A HISTORY OF NATURAL RESOURCES MANAGEMENT
WITHIN THE
NATIONAL PARK SERVICE

A THESIS
by
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Gordon Olson
In a recent speech Russell Train, Undersecretary of the Interior, declared:

As radioactive wastes, pesticides, and the products of fossil fuel combustion are distributed over the earth, we are beginning to understand that we live in one biosphere - a thin film of air, water, and soil on a small planet.

The parks can no longer be isolated from the environment in which they exist, nor can they survive if the national quest for a quality environment fails.

As we look past 1972, we may see the national parks serving the purpose once served by the canary in the miner's cap, whose stilled voice signaled the presence of lethal forces. In a very real sense, the parks, with their fragile ecologies, constitute a Distant Early Warning line, warning of the consequences that surely will follow if we continue to abuse our environment. (288)

The young people of today are the lawmakers, the scientists, the industrialists, the conservationists, the cattlemen, and the lumbermen of tomorrow. It is vitally important that they learn today the values of the national parks, and the principles underlying their preservation. For they will have the say tomorrow as to what becomes of these properties of the people. Newton B. Drury (83)

This thesis is dedicated to helping those who will manage our park resources in the future better understand how those resources have been managed in the past. Hopefully, lessons will be learned from the past and errors will not be repeated.
ABSTRACT

OLSON, Gordon Cooper. A History of Natural Resources Management within the National Park Service. 366p. (Craig C. Chase, PhD)

Historical research was conducted to develop a written record of the evolution of natural resources management and closely related activities of the National Park Service, U. S. Department of the Interior. The history starts in 1872, with the creation of Yellowstone National Park, and ends with the appointment of William Mott as Director in 1985. Subjects addressed include wildlife management, geologic programs, scientific publications, shoreline management, land protection, forestry, budgets, and administrative organizations. The record provides documentation of the history of the agency and explains the development of policies related to the management and protection of park resources.
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Chapter 1

INTRODUCTION

General Comments

With the establishment of Yellowstone National Park in 1872, the United States Congress mandated that the natural resources of that park be preserved for the enjoyment of future generations. Preservation of park resources continued as a central theme with the authorization of parks subsequent to Yellowstone as well as with the creation of the National Park Service (NPS) in 1916.

A brief examination of the activities of the first civilian superintendents of Yellowstone, of the U.S. Cavalry in Yellowstone, Yosemite, and Sequoia National Parks, and, finally, of the National Park Service itself, reveals a pattern of vacillation in philosophies related to natural resources management. This resulted in wavering policies and resultant activities related to the preservation of the resources within the National Parks.

A general trend of improved resource preservation developed within the National Park Service during the early 1970s. Although the Service was more actively involved in natural resources management and natural science research than ever before in agency history during this decade, the ability of the Service to protect park resources had, at best, reached a plateau. In
many instances the Service was actually losing ground in its fight for resource preservation. This situation was a direct result of increasing visitor use, a steady increase in the number of parks which became the Service's responsibility without associated increases in personnel or funding, economic conditions which made park management more difficult, an energy crisis which placed greater pressure on U.S. energy sources, and a general socio-industrial expansion of the nation.

Between 1980 and 1983 a renewed emphasis was placed on the sound management of the natural resources of the National Park System. This re-emphasis was due to: (1) pressure by special interest groups who focused attention on threats to the integrity of park resources, (2) a political atmosphere which required executive departments to focus on management efficiency, and (3) changes in National Park Service leadership.

That renewed interest has encouraged the author to take on the task of developing a history of natural resources management in the United States National Park Service.

Statement of the Problem

Although numerous histories of the National Park Service and its activities have been written, none of them address natural resources management solely and comprehensively. Infact, most give very limited attention to this important function of the agency. Those that are specific to this subject are limited in the number of years that they address. (82,165,199,178,4,85, 6,34)
A history of this sort should prove valuable on several fronts. First, it is hoped that this report will contribute to the general body of historical documentation of the Service. Second, the report may assist other park agencies which rely on the National Park Service for recreation management extension information. An understanding of the successes and failures of the NPS may be of great value to those agencies. Finally, Park Service personnel should have an understanding of agency history to better appreciate the origin of current policies and programs. As with other park agencies, Service personnel may also be able to learn from past errors.

Scope and Method

This study has generated a comprehensive history of natural resources management within the United States National Park Service. The project was not intended to be exhaustive, but rather provides an overall picture of activities which occurred from the inception of national parks through the present. It addresses issues related to water, vegetation, soil, geology, wildlife, as well as land resources. Emphasis is placed on significant policy and organizational changes, controversial issues, and a representative sampling of routine resources management activities which give a feeling of what was transpiring throughout the System.

Research was conducted during the fall, winter, and spring of 1983 and 1984. During that time a considerable amount of effort was expended reviewing the files of the National Park
Service Archives in Harpers Ferry, West Virginia and the National Archives in Washington, DC. Numerous other libraries were consulted and some information was gathered through correspondence and interviews with current and former NPS employees.

A prospectus was developed for the project in the fall of 1983 and an outline was prepared in January of 1984.

The history is organized into chapters which coincide approximately with the periods of time during which each of the eleven Directors of the Service have been in office. Since park areas, which later became part of the National Park System, were in existence prior to the establishment on a National Park Service or the selection of any Directors, a separate chapter has been prepared to discuss activities which were conducted in these early parks. From that point, each chapter is arranged chronologically according to Directorship. Two exceptions to this are a nine month period when Arthur DeMaray was in office and the period when Ronald Walker, Gary Everhardt, and William Whalen served. DeMaray's administration was so short that it's discussion was combined with the account of his predecessor, Newton Drury. Since events which transpired during the Walker, Everhardt, and Whalen administrations are so closely related to each other the author felt that it would be less confusing to combine their explanation into one chapter. The final chapter is a discussion of some general trends and patterns and presents current philosophical and policy questions.

Each of these chapters first outlines the context in which resources management activities were occurring including
political and socio-economic events, significant legislation, parallel Service activities, and the qualifications of Service leaders; specifically the Director. Second, each chapter outlines the major issues, events, and activities which comprise the natural resources management function. Each chapter ends with a discussion of policy changes and an explanation of the change in agency leadership.

Although a discussion of context is provided with these chapters, a deliberate attempt has been made to limit that discussion to those concepts with a direct bearing on resources management. Other histories address parallel agency history adequately (195, 202, 177, 179, 288, 185, 187, 181, 203, 184, 198, 176).

**Background**

It is essential that the reader understand what the terminology "natural resources management" means prior to reading the body of this paper. For the purposes of this study, natural resources management is defined as an activity or measure taken to maintain or preserve the zoological, geological, hydrological, pedological, and atmospheric features of a park and to neutralize the effects of man or non-native species on those features.

A brief explanation of where natural resources management fits in park management is also worthwhile. Park management can be viewed as a system of components in which management of the natural resources is but one. Furthermore, many parks include cultural resources of prehistoric and historic significance which require management in much the same way as the natural resources.
Thus cultural resources management becomes the second component of park management. Superimposed on the cultural and natural resources is visitor use. In the case of the National Park Service, this component was mandated by the Yellowstone enabling legislation and the agency's Organic Act. Visitor use generally requires some form of visitor management. Finally, two other components have evolved which provide support to the first three. Maintenance provides a safe and functional built environment which supports resource managers and visitors alike. The administrative component provides essential budgetary and paperwork support to all other components.

A further explanation of the author's philosophy of natural resources management is critical to understand why certain facts are discussed in this history. The author feels that resources management consists of three principal elements. Of primary importance is the legislative element in which programs are given legal sanction. This element of management was vital during the early history of the national parks and rose to a high level of importance during the 1960s when numerous environmental laws were passed by Congress. A second element is comprised of resource management actions themselves, including planning and programming, monitoring, and implementation of day-to-day tasks (re-vegetation projects, hazardous tree removal, prescribed fires, herd reduction, etc.). The last element, which is closely related to management actions, is the research function. This element involves the analysis of problems and provides an array of possible management actions useful in resolving those prob-
lems. In some instances research may involve monitoring and it may lead to the development of legislation as a solution.

With these thoughts in mind, it is appropriate to move into an examination of the chain of events which have brought us up to 1985.
Chapter 2

YELLOWSTONE AND OTHER EARLY PARKS

Birth of the National Park Movement

Yellowstone National Park was established by an Act of Congress which was signed by President Grant on March 1, 1872. This, however, was not the first "national reservation" to be created for the benefit of the American people. Hot Springs National Reservation was set aside in 1832 and the Yosemite Valley of California was granted, by Congress, to the State of California, as a reservation, in 1864.

Between 1872 and 1890, Sequoia and General Grant, also in California, were established as national parks, as was Mackinac Island, Michigan. During this time, Yosemite was transferred back to the United States Government and established as a national park. Between 1890 and 1915, several other parks were created, including Mt. Rainier, Crater Lake, Wind Cave, Platt, and Glacier. Sullys Hill National Park, which was transferred to the Biological Survey on June 30, 1914, had also been established during this period.

Furthermore, in 1906 the Antiquities Act, which provides protection to archeological and scientific objects and grants authority to the President of the United States to establish national monuments by executive order, was passed. Promptly after the passage of this Act, Theodore Roosevelt set aside several national monuments. Thus, by the beginning of 1915,
thirty autonomous park units existed under a variety of titles including national parks (11), national monuments (17) and reservations (2).

Examining these units as a group reveals an interesting overall philosophy about the selection of parks and management of their resources. The following comments summarize that philosophy. Victor Cahalane, a prominent NPS biologist during the 1930s and 1940s, has stated that "in the United States, national parks were first chosen solely for the protection of scenery" (5). This statement might be broadened somewhat to include the fact that many of the first parks and monuments were established for the protection of natural curiosities. Thus, one finds examples of scenic grandeur as well as unique geologic, botanic, and zoologic features in all of these early parks. Frequently the concepts of the "largest", "oldest", and "sole" played a major role in gaining protection for the resources through legislation. (197,32,109) This trend manifests itself most vividly in the early national monuments. Little serious thought was given to management of parks as complete ecosystems. (5,196) This narrow philosophy would have a profound influence on the management of park resources for many years to come.

Beginnings of Natural Resources Management

Each of these early parks contributed to the beginning of natural resources management in its own unique way, but many of the activities and programs had striking similarities (185,187). The scope of this history, however, does not allow for a detailed
examination of each park. Yellowstone National Park will be used to exemplify those programs.

The First Years at Yellowstone

Immediately following the creation of Yellowstone National Park, the park was managed by a series of civilian Superintendents of varying capability. The experiences of these early Superintendents have been described as a "ramshackle affair" (184). H. Duane Hampton, in the book, How the U. S. Caval­ry Saved Our National Parks, has given us an outstanding description of these early follies:

Congress vested exclusive control of the Park's administration in the Secretary of the Interior, who was enjoined to make and enforce all regulations necessary to prevent trespassing; to insure preservation of the park from injury or despoilment; to retain in their natural condition 'all timber, mineral deposits, natural curiosities, or wonders' within the Park, and to guard against the 'wanton destruction of the fish and game ... and against their capture or destruction for the purposes of merchandise or profit.

Unfortunately the Act provided no specific laws for the government of the region; it neither specified offenses nor provided punishment or legal machinery for the enforcement of such rules as might be promulgated by the Secretary of the Interior. No appropriation was made for administering the Park, for constructing roads, or for protecting the Park from vandalism....

Nathaniel P. Langford, member and chronicler of the 1870 exploring party, was appropriately appointed the first Superintendent of the new National Park....

Attempting to supervise a large tract of wilderness with no funds at his disposal for protection or improvement, and no code of laws by which he could regulate the conduct of visitors to the Park, Langford found his position as Superintendent largely nominal.... No legal machinery was provided, no legal code was drawn, no offenses were defined, and no punishments were decreed. However, the Secretary of the Interior was authorized to "take all such measures as shall be necessary or proper to fully carry out the objects and purposes' of the act. With this provision in mind, Langford forwarded to the Secretary what he considered to be a comprehensive set of rules and regulations,
designed to prohibit all hunting, fishing, trapping within the park; cutting of timber without the permission of the Superintendent; mutilation of formations or the collection of specimens without the permission of the Superintendent.... No fires were to be kindled except when necessary and these were to be fully extinguished. Any violation of these rules was to be punished with 'severe penalties.' The 'severe penalties' were not enumerated because there were none. (184)

The need for funding and regulations as resource protection tools was well illustrated by a report given by General W. E. Strong, who was travelling through Yellowstone in 1875. Strong stated that "During the last five years the game has been slaughtered by the thousands of hunters who killed them for their hides alone." (184) This report was confirmed by another military figure, Captain William Ludlow (184).

