should be included in the appendix of the park's resources management plan.

Initial drafts of action plans often should be developed during an early, pre-implementation stage, even though complete data are not yet available. Such interim plans serve a useful function in acknowledging possible shortcomings in data and strategy: for example, an interim burro management plan may point out the problem and the obvious impacts upon the environment, discuss research accomplished to date and that required to provide a sufficient database for management alternatives, as well as the steps leading to a finalized action plan.

## II. Natural Resources Activities

Management of a park ecosystem must include strict protection as well as active manipulation. Houston (1971) pointed out that park management "generally involves preventing or compensating for man's altering of natural ecological relations." Bourliere (1962), in a committee report to the First World Conference on National Parks, defined management in national parks as follows:

Management is defined as any activity directed toward or maintaining a given condition in plant and/or animal populations and/or habitats in accordance with the conservation plan for the area. A prior definition of the purpose and objectives of each park is assumed.

These activities may include:

A. Aquatic Resources Management. The principal aquatic resources management objective is the monitoring of water quality and quantity, specifically as they relate to natural resources, and the health and safety of park visitors and employees. Additional responsibilities may include succession or stability of wetlands, coastal zone management, flood protection, water rights, and review of assessments for adjacent projects by other agencies.

B. Fisheries Management. These activities are related principally to recreational fishing, along with species and habitat preservation (the long-range stability of fish populations). Fisheries management may include stream, lake, or bay fish surveys, creel censuses, fish planting in recreation zones, or the restoration of native species. Species restoration projects (for all animals and plants) require thorough study and analysis to determine the feasibility and potential impact upon other species, the development of an action plan, the actual reintroduction of the species, and long-term monitoring to assess the action taken and results. The majority of fisheries management programs require considerable liaison with state agencies and, when endangered species are involved, consultation with the U.S. Fish and Wildlife Service or National Marine Fisheries Service.

C. Wildlife Management. Most of these activities relate to the health and stability of native populations of highly visible or indicator species, from large ungulates to birds and insects. Wildlife management projects may address overpopulation of elk or bison; diseases, such as rabies, plague, encephalitis; hazardous species, such as bears and rattlesnakes; and reintroduction of native species. Techniques used for monitoring wildlife populations may include a variety of index counts or population transects. Specific actions to correct overpopulations or diseases may include reduction by killing or trapping and disposal by other agencies. While trapping and removal activities usually are routine duties, they may require research or assistance from another agency when an outbreak of infection or disease is detected. The relocation

of a native species to another part of the park should be carried out for endangered and rare species and when disposition is within sound ecological principles.

D. Vegetation Management. These projects include habitat or species perpetuation and control. A long-term monitoring program should be established within every extensive natural zone to provide an early warning system for impact by visitors, native or exotic animals and plants, pollutants from within or outside the park, and other threats. Specific projects may include insect and disease control; reduction or elimination of exotics; surveillance of hazardous species in visitor use zones (i.e., toxic species); species restoration; and plantings. Plantings of native species may be necessary for erosion control and land rehabilitation following natural or human disturbance at roadcuts, trails, campgrounds, and other sites.

E. Fire Management. An effective fire use, prevention, and suppression program is required in every park. The area natural resources manager should be involved with all its phases and work closely with the regional office, the Office of Fire Management at Boise (a field office of the Division of Natural Resources, WASO) and other agencies' fire management offices. The NRM must provide the continuity for all phases of fire management: the fire management (action) plan, prevention, suppression, development of research proposals, and data-gathering. In some areas the development of fire prescriptions may be necessary.

F. Cave Management. This function relates to the preservation and perpetuation of natural underground systems, along with visitor and employee safety. All activities must be based upon sound information and a classification system developed in accordance with the Interagency Dual Classification System. A monitoring program is vitally important for protecting natural formations or endangered or unique animal and plant species and/or their essential habitats. Cave management (action) plans should document the details of monitoring programs as well as any actions underway or planned such as gating, maintenance, restoration, or other special uses.

G. Backcountry Management. All wilderness areas and extensive natural areas should be managed in a prescribed manner documented within backcountry management (action) plans. Documentation should include the park's strategy for visitor use of such areas as backcountry campsites, trails, and riverways. It may include a reservation system, but in all cases it must include a monitoring program designed to indicate overuse in its early stages.