Hampton goes on to make the point that other natural features of Yellowstone were also being vandalized. He cites another instance in which "two women, with tucked up skirts and rubber shoes, armed, one with an ax, the other with a spade, who were climbing about'" on a geyser formation with the intention of vandalizing the formation. (184)

Much of the destruction of the resources of Yellowstone was blamed on Langford. "If his administration seemed inept and inefficient, the blame rests not upon him, but upon Congress" (184). Langford served as Superintendent for five years and continually tried to get the Secretary of the Interior to approve his proposed regulations (185). In March of 1877, President Rutherford B. Hayes took office and appointed Carl Schurz as Secretary of the Interior replacing Secretary Delano. Shortly
thereafter, Langford was asked to resign and Philetus W. Norris was appointed as Yellowstone's second Superintendent (187).

Finally, on April 19, 1877, Secretary Delano approved enforcement of Langford's regulations, one day after Langford resigned. (185)

Norris, like Langford, appointed an Assistant Superintendent to help with the protection of the park. Finally, in 1880, Congress appropriated $15,000 for the operation of the Park. (184,185) Part of this appropriation was used to hire Harry Yount as the Park's "Gamekeeper." It may be appropriate to state that Yount was the first field resource manager to be employed in the national parks. Yount started work on June 21, 1880 and was paid $1,000 annually. Henneberger has described Yount's duties as including "reporting on the game and, if possible, preventing excessive slaughter." Henneberger has also indicated that he was Norris' chief hunter, and that he acted as a guide for visiting dignitaries. (185) On two occasions, Yount suggested a plan which called for the creation of a police force to provide game protection within Yellowstone. His recommendations went unheeded for a number of years.

Norris slightly revised the set of regulations which Langford had prepared. This set of rules was approved by the Secretary on May 4, 1881, and it remained in force throughout the remainder of the early civilian administration of the Park. (184)

Considering the means at Norris' hands for park protection, he did a reasonably good job. Despite his efforts, the Department of the Interior was under fire for the mismanagement of
During 1882, legislation was proposed which called for the intervention of the War Department in park protection. This proposal failed, but Secretary Kirkwood, who had replaced Secretary Schurz, fired Norris in an effort to better the image of the Department. (184)

On April 1, 1882, Patrick H. Conger was appointed to replace Norris. This was clearly a political appointment. Henneberger has described Conger's administration in the following terms.

Patrick H. Conger was not an able man, and his administration was weak and vacillating in practically all respects. The political conditions under which he worked were bad and perhaps no man could have performed a creditable job. (185)

Despite the shortcomings of Conger's administration, an extremely important piece of legislation was passed while he was Superintendent.

The appropriation item on Yellowstone in the sundry civil bill for the fiscal year 1884 (starting July 1, 1883 to June 30, 1884) was subject to keen controversy in the House and Senate. The controversy dealt with the administration of the park, particularly the subject of leases and the question of protection. When the bill was passed by both bodies on March 1, it gave the park $40,000 and provided a protection force. The police force proposals of Norris and Yount were adopted by authorizing the hiring of ten assistant superintendents at $900 a year for each man. All assistants would be required to reside continuously in the park. Another provision provided for the use of Army troops to protect the park. (184)

This last mentioned provision was to be used by the Secretary of the Interior on an emergency basis. Hampton goes on to further explain the particulars of this bill:

Congress stipulated that $29,000 of the $40,000 appropriation would be expended, under the supervision and
direction of an engineer officer detailed by the Secretary of War, in the construction and improvement of roads and bridges within the Park. Accordingly, on July 6, 1883, 1st Lieutenant Dan C. Kingman, Corps of Engineers, was ordered to Yellowstone National Park.

This legislation was critical because it opened the door for future involvement of the military in the administration and protection of the nation's national parks.

Shortly after the passage of this civil sundry bill, the legislature of the Territory of Wyoming passed a law which brought about 98 percent of the park under the jurisdiction of Territorial laws and authorized the appointment of two Justices of the Peace and two Constables to assist the United States Government in its efforts to protect Yellowstone.

Unfortunately, the Assistant Superintendents, who were hired by Conger, were ineffective in their enforcement of park regulations, and were accused, by park visitors, of selling the very geologic specimens that they were hired to protect from vandalism (185). These fraudulent activities and the resulting lack of resource protection were used as the excuses for Conger's removal in 1884; the real reason being political (184).

On August 5, 1884, Robert E. Carpenter was appointed to replace Conger. Carpenter lasted only one year because it was discovered that he had become involved in a scheme to grant large tracts of the park to private developers. The arrival of the Cleveland administration, in 1885, brought a change in the Secretary of the Interior and the appointment of yet another Superintendent at Yellowstone. The new man was Colonel D. W. Wear.
He assumed the position on June 20, 1885.

Colonel Wear immediately started to replace the corrupt Assistant Superintendents with men who could handle the job. However, disagreements over the administration on the Park surfaced during debate on the appropriation bill for the fiscal year beginning on July 1, 1886. The result of the debates was no authorization of funding for the Assistant Superintendents. This forced the Secretary of the Interior to call the attention of the Secretary of War to the provisions of the bill passed on March 3, 1883, which stipulated that the War Department could be called upon for assistance in protecting the Park. (184)

Hampton describes the transition from civilian control over the park to military control in the following fashion:

Secretary Lamar's letter was referred by the Secretary of War to Lieutenant General P. H. Sheridan, who recommended the "Troop "M", 1st United States Cavalry, Captain Moses Harris commanding station Fort Custer, M.T. - be ordered ... to perform duties in the Yellowstone National Park that recently devolved upon the Superintendent of the Park and his assistants." Accordingly, Captain Harris and his troop were ordered to proceed to the Park, there to take station and report to the Secretary of the Interior. On August 20, 1886, Captain Moses Harris relieved Superintendent Wear of his duties and the era of civilian park administration came to an end. (184)

In summary, the first fourteen years of natural resources management in Yellowstone National Park focused exclusively on the establishment and enforcement of park regulations. Unfortunately, this approach was only minimally effective. Henneberger has provided some interesting insight into the context of resource protection during this era. He states that "the national park concept was an advanced one for America that had not quite seen
the passing of the frontier" (185). He also points out the following:

Restrictions of the type necessary to preserve natural features and wildlife were difficult to place upon an American public accustomed to unbirdled utilization of the nation's resources. Only the military had a system that could enforce the rules and regulations laid down by the Secretary of the Interior to carry out the provisions of the Yellowstone Act. This system was extended to the California parks - Yosemite, Sequoia, and General Grant National Parks in 1890.

It is to the credit of the U. S. Army that they viewed their assignments as temporary, and while protecting the parks, laid the groundwork for the eventual return of civilian protection. (185)

Yellowstone certainly was not alone in its fight for adequate resource protection. Yosemite, Sequoia, and General Grant National Parks were the target of extensive exploitation as well (184).

Military Intervention

Shortly after the arrival of the U. S. Cavalry at Yellowstone, a camp was established at Mammoth Hot Springs and Captain Harris issued the following regulations:

I.

(1) The cutting of green timber, or the removal or displacement of any mineral deposits or natural curiosities, is forbidden.

(2) Hunting or trapping and the discharge of firearms within the limits of the Park is prohibited. Fishing is forbidden except with hook and line, and the sale of fish so taken is also disallowed.

(3) Wagon tires on all wagons used for freighting purposes on roads ... are required to be at least four inches in width.

(4) Camping parties will only build fires when actually necessary.

(5) The sale of intoxicating liquors, except by hotel proprietors to their guests, for their own
use, is strictly prohibited.

(6) Tresspassers within the Park for illicit purposes, or persons wantonly violating the foregoing rules, will be summarily removed from the Park.

(7) No stock will be allowed to run loose in the vicinity of the various points of interest within the Park frequented by visitors.

(8) No rocks, sticks, or other obstructions must be thrown into any of the springs or geysers within the Park.

II. All loose stock found in the vicinity ... will be driven into corral ... and held until proper guaranty is given that they will not again be turned loose. (184)

These regulations became the foundation for future policies of the Park for many years to come, and, in fact, many of Harris's decisions and proclamations, during his tenure as commander of the Park, laid the groundwork for various aspects of NPS policy. On one instance Harris stated:

It is not policy of the government to endeavor to make this Park attractive, by making a collection of domesticated animals, but rather to preserve the reservation in its natural condition and to protect the existing game animals so that they may breed in security. (184)

This statement was made in response to a request that buffalo be placed in the park. On another occasion, Harris refused to give permission to the hotels within the park to bring animals which had been killed outside of the Park in for use in those hotels. The result was a reduction of poaching in the park and protection of animals in the herds surrounding the Park.

On June 2, 1889, Captain F. A. Boutelle relieved Captain Harris of his command at Yellowstone. Hampton indicates that Boutelle immediately became involved in a disagreement with the Secretary of the Interior when he requested funds with which to
purchase fire fighting equipment. The Secretary failed to respond to his request; thoroughly disturbing the Captain. This incident would eventually contribute to Captain Boutelle's removal.

Boutelle apparently was very effective despite his disagreement with the Secretary. He enforced the regulations of the Park strictly and had a profound influence on the development of fisheries policies of the NPS.

When the Acting Superintendent discovered that the fish of Yellowstone Lake were infected with parasitic worms, he notified the United States Fish Commissioner and requested information concerning a remedy. The remedy came eventually from Boutelle himself, who suggested that the barren streams of the Park be stocked with healthy trout as a replacement for the infected fish; on September 25, 1889, he reported 'young trout all planted in perfect order.' Subsequent stocking of the Park's waters was carried on by the United States Fish Commission under the direction of Boutelle's successors and the Yellowstone National Park ultimately became known as a Mecca for trout fishermen. (184)

Hampton also indicates that Boutelle's troops spent much of their time fighting fires during the summers of 1889 and 1890. As a result, Boutelle restricted all campers to designated camping sites; a practice which continues today in many of the parks.

Captain Boutelle was relieved of his command on February 15, 1891 by Captain George S. Anderson and Troop "I". Anderson worked diligently in attempting to resolve the resource protection problems of the Park. By 1894, he and his staff, along with the aid of arrested violators, removed all graffiti from the geyser formations (184). Although not technically legal, Anderson regularly arrested poachers, incarcerated them for a
month or so in the guard house of Fort Yellowstone, and confiscated their equipment. Apparently this tactic was quite successful in reducing the amount of poaching going on in the Park.

(184)

Several other activities of Anderson had direct influences on the management of park resources. Anderson continued the fish stocking program of his predecessor, prohibited fishing in newly stocked waters for two years, decided that fishing season limits were unnecessary, and began live trapping animals which were sent to zoos throughout the country, including the Smithsonian Institution's National Zoo.

Supervision of Yellowstone National Park continued in the hands of the War Department until June 28, 1919 when Horace Albright resumed civilian administration (185,288). Yellowstone was not the only park to receive protection from the military however. Yosemite, Sequoia, and General Grant National Parks all had details of troops between 1891 and 1914. Many of the activities of these troops were similar to those at Yellowstone. For many years, however, no troops were in these parks during the winter months, the thought being that the heavy winter snows provided adequate resource protection. (184)

The most serious resource protection problem these troops faced was that of the trespass of cattle and sheep. Much of their time was spent running herds out of the parks. Rumors of the magnitude of the trespass grazing problem eventually reached the Secretary of the Interior, who dispatched J. W. Zevely, of the
General Land Office, to investigate the problem. Zevely recom-
mended that a group of men be appointed to patrol the parks to
eject the trespassers. Zevely was appointed as Acting Super-
intendent of all three parks and was authorized to hire local
individuals to assist him. This core of individuals served as
guides for the troops stationed in the park and later formed the
park's ranger force. (185)

Henneberger reports that the troops and the rangers had
the following duties:

The orders were to break the camps of sheepherders,
scatter the sheep, kill the goats and dogs, take off the
sheep bells, and bring the sheepmen in for several days;
then turn them loose at some remote part of the park.
If fires were seen on patrol, they were to be put out.

In addition to these regular duties, the rangers
helped with fish plantings and enforced local fishing
regulations. They were appointed State Deputy Fish Com-
missioners in 1903. (185)

Hampton located some interesting facts about fish management in
the California parks:

Finding the streams and lakes of the Parks as lacking
in fish as the forests had been of game, the military
superintendents immediately took steps to rectify the
situation. Receiving no reply from the United States
Fish Commission to a request for young trout to stock
the barren park waters, the Acting Superintendents
turned to sportsmen's clubs and the State of California
for assistance. During the second year of the military
administration some 55,000 trout were planted in the
streams of the Yosemite and Sequoia Parks, and with
yearly additions, the streams were soon "teeming with
fish." One military commander was able to state that
"the parks are becoming probably the finest fishing
grounds in the world." (184)

Military presence in the California parks was not, how-
ever, legal. The Act of March 3, 1883 had authorized military
intervention in Yellowstone National Park only. Language was
finally included in the sundry civil bill of June 6, 1900 which
gave the Secretary of the Interior the authority to call upon the
military for protection of the California parks. In 1914, the
military was replaced by civilian rangers in Yosemite and Sequoia
National Parks. As was mentioned previously, civilian administra­
tion of Yellowstone came in 1919.