H. Frontcountry Management. Frontcountry management requires the same strategy as the backcountry. It considers campsites, trails, roads, and other facilities and resources that attract the greatest number of park visitors. A sound data base and monitoring program are vitally important for frontcountry management. Internal overcrowding and abuse as well as adjacent developments (residential, commercial and industrial) require continual monitoring for their effects upon park values.

I. Management of Endangered and Threatened Species. This function must be an active and vigorous one for all areas containing endangered and threatened species. It begins with the identification and full protection of all species and their habitats. This necessitates acquisition of sound scientific information on all of the species and their habitat requirements, working with scientists to develop management strategies for perpetuating the species. Official consultation with the Fish and Wildlife Service or National Marine Fisheries Service should be instituted during any action plan development and prior to any actions taken that could influence the well-being of the species.

J. Management of Non-native Species. These activities may include the elimination or reduction of feral cats and dogs, goats and sheep, cattle and horses, burros, fish, tamarisk, ailanthus, kudzu, Japanese honeysuckle, and a wide assortment of other exotic animals and plants. Removal of non-native species prior to population expansion is essential to a park managed for its natural values.

K. Biocide Use and Monitoring. The numerous restrictions and the seriousness of potential effects of some herbicides, insecticides, and fungicides upon the environment and people require concern and coordination at the park, region, and Washington levels. Activities include determination of the need for using a biocide within a park, request for approval, proper use by a trained and accredited applicator, and the monitoring of results, as well as effects upon the environment. The area natural resources manager must be involved with all phases of the program and be sufficiently knowledgeable to make good decisions.

L. Weather Monitoring. The collection of climatic data, such as temperature, precipitation, wind speed and direction, humidity, and snow depth are essential for understanding a park ecosystem. These kinds of data are prerequisites for a number of management decisions and action plans, such as those for fire and backcountry.

M. Air Quality Monitoring. The Clean Air Act Amendments of 1977 granted the National Park Service authority and responsibility to protect air quality and resources affected by air pollution in the parks. Forty-eight areas (parks over 6000 acres and wilderness areas over 5000 acres) were designated as "mandatory Class I areas," which allows virtually no deterioration of air quality and imposes the strictest protection for "air quality related values," including visibility. Protection of these resources under the act makes it imperative to establish long-term monitoring programs that document base-line air quality levels and identify the thresholds for resources damages caused by air pollution.

N. Coal and Oil, Mining, and Minerals Monitoring. America's search for energy sources and the possible impacts in developing and processing phases provide an array of internal and external alterations to park resources, which require base-line data-gathering and long-term monitoring. All current, authorized activities, such as drilling of gas and oil wells and construction of pipelines, must be monitored and





As soon as the Investigator enters the park, the area natural resources manager, in lieu of a park-based research scientist, should become the principal Park Service liaison. The NRM's key responsibilities begin with an orientation, the issuance of suitable permits, and discussion of mutual obligations (Wauer, 1974), prior to the start of the field studies.

During the course of the field investigations, the area natural resources manager should: (a) work with the Investigator occasionally to become familiar with methods being used; (b) communicate mutual needs; (c) provide the Investigator with the Park Service's philosophy and objectives so that the researcher's attitude is compatible; and (d) coordinate occasional seminars for the park staff to allow feedback that may greatly benefit the program. Park managers and interpreters can gain considerably from an early awareness of the investigations so that by the time the final reports are prepared the park staff is already aware of the general findings and the Investigator may prepare his report with the park's management and interpretation needs in mind.

The review of the final report, prior to acceptance, should be made jointly by the area natural resources manager and regional chief scientist. They may also coordinate review by other members of the park staff and other scientists, if required. Final approval for contract investigations must be provided by the contracting officer's representative, usually the regional chief scientist, after consultation with the area natural resources manager.

**B. Report Implementation.** The final, accepted report should be thoroughly reviewed for management and interpretive implications. Some of the recommendations and conclusions may have been developed after the data-gathering phase, during the final analysis, and therefore may not have been evident during earlier phases of the study.

Although basic recommendations may be developed in the regional office and presented to the area superintendent, implementation of the research results must be left to the park staff. This activity becomes one of the most significant parts of the entire resources management program and is largely dependent upon the effectiveness of the area natural resources manager.

If the park staff was kept informed of the findings as the study progressed, it is unlikely that there will be any new information which will revolutionize the park's management and interpretive programs. However, a seminar on the final report can be a valuable method of reviewing the research results and program changes that may be required. A properly handled seminar on a management-oriented research report can be a very pleasant and worthwhile experience for all participating park staff.