Hampton summarizes the vital role of the military in the
preservation of natural resources in the following terms:

One of the larger legacies resulting from the military
administration is the fact that National Parks are
game refuges. In Yellowstone, the administrators could
have easily and naturally provided protection for the
thermal features only; in the California Parks, the
major administrative problems would have been eliminated
had protection been confined only to the big trees and
Yosemite Valley. Fortunately, the early policy makers
looked beyond the obvious and extended protection to
include most life within the parks. One beneficent re­
sult of this policy was the preservation and restoration
of the American bison, an animal that was rapidly near­
ing extinction in the 1890’s. (184)

The Bison of Yellowstone

In 1889 it was estimated by Hornaday that there were 541
buffalo in the United States. Most of these were believed to be
in Yellowstone National Park. (184,160) By 1894 the only wild
bison in the country were believed to be in Yellowstone. By
1900, the size of the Yellowstone herd had dwindled to fifty
animals and, by 1902, the number had dropped to 25 (184,160).

Cahalane has provided an outstanding summary of the
early activities to rescue the American bison from extinction:

The first attempt to preserve the bison under federal
auspices was begun at this time (1902). With a Congres­sional appropriation of $15,000, 18 cows were purchased
from the Pablo Allard herd in Montana and 3 bulls from
the Goodnight herd in Texas. These animals were shipped to Yellowstone National Park and placed in an enclosure one mile south of Fort Yellowstone (now Mammoth). The band was later increased by the addition of four calves captured from the wild herd in the park.

In 1907, the animals and their progeny were moved to a more favorable site in the Lamar Valley. There the famous 'Buffalo Ranch' was constructed. Corrals, traps, chutes, pastures, shelter sheds, barns and other buildings for the handling of animals and shelter of food, equipment and keepers were built.

Since the objective was to produce as many buffaloes as possible, all the stock growing measures were employed. Bulls were segregated in individual corrals except at breeding periods. Cows were moved from pasture to pasture with the seasons. Calves were taken from their mothers and weaned. By 1917, the numbers of males had so increased that the practice of castrating surplus bull calves was adopted.

Feeding of hay to the fenced herd was an absolute necessity throughout the winter months. As the herd increased, and the pastures became more worn, it was necessary to supply feed for most of the year. Since hay was scarce, and expensive in the general region, a large area on the floor of the Lamar Valley had to be cleared of willows, cottonwoods, sagebrush and other growth, and plowed and seeded to grasses. To supply the water necessary to grow good hay crops in that somewhat arid region, an irrigation system was installed. Ultimately, an area of about 600 acres was given over to growing hay for the winter feeding of the buffalo herd and for the park saddle and pack stock that was headquartered at the Ranch.

By 1915, the herd had attained such size that it was no longer possible or necessary to keep the animals under fence during the summer season. In a short time after abandonment of the fenced pastures, most of the animals developed a pronounced tendency during summer to move into the higher mountains along the headwaters of the Lamar River. For a number of years, range riders were detailed periodically to round up the various bands and return them to the vicinity of the Buffalo Ranch. Visitors to the park were quick to take advantage of the thrills afforded, and ultimately the 'round up' came to be staged deliberately as an exhibition. Late in the 1920's, when the policy of more natural presentation of wildlife had crystallized, the round ups were dropped. The buffalo then came to the feed grounds whenever they liked. (160)

It is interesting to reflect back on the policy set by
Captain Moses Harris, the first military commander at Yellowstone, concerning the inappropriateness of introducing domestic animals into the Park. Yet, as early as 1893, Captain George Anderson recommended that introduction of domestic buffalo would perhaps assist the quickly diminishing herd. (184)

The account of the buffalo herd recovery will be resumed in a later chapter as it goes well beyond 1916.

The Hetch Hetchy Affair

Wildlife and grazing problems were not the only concerns of the early resource managers. San Francisco needed a water supply and the Hetch Hetchy Valley of Yosemite National Park was looked to as a potential reservoir site. Although Yellowstone and the other California parks had wildlife and other natural resources which were being decimated by park neighbors, visitors, and employees, these assaults would be minimal in the long term in comparison to that made by a special interest group in California.

The Hetch Hetchy Valley became a major concern during the 1890s and early 1900s. The disagreement between preservationists and developers was bitter at this time and the controversy over the Hetch Hetchy Reservoir further polarized this strained relationship.

On December 19, 1913, President Wilson approved the Hetch Hetchy Reservoir project. This approval set a precedent and the door was opened for other invasions into the National Parks. No further account of the Hetch Hetchy Affair is deemed
necessary because several other authors have written about this event at length (187, 181, 190).

Recapitulation

The first 43 years of national park management were shaky at times. Despite the tenuous nature of park management, important strides were made in natural resources management. Significant steps had been taken to reduce destruction of park wildlife and natural features, indiscriminate grazing was curtailed, the first resource managers (game and buffalo keepers) were hired, and the first rangers with resources management responsibilities were hired. Fisheries management came to the forefront in resource concerns, forest fires were fought, and the American Bison was saved from possible extinction.

Unfortunately the legislative aspect of resource protection was not working well during much of this era. Congress repeatedly failed to provide legislative tools for the proper management of Yellowstone National Park; thus, Superintendents were powerless to enforce their own regulations. The fact that the Hetch Hetchy Reservoir was approved also speaks rather dimly of the commitment of Congress to the protection of the parks. There were, however, a few bright spots in the legislative arena.

Early Natural Resource Legislation

It is interesting to note that the two principal pieces of legislation which applied to the protection of park resources
during these early years were both sponsored by Congressman John
F. Lacey, a staunch conservationist from Iowa. His first success,
in terms of the national parks, was the Yellowstone Wildlife
Protection Act which was signed on May 7, 1894. The other
success was the Lacey Act which was signed on May 25, 1900. This
Act provided protection to wildlife populations.

Hampton has given an excellent account of the passage of
the Yellowstone Wildlife Protection Act. The reader should re­
call that, since the appointment of a Superintendent to Yellow­
stone, a steady stream of recommendations for legislation which
would have given that Superintendent the power necessary to
enforce park regulations, had developed.

Edgar Howell, a resident of Cooke City, was arrested
on March 13, 1894, in the Yellowstone Park and charged
with the wanton killing of buffalo. This was considered
by Captain Anderson to be the 'most important arrest and
capture ever made in the Park,' and was replete with all
of the suspense and surprise of a popular novel. (184)

Howell was apparently caught in the process of poaching five buffalo
and was believed to be responsible for killing six others.

Howell was confined in the guard house at Fort
Yellowstone pending instructions from the Secretary of
the Interior; his bedding, tepee, and toboggan were
destroyed, and the scalps of the slaughtered bison were
preserved with the intention of presenting them, mounted,
to several select military and government offi­
cials. Anderson immediately sensed that the event could
be capitalized on and recommended to the Secretary that
it 'be made the occasion for a direct appeal to Congress
for the passage of an act making it an offense ... for
any one to kill, capture, or injure any wild animal in
the Park,' and that the punishment 'should be graded
between a small fine only and a long term imprisonment.'

Two things set the arrest of Howell apart from the
previous arrests of poachers. This was the first time a
poacher had been apprehended in the very act of killing
and skinning game and his guilt undeniably established
by the presence of still warm bodies. Also, by a happy
coincidence, a team of reporters was in the Park, sent by George Bird Grinnell to collect material for *Forest and Stream*. Through the reportorial skill of Emerson Hough and the photographs of F.J. Haynes, the facts of the case were immediately made known to Grinnell, and he, together with influential friends, at once set out for Washington hoping that this flagrant case of bison killing would convince a still skeptical Congress that legislation was necessary to protect the game animals in the Park. In less than two weeks the desired legislation was introduced in the House by Congressman John F. Lacey of Iowa.... Government for the Yellowstone National Park became a reality when President Grover Cleveland signed the Act on May 7, 1894.

In addition to specifying protective measures for birds, fish and other forms of wildlife, the Act called for enforceable regulations which would further the preservation of timber, mineral deposits and other natural curiosities.

The Act of May 7, 1894, is not nearly as well known as the Lacey Act of May 25, 1900. The latter had much more sweeping importance in the management of this nation's wildlife resources and had direct implications on park management in later years.

The Act of 1900 prohibited the importation of certain types of wildlife which were determined to be injurious to agriculture and horticulture. It also prohibited the transport of game and birds taken in violation of state and territorial laws. In 1935 the Act was amended to prohibit the transport of species taken in violation of federal law. This amendment assisted in curbing poaching in the parks and additional amendments provide control over importation of exotic wildlife species.
The Stage is Set

Between 1872 and 1915 the parks, of what was soon to become the National Park System, were subjected to a whole host of threats including poaching of wildlife, theft of geologic and botanical features, trespass grazing, vandalism, reservoir development, and mismanagement by civilian and military authorities. Through all of this confusion, rudimentary natural resources management programs were started and policies were formulated. Many of these early "protective" efforts would be unacceptable by today's standards but, in some instances they were beneficial and they certainly set the stage for future resource protection efforts. Many of these programs, like total fire suppression and quasi domestication of Yellowstone's bison, merely reflected the level of scientific understanding and general natural resource philosophy of that era. Some aspects of this understanding and philosophy would persist for many years, but, they would eventually give way to ecologically sound management strategies.

In addition to setting this groundwork, perhaps the most significant contribution of this time, as it relates to natural resources management in a park setting, was the germination of the idea that parks are something more than natural anomalies. The following excerpt clarifies this point:

The recreational feature of the park's function had not as yet become prominent. The dominant idea in reference to the maintenance of the wilderness of forests, geysers, mountains ... and game ... in as nearly a natural condition ... as possible, with a view of holding the benefit of those who come after us something of
the original 'Wild West.'

The idea of conservation of forest entered so strongly into the question of park functions at this time as to obscure the recreational features. A committee of the House reported in 1886 that in its opinion the only important duty in the park was to protect the forests from fire and axes. Senator Manderson, of Nebraska, stated that even if the park cost a quarter of a million annually it would be money well spent. Not for the purpose of recreation, he hastened to add, "but for the greater and broader purpose of the preservation of these great forests." An agent of the Interior Department declared that the two great objects of Congress in creating the park were preservation of the forests and game. (176)

Was the concept of ecosystem management beginning to develop back in 1886?

Much had been accomplished in the field of natural resources management but, much still needed to be done. The time was ripe for the work of Stephen Mather.
Chapter 3

THE MATHER YEARS

Leadership Sought and Gained

The events leading to the arrival of Stephen Mather on the national park scene have been recounted numerous times. For the sake of continuity, an abbreviated account will be given here. Mather was preceeded as administrator of national park affairs by Adolph Miller, a professor from the University of California. Miller had been brought to Washington, D.C. by Secretary Lane to work on the creation of a National Park Service. In turn, Miller brought Horace Albright, a University of California acquaintance, to the Washington political arena. Shortly thereafter, Miller left the Department of the Interior to join the Treasury Department. Coincidently, Stephen Mather complained to Secretary Lane about the condition of the National Parks. Mather was promptly invited, by Lane, to come to Washington to take Adolph Miller's place.

Mather, of course, was a likely candidate. He was a successful businessman, the former editor of the New York Sun, a member of the Sierra Club, a mountain climber, and a friend and admirer of John Muir. But Mather did not want to be a National Park Director. He had other personal commitments. It took considerable negotiation and pressure politics to get Mather to come in and discuss his complaints with Lane. But he did and Lane introduced him to Horace Albright. Lane left them alone together in a private office with a wood fire to review National Park needs. They soon found an affinity of thoughts and principles which sparked a friendship and led to the great working team which exploded into both national and world conservation history. (182)
Mather's management of the national parks was founded on two intriguing points of personal philosophy. First, Mather sought to maximize the use of personnel in other Federal agencies and deliberately kept the Service small.

The efficiency requirement stemmed from a promise Mather had made all over the country when he was trying to get his bureau. He wanted nothing big, he said, just something neat, compact, and efficient. In this, he was entirely sincere. He drew up an organization chart back then, showing where the future Park Service might turn for specialized help: to the Biological Survey for predatory animal control, to the Public Health Service for sewer and water system planning and construction, to the Bureau of Entomology for insect control, to the Bureau of Fisheries for trout stream restocking, to the Forest Service.... (198)

Second, Mather was extremely reluctant to dispense with wildlife under the jurisdiction of the Service, even though herd reductions would benefit the animal populations.

His love for the birds and beasts was deep and genuine, but it was erudite. He was more conversant with the trees and flowers, yet even in the presence of botany, he showed greater feeling than knowledge. The killing of wild animals, not excluding predators, racked him mightily, and when the presence of the hoof and mouth disease around the Tuolumne watershed in 1924 necessitated the slaughter of some Yosemite deer, his consent came from him with a shudder....

The wildlife responsibility of the Park Service, as Mather started to develop it, was to exhibit native species in their natural environment (hence, the gradual disappearance of zoos and other artificial presentations), letting management definitely intervene but only to the degree necessary to control excess populations.... (198)

Both concepts had direct, long term implications in the agency's management of natural resources.
The Creation of the National Park Service

Mather arrived in Washington in late January 1915 and assumed the duties of an Assistant to the Secretary of the Interior. He promptly began work on legislation which would establish a National Park Service. He also undertook a major publicity program to promote the parks (176). Both efforts were initiated in collaboration with numerous political and civilian leaders. That campaign came to fruition with the passage of the National Park Service Act of August 25, 1916.

Beyond the overriding importance of this piece of legislation in the creation of a unified National Park Service, this act set some very specific policies for the management of the natural resources in the national parks.

The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations....

[The Secretary of the Interior] may also, upon terms and conditions to be fixed by him, sell or dispose of timber in those cases where in his judgement the cutting of such timber is required in order to control the attacks of insects or diseases or otherwise conserve the scenery or the natural or historic objects in any such park, monument, or reservation. He may also provide in his discretion for the destruction of such animals and of such plant life as may be detrimental to the use of any of said parks, monuments, or reservations.... the Secretary of the Interior may, under such rules and regulations and on such terms as he may prescribe, grant the privilege to graze live stock within any national park, monument, or reservation herein referred to when in his judgement such use is not detrimental to the
The first paragraph of the excerpt quoted above is frequently cited as the fundamental purpose of the Service. When used independently, an inappropriate interpretation may be generated. Without the second paragraph cited above, one might be lead to believe that, in 1916, park resources were not to be altered in any way, as is essentially the case today. This was far from the truth. This legislation specifically allows grazing, predator control, forest insect and disease control, and timber removal to enhance visitor use and scenic values.

Pressure on the Parks

Prospects for protection of park resources appeared bright in the fall of 1916. A federal bureau had been established to manage the parks and, shortly thereafter, Mather was named as it's first Director. The system consisted of 17 National Parks and 28 National Monuments. (31) Even prior to the creation of the agency, Mather had launched a "see America first" campaign which effectively resulted in increased visitation and public support of the park idea. In spite of these encouraging circumstances for the parks, the tide of success would begin to go out shortly.

Stress surrounding the creation of the Service came to a head when Mather suffered a nervous breakdown. Fortunately, Horace Albright was able to assume the responsibility of Acting Director. In addition, the United States entered World War I in April of 1917. The nation's participation in the war effort
immediately brought pressure on the parks to allow utilization of
their resources.

Albright, who was acting director during the Park Service's organizational period, appeared before the House Appropriations Subcommittee on Sundry Civil Appropriations in January 1917, seeking money for the 1917-18 fiscal year.... Twenty seven year old Albright emerged from the hearings with a half million dollars. Indeed, on April 17, shortly after Congress declared war, he secured a deficiency appropriation for operating funds until a new fiscal year began on July 1.... Positions and the men to fill them did not come as easily as dollars. Even if Congress had authorized new positions for the parks, the men required to staff them were committed to Europe.... The military had saved the parks from what might have been serious damage, and it had even undertaken the development of high quality touring roads and public facilities. But Mather and Albright now wanted rangers who could educate and assist as well as police the public. The army obviously wanted out, too. The transfer of the parks to civilian control occurred in every park except Yellowstone, where congressional whim kept troops through the war. But no park had a staff sufficient to provide professional public service and protection that Mather and Albright envisioned.... The greatest threat to the parks during the war was the nation's determined search for food and fuel.... Not surprisingly, Herbert Hoover's Food Administration demanded grazing permits and access to park fish and game. Western cattle and sheep graziers, many of whom had never accepted their loss of access to parkland, joined in the clamor. Western newspapers carped about the foolishness of preserving beauty at the expense of food. Fuel shortages, although less critical than those of food, also brought demands for park minerals and timber. Even Secretary of the Interior Franklin K. Lane, not wanting his department to appear unpatriotic, urged that park resources be made available for the cause.

Mather and Albright resisted those demands with their usual blend of political skill, compromise, and adherence to principle. They granted token grazing permits to park neighbors who did not intend to use the privilege very much. They persuaded Secretary Lane to modify his stand. They directed longtime park supporters (groups like the Sierra Club and the American Civic Association and such individuals as Gilbert H. Grosvenor of the National Geographic Society and E. O. McCormick of the Southern Pacific Railroad) to court unsympathetic congressmen. They made known that western lobbyists
were often less interested in the national need than in recovering their access to the national parks. They even persuaded officials of the Food Administration to acknowledge that fish, game, and pasturage in the parks were not sufficiently abundant to warrant their sacrifice. Despite a few compromises, park resources and the principles undergirding their preservation survived the war intact. (282,49)

**Legislation**

Pressure also came in the form of legislation which appeared beneficial on the surface but established a grave precedent in the management of mineral and wildlife resources in parks. Mt. McKinley (now known as Denali) National Park was authorized on February 26, 1917. That legislation permitted mining on parkland and opened areas within the park to irrigation operations. It also authorized prospectors and miners to hunt in the park. "The reasons advanced for the creation of the park were (1) stimulation of travel to Alaska, (2) preservation of the natural scenery, and (3) protection of wildlife" (187). Minerals, water and wildlife must not have been considered critical to the "natural scene."

Prospectors and miners were at first allowed to kill as much game and birds as was needed for their actual necessities when short of food. In no case though could game or birds be killed for sale or removal from the park. This section of the enabling legislation proved to be quite a problem to the rangers. With miners freely moving in and out of the park and allowed to kill game for use in the park, it was very difficult to control poaching. The food markets in the surrounding mining towns were a profitable money source to miners eking out an existence while trying to strike it rich. The rangers made some captures with a few successful prosecutions, but not enough to completely stamp out the poaching. (185)

Despite recognition of the flaws in the legislation which
established Yellowstone National Park, the legislative branch continued to write and enact laws which inadequately protected park resources as illustrated by the Mt. McKinley Act.

Organization and Programs

The First Resource Management Staff

Stephen Mather moved quickly in the organization of the Service. Many of the park Superintendents, who were political appointees, were replaced (198). As was discussed previously, military control of the parks was ended, and a Washington Office organization began to emerge. Horace Albright was sent to Yellowstone in 1919 and Arno Cammerer was hired as the Assistant Director (288,187). Mather believed that the Service could best function if the individual parks were allowed to operate with a minimal amount of influence from Washington (a feeling which still prevails). Thus the Service's headquarters staff was kept to a minimum. (198)

One of the three original divisions established in the Washington Office was that of landscape engineering (architecture) (50). Shankland has described this division as follows:

The landscape architecture division was important and unique. Mark Daniels, a landscape 'engineer', as he called himself, had played with the idea of setting up something like it, but as it has developed, it was conceived by Cammerer in conversation with Mather in the summer of 1918, before Cammerer joined the Service.... The need for knowledgeable landscape architecture stemmed from the old paradoxical need for mixing preservation with use. The function of the division would be advisory: it would indicate methods of carrying out the construction of buildings, camps, villages, and highways with a minimum sacrifice of natural scenery. After the engineers had delivered a set of plans, the landscape
architects would study them in the interest of the verdure, showing how it might be saved and, in places where it could not be saved, how scars might be erased. They would advise on all scenery questions - for instance, vista clearing: the opening of a meadow, lake, or waterfall just enough for it to be seen and appreciated but no more... The landscape work had Mather's full enthusiasm....

As in other divisions of the Service, the landscape architects occasionally have got outside assistance. (196)

In 1925, Mather expanded his Washington Office by creating an Educational Division. This division had been preceded for a brief period by a similar group under the leadership of Sterling Yard. In 1918, a National Park Educational Committee was created and in 1919 that Committee evolved into the National Parks Association (now known as the National Parks and Conservation Association). Yard left the Service to work as the director of this Association. The newly created Educational Division was placed under the direction of Ansel Hall and was based in Berkeley, California. (4)

In 1926, several devastating fires occurred in a number of the national parks. This stimulated Mather to designate Ansel Hall as the Service's Chief Forester. In 1927, a separate Division of Forestry was established. (95,6) Like the Educational Division, The Forestry Division was located on the Berkeley campus of the University of California. On July 16, 1928, John D. Coffman joined Ansel Hall on the forestry staff as a Fire Control Expert and the following year the Service sponsored fire control training for the first time (95,6).

In the insect and disease infestation field, the National Park Service had close cooperation with the Bureau of Entomology in the Department of Agriculture.
Field investigations were carried out by Bureau of Entomology experts and control measures planned and supervised by them. Control work was normally performed by park employees. During the late 1910's and early 1920's, rangers handled much of the insect and disease control work. Later, in the mid 1920's, foresters were hired for this work and the rangers were no longer greatly involved in forest control measures. (185)

In keeping with Mather's desire that the size and programmatic involvement of the Service's central office be kept to a minimum, most natural resources management took place on the park level. An examination of those activities at Yellowstone National Park will serve to exemplify what was occurring throughout the system.

Yellowstone's Programs

The restoration of the Yellowstone bison herd has already been discussed at some length. Much of the effort to save the herd took place during Mather's administration.

By 1922, it was obvious that the buffalo population would soon become too great for the winter range. Some natural losses had occurred, of course, due to weather and old age. Outbreaks of hemorrhagic septicemia were responsible for losses of buffaloes on three occasions: in 1911, 22 animals; 1919, at least 36 animals; and in 1922, 52 buffaloes died. Bang's disease also reduced the calf crop at one period. Grizzlies, and perhaps black bears, may have killed a few calves. The two other possible predators, wolves and cougars, were greatly reduced in numbers early in this century and were finally exterminated from the park about 1922 and 1925 respectively. The losses of buffalo were comparatively slight. There are now (1922) 578 on the Lamar Ranch.

Legislation permitting disposal of the surplus buffalo was enacted in 1923. Slaughter of excess animals has been a fairly regular procedure since 1925. A total of 2,625 buffaloes have been removed from the Lamar herd in the years 1908 - 1944. Of these, 691 were shipped alive to zoos, parks, Indian reservations and other ranges; 71 were moved in 1936 to other parts of Yellowstone Park itself; and 1,863 were slaughtered and mostly donated or sold at cost to Indian tribes. Nevertheless
the number of buffaloes increased to over 1,000 at times. (160)

This description goes somewhat beyond the Mather administration but gives the reader a general idea of how the bison were management in the 1920s. These same management techniques were employed at Wind Cave and Sully's Hill during this same period.

Perhaps the best known wildlife management issue of the first two decades of this century is predator control. Once again Victor Cahalane has provided an outstanding summary of the development of predator control activities in the national parks with emphasis on events at Yellowstone.

The history of predator control in the parks holds much of value for the ecologist, who is interested in the evolution of opinion on animal relationships. Whether based on research or current belief, predator management has been greatly influenced by superficial observation, personal bias, exigencies of the occasion, and group pressures. Control methods have varied, tending of late decades toward those of greater selectivity. Even the species included in official lists of predators have varied. Numerous at first, these became fewer with the passing years particularly by exclusion of smaller carnivores....

For the first six years of Yellowstone's existence, the failure of Congress to appropriate funds for administration prevented the Superintendent, N. P. Langford, from living in the area or doing anything for its maintenance....

In 1878, however, an appropriation for administration was made and P. W. Norris went to Yellowstone as resident Superintendent. Like all frontiersmen and wilderness sojourners of their day, the early superintendents exercised sporadic and haphazard control of wolves, cougars, and other carnivores. Self protection and guarding of personal possessions, and food supplies, had been the original objective. Occasionally a predator was shot to prevent it from killing game, the actuating motive being to save the future food 'on the hoof' or to prevent the 'cruelty' attributed by the human mind to destruction of prey by the predator....