It is then time for the natural resources manager to update the area's Resources Management Plan. New and revised management strategies and research needs should be identified and the updated programming sheets must reflect the area's priorities and funding requirements.

#### IV. Related Programs

There are numerous other natural resources management functions that can benefit field areas, and which should be coordinated by the park natural resources manager. Some of the major ones are:

A. Environmental Concerns Committee. Each park should have an environmental concerns (awareness) committee to evaluate specific internal and external natural resource concerns, analyze those concerns, and develop recommendations for resolving the problems for presentation to the superintendent. The committee should be chaired by the natural resources manager, or in appropriate cases co-chaired by a suitable person outside of the park. This committee should address topics other than the major ones in the natural resources management plan: environmental education, housing area problems, recreational activities and park neighbor relationships. A productive environmental concerns committee could provide important interrelationships in and out of the park which could benefit every park program.

B. Agreements with Other Agencies. Most parks have cooperative agreements with state and other federal agencies that relate to natural resources management programs listed in Section II. The area natural resources manager should coordinate any activities resulting from those agreements.

C. Special Use Permits. The responsibilities of the natural resources manager include administration of special-use permits for acceptable activities such as grazing; off-road use of vehicles; utility and transportation corridors and rights-of-ways; mining and mineral leases; collection of specimens; and control of pets.

D. Restricted Species List. Every park should develop a list of animals and plants that require special protection, such as unique forms, those that should not be taken at certain times of the year, and endangered and threatened species included on appropriate federal and state lists. A restricted species list specific to the park provides ready reference when collecting of specimens is being considered.

E. Special Areas for Monitoring. The Research Natural Area program, currently under the administration of the Heritage, Conservation and Recreation Service, establishes designed areas within natural zones of some parks. Research Natural Areas exemplify the inherent character of a park's ecosystems and should be suggested as research zones by the natural resources manager for long-term monitoring of the ecosystems' health and stability. Research natural areas may also provide controls for research being conducted on modified areas outside the parks.

A few of the larger natural parks are designated as "Biosphere Reserves." Like Research Natural Areas, they require special attention and the highest priority should be given to base-line studies and long-term monitoring programs. Biosphere Reserves show the finest examples of the world's biomes dedicated to the perpetuation of whole ecosystems.

F. Information Base. The care of information is an extremely important phase of a park's natural resources management program. Activities include the storage and proper use of the park's data base for the ecosystem map and information systems. Park files, library, and collections become an important and useful part of the process. The natural resources manager must work closely with area interpreters to make sure that relevant information is stored and available to the park staff, planners, and investigators.

G. Ecosystem Map. The ecosystem map is a visual display of resources information, involving the development of several overlays on a base map of the park. Overlays may include regional features, topography, geologic features, land use and ownership, soils, hydrology, vegetation, wildlife, cultural sites, and facilities, and must be designed to be integrated into the area's information management systems.

H. Information Management Systems. Every park eventually will make use of several information management systems designed to provide managers and interpreters with instant information on a wide variety of subjects. Current programs available include the following systems: bear information management, backcountry use information, pesticide monitoring, cave radiation monitoring, a series for fire management, and one for developing endangered and exotic species management. The natural resources manager must coordinate the data-gathering and reporting phases of the system.

I. Public Relations. Any successful natural resources management program must include good public relations; poor public relations can impair or destroy even the most logical, well-documented program. Responsibilities include the review of all news releases and other public information that relate to the area's natural science and natural resources management activities.

## DISCUSSION

The history of resources management in the National Park Service often has been one of trial and error where success was due more to individual personalities than to sound guidelines and good information. Too many decisions have been made by gut reaction rather than by following a systematic approach. Such crisis management has led to results that are fragmented and short-lived rather than objective, consistent, and enduring.

Numerous authors have criticized crisis management in the National Park Service and called for a systematic approach to resources management (Sumner, 1967; McDowell, 1968; McLaughlin, 1975; Smathers, 1975; Wauer, 1976; Kligore, 1978). Their calls for a better relationship between science and management appeared to be partially answered by the 1978 realignment of the Washington Office (Departmental Manual, 1978). That action blended the functions of natural science and natural resources management and provided within the same office the necessary supporting elements of information management, technology, research evaluation, and environmental education.

Referring to the central office reorganization, National Park Service Director William Whalen stated: "We are convinced that these efforts will move us into an organizational posture with much more efficiency and effectiveness that will allow us to carry out our goals of better service to the constituency of the National Park Service."

Later, Assistant Secretary of Interior Robert Herbst stated: "As a first step, the Park Service will be emphasizing the development of sound resource management programs based on the best research data obtainable. Resource managers at the site will free the superintendent to captain his whole ship with a full set of scientific data pertaining to the park site. Informed scientific resource managers will act as liaison between the scientists and land managers, and I expect that will be good news to many of you."

In spite of those far-sighted intentions, a review of the situation today reveals that the Service's response to natural resources management not only has failed to keep pace with the issues but has slipped a few points below its position prior to reorganization.

Reasons for the servicewide shortcomings can be identified and categorized as: 1) inadequate personnel to respond to the numerous issues; 2) inadequate understanding of the complexity of the issues; 3) inadequate training programs to bridge the widening knowledge gap; 4) inadequate information for decision-making; and 5) inadequate support from the National Park Service directorate and Congress for natural resources management/ natural science activities; the fifth deficiency will be dealt with in the Conclusion.

1. Inadequate personnel is a result of overly stringent personnel ceilings and insufficient funds. The principal Washington Office support team has been decimated during the last 18 months. The Division of Natural Resources central office was authorized 13 permanent and 16 less-than-full-time positions in the 1978 fiscal year, but the division's 1979 fiscal year program was reduced to 8 permanent and 1 less-than-full-time position. This lack of personnel who are responsible for policy and its interpretation results in the loss of continuity and cohesiveness and encourages the 10 regions to go their separate ways.

The paucity of resources management personnel in the field is just as critical. Staff reductions in recent years in most cases have reached the point at which management of park resources is little more than a secondary responsibility.

The areas which have the greatest needs for natural resources managers and scientists must be examined in terms of actual and potential resources problems. A system for analyzing servicewide threats is already underway through a questionnaire sent to the parks to obtain information for a "State of the Parks Report," required by Congress early in 1980. The Service should take advantage of these data, thoroughly analyze area requirements, and then provide assistance where it is needed.

An earlier example of a natural resources rating system used in the Southwest Region is a Resources Management Evaluation Form (Table 1). Scores obtained by this technique for 32 national parks ranged from maximums of 2435 for Big Bend National Park and 2287 for the dual parks of Carlsbad Caverns and Guadalupe Mountains, to minimums of 182 for Aztec Ruins National Monument and 181 for Chamizal National Memorial. Table 2 illustrates the point spread for the 32 units and the assessment made on the personnel requirements to support the natural resources management programs for each. Utilization of these two techniques for obtaining natural resources management indices for all of the national parks would provide an excellent base-line for establishing priorities for positions and funds.

2. The second deficiency is that a large number of Park Service employees at all levels do not comprehend the complexities and magnitude of the issues that are bombarding the parks. The problem is not just the inadequate number of personnel, but their inability to identify problems and to make decisions in our complicated world of technology and priorities.

It is time that the profession of resources management became recognized as a highly skilled discipline that is separate and apart from law enforcement, interpretation, maintenance, and administration. The growing resources issues in the parks must be addressed by people trained in that discipline, just as individuals are trained in other skills. The cadre of natural resources managers must increase substantially but not at the expense of other functions. It is time we acknowledged the necessity of a career ladder in natural resources management.

This career ladder should be comparable to others in the National Park Service. The stumbling block to this change is the historic role of visitor services, which includes protection of park visitors and facilities as well as park resources. That personnel category, recognized as the 025 Series by the Office of Personnel Management, should be divided into two functions: protection of visitors and facilities; and protection of natural and cultural resources. The alignment of park divisions does not necessarily have to be organized exactly the same way. The critical factor is that each of the functions must operate fully within its own areas of responsibility and not be utilized elsewhere except in major emergencies.

A park cannot function properly without maintenance, interpretation, law enforcement, resources management, and the support of administration. If the service is to operate efficiently in the 1980s, it must utilize all of these professions to the utmost.

3. The third point is the education of personnel currently serving in the capacity of natural resources manager or specialist, or new people in the journeyman category. Table 3 illustrates personnel categories, target groups, and training areas that should be included in a special training program. This effort must have full support of the directorate and be implemented immediately if the service is to meet the demands already upon it.