Protection of the ungulates rapidly became of greater importance as a motive for predator control.
Under better protection from poachers, the 'game' increased and in spite of 'control,' the carnivores followed suit. By 1889, Acting Superintendent F. A. Boutelle, Captain, First U.S. Cavalry, recorded his belief that something should be done to exterminate them. The next year, he was more that ever convinced that the bear and cougar were doing a great deal of mischief and should be reduced in numbers. In the park report for 1897 appeared the first observation of the detrimental effect of coyotes on antelopes. Almost without interruption down to very recent years, the successive administrative officers of this park have reiterated the belief that coyote control must be continued in order to save the antelope from extinction. Other 'game' species, too, were objects of solicitous concern.

Reduction of the number of species classified as destructive predators evidently lasted until the close of administration of the parks by the Army. In 1916, the National Park Service was established and took charge. Immediately, the reports began to express great concern for the safety of the grazing and browsing mammals. Predator control was practiced with thoroughness, and the list of undesirable species increased to include not only the cougar, wolf, and coyote, but also lynx, bobcat, red, gray and swift foxes, badger, mink, weasel, fisher, otter, and marten. Even pelicans were reduced in numbers in Yellowstone on the grounds of trout protection. All of these species were hunted for almost a decade, the intensity of the campaigns being determined largely by the individual park superintendents. At the Superintendent's Conference in 1925, the marten was definitely eliminated from the proscribed list. Director Mather at the same time stated his opinion that the 'black list' should be reduced to include only the wolf, coyote, and mountain lion. Except in isolated instances, destruction of the smaller carnivores ceased at that time and campaigns against the other species became less intense or were discontinued in most of the parks.

The value or necessity of killing off the predators was rarely questioned during the early history of Yellowstone administration. In 1887 and 1888, however, Captain Moses Harris of the First Cavalry, who was acting as superintendent, apparently observed to the letter the legislation giving protection to all wildlife. In his report for '87, seemingly in answer to criticism of his protection policy, he said: 'I have heard considerable anxiety expressed by those who profess interest in the Park lest the rule which protects equally all animals in the Park should work to the detriment of the game proper by causing an undue increase in the carnivora. But while it is true that
there are some noxious animals that are not worthy of protection, chief among which is the skunk or polecat (!), yet I am convinced that at the present time more injury would result to the game from the use of firearms or traps in the Park than from any ravages which may be feared from carnivorous animals.' The following year Captain Harris again referred to the fears of those who felt the game animals might be exterminated 'as without present foundation'.

In general, the attitude that predators could do no good determined the administration of control operations in Yellowstone for the next two decades.

In his report for the year ending June 30, 1918, Director Mather recorded that a cooperative plan had been worked out with the Chief of the Biological Survey, under which an intensive campaign for the destruction of predatory animals in Glacier National Park was in progress, under the joint direction of the park superintendent and an expert of the Survey. At the same time, the latter bureau detailed another hunter to trap and hunt wolves and coyotes along the northern boundary of Yellowstone. At various times, other government hunters working under the direction to the Biological Survey carried on predator control in Rocky Mountain, Grand Canyon, Wind Cave, Mesa Verde, Mount Rainier, and Zion National Parks. This cooperative relationship between the two bureaus continued for a number of years until changing sentiment of the late 1920's fostered a policy more favorable to the carnivora. (256)

The following letter sent from Charles Kraebel, Superintendent of Glacier National Park, provides some interesting information about predator control procedures:

"October 15, 1926

"The Director
"National Park Service
"Washington, D. C.

"Dear Sir:

"There is attached hereto a copy of a letter from Chief Ranger Carter regarding the hunting of coyotes by Park Rangers and other employees of Glacier National Park.

"Before setting down a rule for this work in Glacier Park, I am anxious to know whether the Service has a definite policy regarding it. It is my understanding that in Yellowstone Park the rangers are required to turn all hides over to the Government and that such hides are then sold by the Superintendent.
Ammunition used for such hunting, I understand, is furnished by the Government.

"Last winter, I required each ranger who hunted coyotes to turn every fifth hide over to the Park and since only one hide was obtained in this manner for the Park, it was kept for museum purposes.

"In my opinion, while there is some weight to Mr. Carter's idea of the coyote privilege being an incentive to the rangers I should be reluctant to see the privilege made absolute so that the Park itself would secure none of the hides taken.

"Owing to the comparative rareness of lynx and cougar in Glacier National Park, I do not believe that these animals should be hunted at present. With the assistance given to deer and elk through our winter feeding, I believe the population of these animals in the Park can easily stand the toll taken by a limited number of lynx and cougar.

"Hunting predatory animals except coyotes was discussed at the last Superintendent's conference and it will be remembered that Naturalists as well as most of the Superintendents were of the opinion that extermination of such animals was not desirable and that their presence in the Parks is as much a part of the natural conditions as the presence of other wild animals. At present, I am convinced that there are more than enough lynx and cougar in Glacier National Park to maintain a biological balance.

"Your advice on these points will be appreciated.

"Sincerely yours,

"Chas. J. Kraebel,
"Superintendent." (126)

Protection of ungulates through predator control was not the only ungulate management strategy utilized. Efforts even extended to the development of a cooperative effort between the Service and the Benevolent and Protective Order of Elks. Apparently the elk of Yellowstone were being poached because their teeth were held sacred by members of the Order. Mather and Albright were successful in having the Order declare that the teeth were of no official status, thus reducing the incentive to poach. (288)
It was also during the Mather administration that overabundance of ungulates was first noted. As mentioned previously, this situation was aggravated by the control of predatory animals. The problem of increasing populations was compounded by the shrinkage of winter range caused by development and fencing around the parks. The severity of the problem is illustrated by the fact that Yellowstone elk were fed 1400 tons of hay during the winter of 1919-1920. (288) It is interesting to note that both public funds and donations were used to pay for the supplemental feeding. (200) Despite this effort, 5,000 - 6,000 head died. (288)

A cycle of over protection of ungulates and supplemental feeding would leave its mark on park wildlife for many years to come.

Another sidelight, which is indicative of wildlife management philosophies, is recounted in Swain's book on Horace Albright.

Albright had his own ideas about how and why wildlife should be managed. He believed that wild animals constituted one of the greatest attractions of the park and that visitors to Yellowstone had a right to see wildlife whenever possible. He expanded the so-called Buffalo Corral at Mammoth Springs, where buffaloes, and at various times (never very long), deer, elk, coyotes, bears, porcupines, and badgers were kept in cages 'for the close inspection of tourists' so that 'those interested in the park's rich wildlife may make close-up studies and photographs of the mammals of the region.' Albright believed that the educational and entertainment value of the Buffalo Corral far outweighed its disadvantages. Later in the 1920s, he expanded the bear pits near the park's hotels, where every evening the bears gorged themselves on food scraps and garbage from the hotel dining rooms. 'The feeding grounds at Old Faithful, Lake, and Canyon are one of the feature attractions at these points,' he claimed in 1927.
Seating accommodations have been provided ... and ranger lectures on the bears and other wild animals of the park are delivered at 7:30 P.M. daily. These talks have been largely attended and many favorable comments have been brought to the attention of this office. The fact that bears groveling in garbage and buffaloes living in enclosures were not really 'wild' life did not particularly trouble Albright....

Albright's affection for the impish and comical Yellowstone bears became almost legendary. In his idle moments, the hardworking park superintendent often entertained himself by watching the antics of 'Mrs. Murphy,' or some other talented 'Beggar Bear,' followed by a couple of gamboling cubs. 'hold up' a string of cars and win a bountiful handout. His monthly reports to Mather contained numerous bear stories, as when an unfortunate cub, evidently in quest of honey, got his head stuck in a hollow tree and had to be sawed free by two compassionate rangers. (200)

Next to the geysers, the bears gave park visitors the most pleasure and they still do. From the time tourist facilities were put into operation back in 1883, and perhaps earlier, garbage from the hotels and camps was deposited about a mile from the kitchens. Thousands of people visited these piles to watch the antics of the black bears, coyotes, gulls, and as twilight faded into darkness, grizzly bears. Near Old Faithful geyser, in the Upper Geyser Basin, and at Yellowstone Canyon, I had 'Creek Theaters' built of logs, and there hundreds of park visitors went to watch the animals. A mounted ranger with a rifle at the ready, was stationed between the seated visitors and the bears, to protect both. (288)

Finally, it has been noted that 2,000,000 trout and grayling fry were planted in the waters of Yellowstone National Park during 1920. (177) Fish stocking in western parks was rapidly reaching a zenith.

A comprehensive fish map of Yellowstone National Park, probably the first of its kind, was prepared under the personal direction of Dr. Hugh M. Smith, the United States Commissioner of Fisheries, and shows all of the fishing streams of the park and the species of the fish to be caught. (51)

Although a good deal of emphasis has been placed on wildlife management, programs were also instituted in other
resource management fields at Yellowstone. The tradition of fire control, started by the military, continued under civil administration. In 1919, during the Mountain Ash Creek fire, the park fire crew was without supplies. To fill the void, they commandeered the supplies of a party which was travelling through the park. Among that party was Walter Fisher, a former Secretary of the Interior. (288) Forest fire suppression ranked second only to predator control in the amount of time and energy expended by early rangers in their efforts to "protect" the natural resources of the parks. Despite the emphasis placed on fire fighting, the lack of funds for the activity was a nagging problem. In 1920 alone, Mather requested an appropriation of $100,000 but received only $25,000 for fire emergencies. (177)

By today's standards, the elimination of naturally occurring wildfire and predators in the parks is unacceptable. The Service would learn from these mistakes before Mather left his appointment.

Yellowstone was also apparently one of the first parks to be involved in weather monitoring and stream gaging.

Winters are cold in the Yellowstone country. The rangers had to constantly contend with below zero temperatures and high winds. Ranger Frank Anderson was at Yellowstone the winter a record low temperature was recorded.

"It was the winter before, '32 - '33, that Al Bicknell and I set a new U. S. minimum. It was my birthday so I'll never forget it. The evening before we had commented to the Rundells, winter keepers who boarded us that winter, that the chances were good that we would set a new minimum for Yellowstone. The Buffalo Ranch at minus 59 (I believe) had held the Yellowstone record for some time. When we arose the next morning Al checked the weather station first and called me outside. The indicator had descended into the bulb and had hit
The minimum thermometer was calibrated to only 65 and the top of the needle was at least a degree distance from the 65 mark the morning of February 9, 1933. It was only after our records were transmitted to the Weather Bureau and they requested that our thermometer be sent in for checking that we learned that the 66 was a new U.S. record."

In 1913 in Yellowstone, gaging stations had been established on the Yellowstone, Madison and Snake Rivers to record stream level and flow data for use by the U.S. Geological Survey Water Resources Branch and Bureau of Reclamation in their Missouri River Basin dam investigations. Army troops and scouts assisted the USGS personnel in reading and maintaining these stations. Later, rangers took over this activity. Gaging stations not accessible by car or horse during the winter were at first read only during the summer. In the late 1920s, rangers were instructed to read all stations while on regular winter patrol. (185)

Other Activities

An examination of the proceedings from the 8th Annual Superintendents Conference, held in 1925, provides some interesting insight into the resources management concerns of that decade. Mosquito control efforts were discussed at length. Apparently waste oil from crank cases was a highly successful control technology employed at Yellowstone. (172)

As might be expected, predator control was also a popular topic at the conference. This issue has already been explored. Other wildlife problems discussed included an epidemic of hoof and mouth disease in the deer population in and around Yosemite and the use of artificial enclosures to keep animals for visitor enjoyment. (172, 53)

The following quotes from the "Director's Annual Reports" of 1920, 1924, and 1929 reveal the diversity of resource concerns even at these early dates.
In the Grand Canyon a serious problem has developed through the extraordinary increase in the number of the so-called wild burro. This burro is not indigenous, but descended from native stock left decades past. These animals living down in the canyon have increased to such an extent that they form a veritable pest, denuding the plateaus of grass and other forage so that native wild game such as antelope has been forced out; it is even necessary for working and exploring parties to pack feed for their working animals. Furthermore they destroy the trails. Altogether the time is not far distant when radical steps will have to be taken to eliminate the burro evil. (51)

Another measure of forest protection which should be inaugurated at the earliest practicable date is that of cleaning up the dead and down timber and improving roadside conditions in the parks. Not only would the beauty of the woods and the scenery be enormously improved, but from a practical standpoint the cost of removing these serious fire hazard conditions from the invaluable park forests would be justified. (52)

In order that visitors unable, through lack of time or physical strength, to visit all parts of the park may see and enjoy as many varieties as possible of the exquisite wild flowers that abound in out of the way places, wild flower gardens have been constructed in several of the national parks. One such garden established during the past summer is at Giant Forest in Sequoia Park.... Other gardens have been established in Yosemite and Crater Lake National Parks. (54)

John Henneberger has traced the establishment of two other natural resources management activities which would become hallmarks in the field. The first was snow surveys in the High Sierra parks and the second was timber management.