Table 1

RESOURCES MANAGEMENT EVALUATION for \_\_\_\_\_  
park area

ELEMENTS	CRITERIA FOR RATING	POINTS
I. Resources Management Plans	# of Project Statements	
II. Resources Management Functions		
A. Aquatic Resources	# of Water Quality Monitoring Stations X Samples Types Taken . . . . . # of Miles of Recreation Waterways . .	
B. Fisheries	# of Monitoring Projects X Samples Taken Annually . . . . . # of Reintroduction Projects X 10 . .	
C. Wildlife	# of Monitoring Projects X Field Days Utilized Annually . . . . . # of Reintroduction Projects X 10 . . # of Hazardous Species Managed X 5 . .	
D. Vegetation	# of Monitoring Projects X Samples Taken Annually. . . . . # of Reintroduction Projects X 10 . . # of Hazardous Species Managed X 5 . . # of Rehab/Restoration Projects X 5 . . # of Forest Insect & Disease Control Projects X 5 . . . . .	
E. Fire	Mean # of Fires Annually X 15 . . . . .	
F. Caves	# of Monitoring Projects X Samples Taken Annually . . . . . Active Radon Gas Monitoring Project X5	
G. Endangered & Threatened Species	# of Species Known to Use Park . . . . . # of Habitat Mgt. Projects X 15 . . . . .	
H. Non-native Species	# of Species Known to Use Park . . . . . # of Control Projects X 15 . . . . .	
I. Biocides	# of Biocides Currently Approved X 10.	
J. Weather	# of Operating Weather Stations . . .	
K. Air Quality	# of Operating Monitoring Stations X # of Instruments Used in Each X 2 . .	
L. Coal and Oil, Mining and Minerals	# of Monitoring Projects X 10. . . . . # of Energy Projects within 50 Miles of Park X 20 . . . . .	

ELEMENTS	CRITERIA FOR RATING	POINTS
	# of Energy Projects within 150 miles of Park X 5 . . . . .	
M. Backcountry	# of Camping Sites in Backcountry Total Miles of Trails in Park. .	
N. Frontcountry	# of Camping Sites in Frontcountry Total Miles of Roads in Park . .	
III. Action Plans	# Approved or In Development X 20	
V. <u>Research</u>		
A. Liaison with Investigators	# of NPS Funded Projects X 10 . . # of Principal Investigators Working in Park . . . . . # of Research Permits Issued/Year	
B. Report Implementation	# of Final Reports Received/Year from NPS Funded Investigators X 5 # of Final Reports Received/Year from Other Investigators . . .	
IV. <u>Special Programs</u>		
A. Environmental Concerns Commit.	Active Committee X 10 . . . . .	
B. Agreements w/other Agencies	# of Agreements X 10 . . . . .	
C. Special Use Permits	# of Permits Issued/Year X 5 . . .	
D. Restricted Species List	# of Species on List . . . . .	
E. Research Natural Areas	# of R.N.As. in Park X 10 . . . .	
F. Man and the Biosphere	If Designated Park, 30 points . .	
G. Resources Basic Inventory	# of Area Bibliographic References (post-1960) Accumulated . . . .	
H. Ecosystem Map	# of Map Overlays X 10 . . . . .	
I. Management Info. Systems	# of Active Programs X 20 (BIMS, AFFIRMS, Backcountry, etc.) . .	
J. Public Relations	# of Action Plans X 15 . . . . .	
	1/10 of Total Points in Section II	
TOTAL POINTS . . . . .	I. Resources Management Plans . . II. Resources Management Functions III. Action Plans . . . . . IV. Research . . . . . V. Special Programs	



Table 2

## SUMMARY OF

## RESOURCE MANAGEMENT EVALUATIONS FOR AREAS OF THE SOUTHWEST REGION, NPS

AREAS	POINTS	ANALYSIS
Chamizal	181	Areas with points from 181 to 290 contain resources that apparently are of the type that require minimal attention from the Regional Office of Natural Resources Management, with the exception of priority studies or problems as documented within approved Resources Management Plans.
Aztec ruins	182	
Ft. Smith	184	
Arkansas Post	225	
Pecos	228	
Hubbell Tr. P.	237	
Gran Quivira	288	All of the areas below possess significant resources and require constant attention from the Regional Office of Natural Resources Management, as well as special research studies as outlined within the area Resources Management Plans.
Ft. Union	290	
Lake Meredith	363	
Alibates	397	
El Morro	401	
Canyon de C.	411	
Ft. Davis	417	
Hot Springs	435	
Chalmette	447	
Navajo	478	
Pea Ridge	493	All of the areas listed below should possess a major research program with a multidisciplinary university, and special attention must be provided these areas by the Regional Office of Natural Resources Management.
LBJ	544	
White Sands	629	
Capulin Mt.	631	There is ample evidence that the areas listed below must have a full-time Resources Manager on their staff. These areas also require a major research function with a multidisciplinary program.
Chickasaw	723	
Big Thicket	730	
Bandelier	954	
Padre Island	1302	
Chaco Canyon	1313	
Amistad	1454	
Wupatki/SunC	1482	
Buffalo River	1987	All of the areas below require both a full-time Research Biologist as well as a full-time Resources Manager on the park staffs.
CaCa/GuMo	2287	
Big Bend	2435	