[A] long time career man who started in Yosemite was Edward D. Freeland who served in seven national parks over a 38 year period. He was one of the first group of five Yosemite rangers to make a snow survey to the Yosemite High Sierra in winter to measure snow depths and moisture content for use by the California State Water Resources Board in predicting spring water run off to the irrigation areas of the San Joaquin Valley west of the park. The first trip was made in the late 1920's on snowshoes with the rangers carrying all their food and equipment; sufficient for a week long, 120 mile trip. Overnight cabins were later built along the route
and stocked with food. Snowshoes gradually gave way to skis as skiing became popular on the West Coast and the rangers learned to ski. These snow surveys have continued to the present though they are not as rugged as the first years for over the snow mechanical equipment is used on most of the surveys to carry the rangers from snow measuring course to snow course. Almost all the Yosemite rangers who worked there up to 1955 remember the long trips, made once a month between January and April, either as enjoyable experiences when the weather was good, or tough excursions when caught in a High Sierra blizzard while on the survey. (185)

A new aspect of park protection was emerging at this time that brought the forester into park protection work. This pertained to timber and land exchanges, insect control work, and tree disease control. In Yosemite, there were many private holdings that contain some of the finest stands of sugar pine in the High Sierra. Soon after 1900 they were threatened for destruction by the logging companies who owned them. Three bills were passed by Congress in 1919 and 1914 to effect [ex]changes of privately owned timberlands in the park for: (1) timberlands of equal value outside the park; (2) of timberlands along the roads in the park for timber elsewhere in the park; (3) or for Stanislaus and Sierra National Forest lands. To work out these exchanges, Elbert C. Solinsky, a local timber cruiser and land locator, was appointed as a special ranger in 1915. He was promoted to forester in 1917. He took a prominent part in dealing with the Yosemite Lumber Company in the exchange of 6,000 acres of timber along the Wawona Road for lands outside the park. These exchanges continued through 1923.

Tree disease control work started in Yosemite around 1915 as a result of blister rust outbreaks killing five needle pines in the park. Since this was an exotic disease that came into the United States at the beginning of the century, the Interior Department decided control measures were needed to save the sugar pine from destruction.

The first rangers in Yosemite to work on insect and disease control were Charles Adair, Henry Skelton and Arthur Callison. (185)

The effort to save timber in California was not limited to Yosemite National Park. Horace Albright has given a detailed account of numerous efforts to "save the big trees" throughout the state in an article which appeared in the Saturday Evening
Forest insect and disease problems also were not limited to Yosemite. The 1924 "Director's Annual Report" discusses outbreaks of spruce budworm and lodgepole sawfly in Yellowstone and Crater Lake. "Our experiences indicate that insect infestations are far more destructive that the fires we have to combat and therefore should be fought as strenuously as any fire."

Park fire schools were conducted in several parks by Coffman, starting in 1929. At these schools, rangers obtained valuable fire fighting training. In addition they attended fire schools at nearby national forest training centers that were being conducted by the Forest Service. The first of the park fire schools were arranged by Coffman in the spring and early summer in the parks having the greatest forest and brush fire danger... Glacier, Yosemite, Sequoia, Lassen and Crater Lake.... Three days were taken for such schools. There were indoor discussions and outdoor construction of fire lines on dummy fires with actual practice in the use of fire equipment, including the operation of portable pumps....

... The 1920's saw many large fires break out in the west.

Several of the worst occurred in Glacier National Park. In 1926, all activities in Glacier were overshadowed by the imperative need to fight 23 forest fires that broke out that summer and swept over 50,000 acres of park lands.... The total cost to the Federal Government to control the Glacier fires was $203,073.

Personnel were sent from other parks to assist the Glacier fire fighters. This was one of the first instances of rangers and fire guards from one park being used to help out on fires in another park....

A large fire broke out in Sequoia in 1928 which involved the fire fighting organizations of the Forest Service, California State Division of Forestry, and Sequoia National Park.... After the fire, it was thought desirable by the three agencies that a review of the fire suppression activities be held for the purpose of perfecting cooperation on future fires.

The review was held in nearby Fresno under the auspices of the Forest Service Regional Forest Protection Board with Regional Forester S. E. Snow presiding.... Field Director Albright, Superintendent
White, Chief Ranger Cook, Ansel Hall, and John Coffman attended for the National Park Service. The conference reviewed the actions of the fire fighters that led to the misunderstandings. The review brought forth suggestions for improvement in cooperative activities among agency's fire fighters. These suggestions were followed on subsequent fires, leading to more successful fire control. (185)

The Mather Era also saw the construction of several fish hatcheries in some of the national parks (three federal facilities in Yellowstone, one federal facility in Glacier, and one state facility in Rocky Mountain). (177) Thus, the standing tradition of artificial manipulation of the fishery resource in national parks became firmly entrenched.

In 1929 there developed a need for greater information concerning fish [fresh] water resources in the western national parks. Another need was for closer cooperation between the Bureau of Fisheries, who were carrying out fish cultural activities in the parks, and the National Park Service, who were responsible for visitor fishing activity and who assisted the Bureau of Fisheries in planting eggs and fry in park waters. The two Agencies agreed to an arrangement whereby a Bureau of Fisheries research man would be detailed to the National Park Service to study fish cultural needs.

Fred J. Foster, Utah District Supervisor of the Bureau of Fisheries was detailed out of his Salt Lake City office the summer of 1929 on this work. He visited the major western parks surveying park waters, analyzing fish cultural and planting activities...

When District Supervisor Foster was at Yellowstone the summer of 1929, he noted a Ranger McCarty who was taking charge of the distribution of planting stock, securing research data and acting as National Park Service contact man with the Bureau of Fisheries hatchery. Foster recommended similar arrangements for the other national parks where fishing was a major visitor use activity. (185)

Finally, during the early 1920s, Albright requested that the various park staff's conduct spring and fall game counts and that life cycle studies be prepared. (200)
Early Insight

In retrospect, many of the manipulative activities which were imposed on park resources during these early years were scientifically improper but, in their historical context, they represented the state of the art. In this light, it is interesting to note that a petition was published in 1921 by the American Association for the Advancement of Science which called for "absolutely natural" national parks.

The maintenance of the national parks in an absolutely natural condition is of utmost importance for a reason as yet but little understood by the general public, even by those most familiar with parks and most ardent in their defense. This is the opportunity they offer for the study of plants and animals in their natural surroundings. These studies are fascinating in themselves, but besides this they are capable of adding to the sum of scientific knowledge which forms the basis on which rest the practical methods of cultivating crop plants and domestic animals. The national parks are rich fields for the natural sciences included under the term biology, because on them the native fauna and flora may be found more nearly undisturbed than anywhere else. Many interesting plants and animals will survive in the parks long after they have been exterminated over the rest of the country. The opportunity thus afforded for seeing and studying rare forms will not only give pleasure to thousands, but will aid in the solution of difficult scientific problems.

A RESOLUTION BEARING ON THE INTRODUCTION OF NON NATIVE PLANTS AND ANIMALS INTO THE NATIONAL PARKS OF THE UNITED STATES

WHEREAS, one of the primary duties of the National Park Service is to pass on to future generations for scientific study and education natural areas on which native flora and fauna may be found undisturbed by outside agencies;

WHEREAS, the planting of non native trees, shrubs or other plants, the stocking of waters with non native fish or the liberating of game animals not native to the region impairs or destroys the natural conditions and native wilderness of the Parks;
BE IT RESOLVED that the American Association for the Advancement of Science strongly opposes the introduction of non native plants and animals into the National Parks, and all other unessential interference with natural conditions, and urges the National Park Service to prohibit all such introductions and interference. (183)

Land Protection

All parks and monuments which were created up until 1920 had been carved out of the public domain. Land Acquisition for the Service was accomplished through transfer of lands from one agency to another. This precedent was changed somewhat by two acts passed in 1920 and 1925. Essentially these acts allowed the Secretary of the Interior to accept donations of lands, other than those within the public domain, within the boundaries of authorized parks. This was significant because it opened the way for authorization and subsequent acquisition of Great Smoky Mountains, Mammoth Cave and Shenandoah National Parks. (146)

A Vulnerable System

Early in the twenties, the Service demonstrated that it had learned from the mistakes surrounding the Hetch Hetchy Affair and perhaps from the loop holes in the Mt. McKinley enabling legislation. Mather and Albright were successful in fighting off an attempt to establish an irrigation project on the Beckler River of Yellowstone (288). During the course of the confrontation over this issue, Albright and Mather threatened to resign should the project be approved. Fortunately, Secretary Franklin Lane, who strongly supported the project resigned first.
Farmers in Idaho were desperate for water, and the proposed spot in Yellowstone was a natural spot for a dam to be built. The dam would flood a beautiful meadow, but, its backers claimed, that would be only a small intrusion on the park compared to the good it would do elsewhere.

Secretary of the Interior Lane was convinced. Seven years earlier, Lane had approved construction of Hetch Hetchy Dam in Yosemite, despite the strong opposition of John Muir and the Sierra Club. Now he ordered Mather to review the situation and turn in a report favorable to the dam.

Mather refused. Seeing that at stake here was not just this one dam, but a precedent that would allow dams in all parks, he publicly condemned the idea, writing, 'Is there not some place in this great nation of ours where lakes can be preserved in their natural state; where we and all generations to follow us can enjoy the beauty and charm of mountain waters in the midst of primeval forests? The country is large enough to spare a few such lakes and beauty spots.'

Lane continued to force the issue, and Mather and Albright prepared their resignations; but at the last moment, it was Lane who resigned for personal reasons, and his replacement followed Mather's suggestions and killed the dam project.

There would be dozens of other attempts to destroy the nature of existing parks...

Sometimes they used more direct action. In 1925, Great Northern Railroad had been given permission to build a sawmill, in Glacier, while they constructed a hotel. Once the hotel was finished, the sawmill should have been torn down, but instead it continued to operate. After repeated warnings went unheeded, Mather went to Glacier himself.

Following his instructions, rangers planted 13 charges of TNT in the sawmill, while Mather calmly went into the hotel and invited the guests to come out and witness a show. When a large group of startled visitors were assembled on the hotel's porch, Mather personally lit the first fuse, and in short order the sawmill was reduced to dust. 'By such means as will leave them unimpaired' was taking on new significance.... (170)

As was mentioned previously, grazing was the first major external threat to the integrity of park resources. In 1917, Secretary Lane sought to open Yosemite, Sequoia, Glacier, and Mount Rainier to grazing to benefit the war effort. In June of that year, some permits for grazing were signed. 1918 brought
further pressure to open the parks. Horace Albright summed up
the affair by stating "There were a number of compromises on
grazing, but the parks came out of the war generally unscathed".
(200)

Although the parks were "generally unscathed" by grazing,
the 1920 "Annual Report of the Director to the Secretary" included
seventeen pages of descriptions of "proposed commercial raids" on
the parks. (179) The report was titled "A Crisis in National
Conservation." During that same year a major article titled "A
Crisis in National Recreation" appeared in American Forestry.
This article called attention to proposals which threatened to
commercialize the national parks and national forests. (261)
These reports set a precedent which would be of transcendent
importance. Major reports addressing the threats to the park
system would appear in the 1940s, 1960s, 1970s and 1980s
(10, 8, 238, 112).

Policy

Following the creation of a National Park Service, the
next most logical step to benefit the parks would be the issuance
of uniform policies to govern their management. This was critical,
as each park or monument established to date stood on its own
individual legislation or executive order. Beyond these legal
documents, the only guidance park managers had was a limited
number of park regulations issued by the Secretary of the
Interior.
On May 13, 1918, Secretary Lane issued the first Service-wide policy statement in the form of a letter to Mather. (136) This document was written largely by Horace Albright. (182) Following are excerpts from that policy which provide an interesting commentary on natural resources management philosophies at the birth of the agency.

Every activity of the Service is subordinate to the duties imposed upon it to faithfully preserve the parks for posterity in essentially their natural state.... In all of the national parks except Yellowstone you may permit the grazing of cattle in isolated regions not frequented by visitors, and where no injury to the natural features of the parks may result from such use. The grazing of sheep, however, must not be permitted in any national park....

You should not permit the cutting of trees except where timber is needed in the construction of buildings or other improvements within the park and can be removed without injury to the forests or disfigurement of the landscape, where the thinning of forests or cutting of vistas will improve the scenic features of the parks, or where their destruction is necessary to eliminate insect infestations or diseases common to forests and shrubs....

Mountain climbing, horseback riding, walking, motoring, swimming, boating, and fishing will ever be the favorite sports. Hunting will not be permitted in any national park.