The point spread of areas within the Southwest Region was derived from a questionnaire (Resources Management Evaluation) that was completed by each of the areas.





The abundant internal and external dangers to the resources of the national parks form a tightening spiral that has become the principal concern facing the National Park System today. We cannot rely on the same methods for resolving problems in the 1980s that pulled us through crises in the 1950s and 1960s. And yet we should learn from history. We must take a fresh and innovative approach to facing the threats; this begins with the recognition that good resources management is a program with a unique identity throughout the Service that not only works to solve today's problems but identifies and prevents those of tomorrow.

Resources management must surface as a keystone responsibility with sufficient personnel and support to deal with the issues of today's world. The Director of the National Park Service should initiate a major, innovative program immediately to counteract the avalanche of impacts that are threatening the very survival of the Service.

The Director should take full advantage of the "Threats to the Parks" data base and use it for developing a comprehensive plan to save the park resources in the same fashion that MISSION 66 met the grave need for new facilities in that decade. A crash program is needed that will truly remedy the serious deficiencies in resources protection within the parks. Such a program must be designed with the resources in mind rather than political expediency. A well-documented "Plan to Save the Parks" cannot help but appeal to the imagination of the American public and the Congress.

The "Plan to Save the Parks" should be a multiple-action initiative, addressing the many facets of natural resources problems and their early resolution in order to ensure perpetuation of the resources. It should define a new natural resources management structure through extensive on-site training programs established by the regional offices. It should place a greater emphasis on the development and use of resources management plans and action plans.

The "Plan to Save the Parks" must also serve as the principal stimulant for obtaining renewed support for the National Park Service from Congress and from the citizenry. Finally, as MISSION 66 did in the 1960s, it must provide a bond to bring Service employees together again.

The challenge of the 1980s is far more critical than that of past decades. The National Park System is facing threats as never before. The road to resources preservation must be paved with a strategy for saving those resources. Natural and cultural resources form the foundation on which the national parks are built; our National Park Service cannot afford to relax until they are safe.

#### ACKNOWLEDGMENTS

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### EXPLANATION OF TABLE 3

Although the workshops are self-explanatory, the six training areas require some additional clarification.

Advanced Concepts. A seminar should be conducted to instill or reaffirm a preservation ethic and to clarify a contemporary approach to preservation by application of management practices with a systems approach to natural resources management. It should include National Park Service mandates, economic and political constraints, and trends.

Natural Systems Management. This seminar or course would stress natural systems and natural resources management in the National Park System, and its evolution through the early history to National Environmental Policy Act and its influence on the planning process. It should include current review of other federal land-managing agency missions, programs and interrelationships with National Park Service, the use and value of Memoranda of Understandings, the Cooperative Park Study Unit, and "critical issue" management.

Natural Resources Management Techniques. A course should be designed to cover National Park Service responsibilities in natural resources management and sources of information. It should include general techniques and stress the importance of accumulating a natural resources management handbook for the area.

Natural Resources Planning and Implementation. This course should include a full spectrum of the National Park Service planning process as it relates to natural resources management and include problem identification and analysis, resources management plans, liaison with researchers and other agencies, data implementation, resources basic inventory, ecosystem maps, and management information systems. It is a practical course that starts with laws and policies, stresses planning, and the incorporation of new information and management decisions in the plan.

Natural Resources Management in Historic Areas. This course should include basic ecosystem concepts, history of resources management, laws and policies, and resources management planning. It should stress the principles of natural resources management and identify internal and external threats to the cultural values of the area.

Basic Ecosystem Concepts. This course is designed to teach basic ecological concepts to new personnel or to provide mid-career training. It includes laws and principles of ecology, and analysis of man and nature in the National Park System. Examples of ecological principles will be drawn from the Service's experience and problems with fire management, fish and wildlife, biocides, exotic species, and similar areas of concern.

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