For assistance in the solution of administrative problems in the parks relating both to their protection and use, the scientific bureaus of the Government offer facilities of the highest worth and authority. In the protection of the public health, for instance, the destruction of insect pests in the forests, the care of wild animals, and the propagation and distribution of fish, you should utilize their hearty cooperation to the utmost. (136) (emphasis added)

The reader will recall the discussion of the Service's Organic Act in terms of its application to natural resource protection as well as Mather's personal administrative philo-
sophy. This early policy statement parallels those almost word for word.

It is interesting to ponder whether or not the petition of the American Association for the Advancement of Science was issued because of dissatisfaction with these policies or if tangible resource problems were recognized. Whatever the case, policies were further clarified by a letter from Secretary Work dated March 11, 1925. (137) Following are key excerpts:

In national parks where the grazing of cattle has been permitted in isolated regions not frequented by visitors, such grazing is to be gradually eliminated. The cutting of trees is not to be permitted except where timber is needed in the construction of buildings or other improvements within a park or monument and only when the trees can be removed without injury to the forests or disfigurement of the landscape; where the thinning of forests or cutting of vistas will reveal scenic features of a park or monument; or where their destruction is necessary to eliminate insect infestations or diseases common to forest and shrubs.

In the solution of administrative problems in the parks and monuments relating both to their protection and use, the scientific bureaus of the Government are called upon for assistance. For instance ... in the destruction of insect pests in the forests, the Bureau of Entomology of the Department of Agriculture is called upon; and in the propagation and distribution of fish, the Bureau of Fisheries of the Department of Commerce gives its hearty cooperation.

Hunting is not permitted in any national park or monument except in Mount McKinley National Park, Alaska, in accordance with the provisions of the organic act creating it. (137)

These were only minor improvements in park policies. Strict protection of the natural features of the parks was a goal left for successive administrations.
Mather Retires

When Stephen Mather was forced to retire, because of poor health, he could be proud of the accomplishments of the Service in protecting and managing the natural resources of the System. The agency's Organic Act had been signed, policies had been written, the foundation of a Washington Office had been established, and numerous resource related activities were well underway. Of particular importance were the successful campaign to ward off the irrigation project in Yellowstone and the partially successful effort at controlling grazing in the parks. Just as Mather's "Crisis in National Conservation" set a precedent, so did Mather's firm stand with regard to outside influences on park resources.

When Mather first came to Washington, in 1915, the National Park System included 30 units. In 1916, at the creation of the National Park Service, there were 37 units in the system. By 1928, when Mather left, there were 58. (189) That increase produced a tremendous amount of diversification in the type of natural resources that the Service was responsible for protecting.

In November of 1928, Steven T. Mather suffered a stroke, brought on partially by his heavy work load, and 14 months later died. Tributes poured in from the President, from industry leaders, from the press, and from thousands of grateful park visitors. But the best testament to his now almost forgotten work was offered by Representative Louis C. Cramton, himself a strong supporter of Mather and his programs. Addressing the House, Cramton paid tribute to this outstanding figure in the public service who has sacrificed his money, his health, his time, and his opportunity for wealth, in order that he might promote that
which will mean so much to the people of this country in the future...There will never come an end to the good he has done.' (170)
Horace M. Albright was anything but inexperienced when he took over leadership of the National Park Service. He had served as Mather's right hand and had functioned as Acting Director on numerous occasions. Philosophically, Albright held many of the same opinions as his predecessor and, therefore, made few significant organizational or operational changes initially. This was particularly true in relation to natural resource management. This is not meant to imply that the work of national park preservation was not moving forward.

Mather was a brilliant, but sometimes erratic administrator, whose administrative style was a highly personal one. Albright took steps, as he said he would, to create a more orderly administration that depended less on personal relationships. Of particular importance in the 1930 reorganization of the service was the delegation of authority among staff officers, something Mather had been unable, or unwilling to do.

None of this is to say that Albright was a mere shadow of his former boss. He was too forceful a man for that. Moreover, if anything, his view of the mission of the National Park Service was broader than Mather's. This was most vividly expressed in Albright's approach to historical areas.

After the creation of the National Park Service, the next two high water marks of the Service's history came with the Executive Branch reorganization of 1933 and the beginning of the public works programs including the Civilian Conservation Corps. Albright was actively involved in both.
The Depression and the New Deal

In 1930, the nation was in the midst of the most serious depression it had ever experienced. 1933 saw the inauguration of Franklin D. Roosevelt as president and brought a new sense of hope. Immediately after he entered office, he began to establish his New Deal, a program which would have sweeping impacts on the management of park resources.

The results of these efforts were actually realized after Albright moved on from the Directorship, however, a good deal was accomplished in the management of natural resources during the years immediately preceding the New Deal. This trend continued throughout the duration of the New Deal programs, although many of the natural resource related accomplishments have been over shadowed by the tremendous strides of the Service in the areas of historic preservation and facility development and improvement.

Organization

The first efforts aimed at organizing the overall natural resources management program on a servicewide basis can be found in the Albright administration. This is manifest in the creation of a Branch of Research and Education, a Branch of Lands and in the work of George M. Wright.

Natural History and Forestry

In 1928, a committee was appointed by the Secretary of the Interior to examine the research and educational roles of the National Park Service. (40) This committee should not be confused
with the National Park Educational Committee, which was established in 1918 and which became the National Parks Association in 1919. One result of the analysis and recommendations of this second committee was the creation of a Branch of Research and Education on July 1, 1930. This new Branch, located in Washington, D. C., replaced the old Educational Division originally established by Mather, and was placed under the leadership of Dr. Harold C. Bryant. He was assisted by Dr. Wallace W. Atwood, a specialist in earth sciences and Verne E. Chatelain, an historian. Although much of this group's focus was on interpretative endeavors, the beginning of natural history research can be traced to these men. The facilities of the original Educational Division at Berkeley were maintained as a field office of the new Branch.

The Committee on Educational Problems was disbanded in 1931 (40). Presumably this was done because the problems identified by the committee had either been resolved or were in the process of being resolved.

John Coffman, the Service's Fire Control Expert, appointed by Mather in 1928, continued to maintain his office in Berkeley (4). Sometime between 1928 and 1933, Walter Harold Horning was hired as Coffman's assistant (6). Early in 1933, Coffman was called to the Washington Office to begin ground work for the Civilian Conservation Corps and other public works programs. Shortly thereafter, he succeeded Ansel Hall and his title was changed to Chief Forester. (6)
Wildlife Management

The late 1920s and early 1930s also saw the emergence of George M. Wright as one of the prominent NPS personalities promoting wildlife management and eventually founding a Wild Life Division. George Wright is often considered the father of natural resources management in the National Park Service. This is not entirely true, as John Coffman was involved with forestry issues as early as 1928 and Ansel Hall, although he had the title Chief Naturalist, certainly had an influence on the management of the resources of the parks throughout the 1920s.

Wright came to the Service via the interpretive programs of Yosemite National Park. He had been a student of Joseph Grinnell, the pioneer in vertebrate ecology at the University of California and worked as a summer naturalist at Yosemite. (199)

In 1929 and 1930, Wright personally financed and conducted the first comprehensive survey of wildlife problems in the national parks.

The necessity for such a survey was well stated by Mr. Wright as follows (letter of May 10, 1931, to Assistant Director H. C. Bryant):

(a) Animal life constitutes one of the important assets of the National Parks System.
(b) This asset is even more sensitive to the detrimental effects of civilization than almost any other park feature.
(c) The status of animal life in the parks is already far from satisfactory.
(d) Mere protection is not enough to restore this asset, more positive action being necessary to counteract the many unfavorable influences.
(e) The personnel of the Service does not provide qualified men with time to devote to the specialized problem of animal administration.
(f) Studies of park fauna by outside scientists have
provided essential reference material but no practical methods for solving the animal problems confronting park administrators. (34)

In 1931, office space was provided to Wright in the Berkeley office of the Branch of Research and Education. (199)

Finally, in 1932, a Wild Life Division was established within the Branch of Research and Education. As might be expected, George Wright was named as the first Division Chief. About the same time, federal funding was provided for Wright to continue his survey work.

Coincident to these events, a Supervisor of Wild Life Resources was appointed on March 25, 1931 and a second field office was established in Salt Lake City, Utah. (153) David Madsen, formerly a Utah Fish and Game Commissioner, a Refuge Manager with the Biological Survey and an NPS Assistant Land Purchaser, assumed that position. (153)

Memoranda from the early 1930s indicate that the Wild Life Division and the Supervisor of Wild Life Resources operated autonomously but in concert with one another. The former having research, survey and policy responsibilities and the latter having management accountability. (153)

The Branch of Lands

A third major organizational change came in 1928. During that year a Branch of Lands was established. (188) Prior to that time, the Director's office was immediately involved in all land management issues. Bartlett Lewis was named as Assistant Director in charge of the Branch and was responsible for land acquisition, drafting and new park proposals. Lewis retired in August,
1930 and Conrad Wirth was asked to take his place (203).

As assistant director in charge of the Branch of Lands, I had responsibility for all land matters, including investigation, study, and reporting on proposed new areas for the park system, as well as land acquisition. Superintendent Roger Toll of Yellowstone was the principal pivot man for most of the field investigations of proposed new parks and monuments. I had a secretary and two draftsmen in my Branch of Lands, and besides land maps we prepared maps used in the publications issued for park visitors. The national highway system of the western states wasn't anything like it is today, and our Park to Park Highway Map of the western parks was always in demand. (203)

In 1931, a Branch of Planning evolved from the Branch of Lands. Conrad Wirth was named Assistant Director over this new Planning Branch. (188) Both of these Branches were soon to have incomprehensible tasks placed before them with the rapid expansion of the Service in the 1930s and with the mobilization of the New Deal programs like the Civilian Conservation Corps.

Figure 1 lists the individuals who were involved in the various aspects of natural resources management at the end of 1933. These individuals would provide the nucleus for the rapid expansion of natural resource management activities in the next administration.

Programs

It is appropriate at this point to shift our focus away from the use of Yellowstone as an example of resource management activities, as was done in previous chapters, and to concentrate, instead, on those activities which were directed by the Washington office personnel.
Branch of Research and Education
Assistant Director - Harold Bryant

Earth Sciences - Dr. Wallace Atwood

Wild Life Division
Chief - George M. Wright

Supervisor of Wild Life Resources - David Madsen

Chief Forester - John Coffman

Branch of Lands
Assistant Director - Bartlett Lewis

Branch of Planning
Assistant Director - Conrad Wirth

Figure 1

NATURAL RESOURCES MANAGEMENT
ORGANIZATION
1933

Sources: Conservation History File, National Park Service Archives, Harpers Ferry, West Virginia.

Fire Control File, National Park Service Archives, Harpers Ferry, West Virginia.

Management Biology File, National Park Service Archives, Harpers Ferry, West Virginia.
As was the case during the period of 1872 to 1927, significant resource issues and programs rose to the surface during the late 1920s and early 1930s. Certainly the work of John Coffman on forest management and of George Wright on wildlife management was significant. In addition, the first Chief Ranger's and Naturalist's Conferences were held during this period.

**Forest Protection**

During this time, Coffman made major strides in bringing the Service up to a professional level in fire and forest management. In 1930 Albright reported that fire plans were being prepared for all of the National Parks. (17)

The agency was then [1928] completing its second year as a member of the Forest Protection Board, and with Coffman as a sympathetic liaison, the Park Service, along with other participants on the board, prepared a comprehensive fire prevention plan that detailed the requirements for adequate facilities and patrols for every park in the system. Congress made the first national appropriation ($10,000) for fire protection in the parks; previously the money had been assigned to individual parks. The need for better presuppression capabilities was also stressed, and at last the Park Service was allowed to spend fire funds for presuppression work; fire lookouts were not authorized until 1931, however. And finally, Sequoia, whose superintendent had brazenly advocated light burning, began an expensive campaign, financed by special congressional appropriation, to remove by hand, flammable debris from around its groves of Big Trees. (194)

In 1932 alone, it has been reported that six new fire lookout towers were constructed in various parks, trees were measured in Sequoia National Park and a nursery was established there. (78) Vegetation type maps were prepared for a number of national parks and White Pine Blister Rust control efforts were intensified (31,78). White Pine Blister Rust (WPBR) control actually began
as early as 1915 in Yosemite and in 1921 in Acadia National Park (31,185).

Coffman also placed emphasis on restoration of impacted areas. In 1932, it was reported that Yosemite was using roadside ditches and boulders to prevent vehicles from entering meadows and that social roads were being restored. (18)

Wildlife Management

George Wright's wildlife survey work continued during this period. Wright's two assistants, Joseph Dixon and Ben Thompson, both joined the ranks of the agency (199).

The preliminary wildlife survey of the national parks was completed and the results made public in 1933 in a 157 page bulletin, Fauna of the National Parks of the United States. This publication became the basis for later management practices, and was the first of a national park fauna series put out by the Department of the Interior. (34)

The efforts of the Wild Life Division were augmented by those of David Madsen as Supervisor of Wild Life Resources. Madsen apparently had an affinity to fishery resources and much of his correspondence deals with fish stocking programs. In this vein, the Lake Hatchery in Yellowstone National Park was completed, a new hatchery at Mt. Rainier National Park was built and new rearing ponds were constructed at Grand Teton (78). However, fish were not his sole interest as illustrated by his appointment to a bear committee, by the Director, on December 18, 1931 (153). A memorandum from Harold Bryant to the Director, dated October 11, 1933, indicates that Madsen was involved in studies of local wildlife problems, in making recommendations concerning big game management and in maintaining contact with
state fish and game commissions, sportsmen's organizations and
the American Game Conference (155).

Predator control and the management of bison continued as
areas of concern during Albright's administration. The follow­
ing excerpts, from Cahalane's writings on these subjects, will
bring the reader up to date on these issues.

In 1928, the scientific viewpoint on predator con­
trol was presented to a conference of superintendents by
Dr. Joseph Grinnell, Director of the Museum of Verte­
brate Zoology, University of California. Knowledge of
predators and their place in the fauna was growing and
recognition of their value was hastened by numerous
scientific societies and individuals. During 1929 and
1930 the National Park Service was the recipient of
numerous resolutions and letters condemning predator
control without adequate justification based on scienti­
fic investigation. Among the organizations insisting
upon this course were the American Society of Mammalo­
gists, the Wilson Ornithological Club, Cooper Ornitholo­
gical Club, New York Zoological Society, and the Boone
and Crocket Club. Concurrence with this point of view
was expressed in replies by Director H. M. Albright. The
Service was placed on record by Mr. Albright's statement
in the May 1931 number of the Journal of Mammalogy,
pp.185 186.... (256)

Despite this affirmative step, predator control would surface as
an issue in future years.

Due to [the] continued surplus of buffalo in the
park, one management practice has continued — that of
artificial feeding. (160)

Albright's administration was plagued with many other
wildlife population problems including the mule deer over abun­
dance on the Kaibab Plateau, just north of the Grand Canyon; the
Jackson Hole elk, which prompted the creation of a Commission on
the Conservation of the Jackson Hole Elk in 1927; and deer in
Yosemite National Park (55). Finally, 1930 marked the first time
that a deer overpopulation problem existed in Zion National Park.
Thus another park was added to the long list of parks with wildlife population problems.

As early as 1932, Wright recognized the extent of the wildlife problems of the parks and called for the appointment of "Wild Life Rangers" who would act as a park representative on wildlife issues (156).

Two Conferences

In 1926, the Chief Rangers of the Service held their first conference. Prior to this time, only the Superintendents had been brought together. One of the major topics of discussion at this conference was fire control techniques. Fire plans were recommended for each park for the first time at this meeting. (145)

The first park naturalist's conference was held from November 1 to November 30, 1929, at the then Educational Division office in Berkeley, California. Although the vast majority of the conference focused on interpretive techniques, four days were devoted to natural resource management subjects. These included discussions on "natural balances", predator problems, protection of scientific assets from development, research, research reserves, wildlife problems, and White Pine Blister Rust control. (167) These conferences were particularly important because they provided the first forum, outside of the Director's Annual Reports, in which natural resource management concerns were addressed by field personnel on a Servicewide basis. This is not meant to imply that the reports from the Superintendent's Conferences did not address similar issues, but rather, that
these were the first records from non managerial personnel.

**Policies**

Although fundamental policies did not change during Albright's administration, some specific changes occurred in relation to the details of park resource management. Following is a summary of those policies as they pertain to natural resources:

... Proper administration will retain these areas in their natural condition, sparing them the vandalism of improvement. Exotic animal or plant life should not be introduced. There should be no capture of fish or game for purposes of merchandise or profit and no destruction of animals except such as are detrimental to use of the parks now and hereafter. Timber should never be considered from a commercial standpoint but may be cut when necessary in order to control the attacks of insects or disease....

As with the previous administration, the policies reflected social and professional norms of their day.

Just prior to Albright's retirement, a short article on research in the National Parks, authored by the Director, appeared in the *Scientific Monthly*. Albright presented his philosophy concerning research in the national parks in that article.

Research is necessary not only to the preparation of interesting material to serve as a basis of the naturalist and historical service, but it also is fundamental to the actual protection of the natural features of the parks, as enjoined in the acts establishing the parks and in the act of August 25, 1916, creating the National Park Service.

Following fundamental protection came the re-stocking of certain depleted natural ranges. Before going farther with this particular subject, it is important to emphasize that the policy of the National Park Service is unalterably against the introduction of exotic species of animals or plants in the national parks or national monuments, except for the occasional
stocking of an otherwise barren body of water with some species of game fish for the enjoyment of lovers of the Waltonian sport. Wherever animals are introduced, it is to restock a natural range which has become depleted because of some unnatural condition or series of conditions.

It has become increasingly evident, however, that a management plan of some sort must be inaugurated by the National Park Service, in order to restore and keep the park wild life in its primitive state despite the effects of human influence. This necessitates, first of all, complete investigation.

Plant life problems, while perhaps not as pressing as those pertaining to the wild animals, are equally important. Forest fires present a constant potential menace to the trees, but improved methods of fire prevention and combat are handling this problem excellently.

Other enemies of park forests are insect infestations and tree diseases. Just as in the case of the wild animals, changing conditions outside park boundaries affect the trees inside. Insect devastations generally start outside the parks, from there encroaching on the trees inside. (205)

The Director's statements clearly reinforce those quoted previously. One subtle change, in these policy statements compared to those of the previous administration, is that exotic fauna and flora, except game fish, are not to be introduced into the parks. Perhaps the Service was responding to the 1921 petition by the American Association for the Advancement of Science.

The final line of the Director's statement is interesting in view of the fact that current policy relative to forest insect and disease management comes under fire because parks are frequently accused of being harbingers of insects and diseases which spread out of the parks onto adjacent lands.

Although Albright's policies were very similar to Mather's, an article in The Journal of Mammalogy in May 1931
indicated that the servicewide policy on predator control had shifted.

Predatory animals are to be considered an integral part of the wildlife protected within national parks and no widespread campaigns of destruction are to be countenanced. The only control practiced is that of shooting of coyotes or other predators when they are actually found making serious inroads upon herds of game or other mammals needing special protection. (256)

**Historic Preservation and the New Deal**

Albright was a long time history buff who believed that the National Park Service had a responsibility to preserve significant aspects of the nation's past along with the great scenic areas. With the able help of U.S. Representative Louis Cramton of Michigan, Albright brought the National Park Service much more deeply into the field of historic preservation. (201)

An extensive account of this expansion as well as the agency's participation in New Deal programs has been prepared by Harlan Unrau and C. Frank Willis (201).

The year 1933 served as a watershed in the development of the National Park Service. Not only did the reorganization in that year substantially increase and diversify the areas administered by the bureau, but a variety of New Deal emergency work relief programs that were passed provided the Service with a massive infusion of personnel and funds to accomplish long term development projects in the parks that had been contemplated for more than a decade but that had been postponed because regular appropriations and manpower had only been sufficient to meet immediate requirements. Throughout the 1930's various New Deal programs and agencies continued to provide funding and personnel to the National Park Service for a wide variety of park related development projects with the result that developments in the national, state, county, and municipal parks were carried forward fifteen to twenty years ahead of schedule had regular manpower and appropriations been relied upon. (201)

During the 1930s, the National Park Service was directly tied to five New Deal emergency relief and public
works agencies the Emergency Conservation Work Organization (ECW) that directed the work of the Civilian Conservation Corps (CCC), the Federal Emergency Relief Administration (FERA), the Public Works Administration (PWA), the Civil Works Administration (CWA), and the Works Progress Administration (WPA). These programs had tremendous impacts on every aspect of park operations including natural and cultural resource management.

**Albright Retires**

[Albright] had several times been tempted by lush offers from business corporations. He did not wish to leave the Park Service, however, until he was sure it was safe from the politicians and commercial interests. It had been secure during Hoover's administration, and the election of Franklin Roosevelt was reassuring, for Roosevelt had long been an ardent conservationist. When [Roosevelt] chose Harold Ickes for Secretary of the Interior it was clear that the Park Service was to have all the support and protection that an honest, intelligent and valiant Secretary could provide; and Albright felt free to leave. On July 17, 1933 he tendered his resignation....

At the time of Albright's retirement the number of units in the Park System had leaped to 137. The degree of complexity of resource issues had become awesome. Although things looked bright for the parks, the economic conditions of the country posed a grave threat to them. Both problems were left for the succeeding administration.
Chapter 5

THE CAMMERER YEARS

Albright's Able Successor

Shortly after Franklin Roosevelt's election, Harold Ickes was selected to become the next Secretary of the Interior, replacing Ray Wilbur. Ickes was a staunch supporter of the parks and park preservation (187). The selection of a dependable Secretary opened the door for Albright's retirement and set the stage for the appointment of a new Director. A committee, appointed by the Secretary to select Albright's successor, felt that Newton Drury, famous for his activity with the Save the Redwoods League, was the right person. Drury rejected the offer so the committee turned to Arno Cammerer. Cammerer had actually been Albright's first choice all along.

Although Cammerer was not the committee's first choice, he was certainly well qualified for the position. In 1919, when he first joined the Service, he was appointed as the Assistant Director, succeeding Albright who had moved to the Superintendency at Yellowstone National Park. Then, in 1929, when Albright succeeded Mather as Director, Cammerer was moved into the position of Associate Director. (187)

Emergency Conservation Programs and Regionalization

As has been mentioned previously, Cammerer assumed the
Directorship when the country was in an economic crisis. That crisis included many of the park concessioners. (187) Despite these nagging problems, park preservation work pressed forward. The development of the emergency conservation programs forced the establishment of four regional offices; one each in Richmond, Virginia; Omaha, Nebraska; Santa Fe, New Mexico; and San Francisco, California. The initial focus of these offices was on the administration of the emergency conservation work programs within the national and state parks. With time, however, direct supervision to the park superintendents emerged as a regional function. At first, the regionalization was fought by the superintendents because they enjoyed direct access to the Director. Eventually the superintendents conceded and the regionalization became effective on August 1, 1937. (185)

**Legislation**

The Cammerer years produced a number of important resource management related pieces of legislation. Foremost among those was the Historic Sites and Buildings Act of 1935. The focus of this act is on historic preservation and the authorization of the Advisory Board on National Parks, Historic Sites, Buildings and Monuments. The Board was originally conceived to advise the Service on cultural resource management issues but, it has enlarged its realm of interest and now advises on natural history matters as well.

Between 1933 and 1940, the size of the park system grew
steadily. The system also expanded in types of areas administered. New areas included swamplands, a major island complex off the Pacific coast and several desert areas. On May 30, 1934 Everglades National Park was authorized. Other New areas included Cedar Breaks, Big Bend, Joshua Tree, Capitol Reef and Channel Islands.

Additions were made to several other parks. In June 1935 the Wind Cave National Game Preserve was added to the Wind Cave National Park. In May 1938, Congress appropriated $30,000 for the addition of lands to Rainier.

On June 20, 1938, Congress enlarged Hawaii National Park to take in a fine beach and primitive Hawaiian village, additions wanted by the Park Service to preserve an area of Hawaiian culture. On the same day, Congress added to Isle Royale 100,000 acres that had been bought with emergency relief funds. On February 12, 1938, Congress appropriated $743,265 for the purchase of lands in Great Smoky Mountains; in February 1939 President Roosevelt proclaimed an addition of 39,488 acres to Carlsbad Caverns; and on January 2, 1940, ... he proclaimed an addition of 187,411 acres to Olympic. (187)

Finally, the Park, Parkway and Recreational Areas Study Act was authorized by Congress on June 23, 1936. This opened the door of the Park System to a new type of area - the recreation area. National Parkways, National Recreation Areas, National Seashores and Recreation Demonstration Areas fell within this group. On October 13, 1936 the first reservoir associated recreation area was established - Lake Mead. Finally on August 17, 1937 the first National Seashore was authorized at Cape Hatteras. As with the Albright administration, the complexity of the Park System continued to increase, bringing new challenges to resources management personnel.
Although the New Deal began while Albright was still the Director, its impact on the natural resources management programs of the National Park Service was not seen until Arno Cammerer took charge of the agency. The employment programs of the New Deal provided a tremendous infusion of manpower and funds to the Service. This boost could not have come at a more appropriate time, considering the significant number of new areas brought into the Park System at the close of Albright's administration and during that of Cammerer. Most notably, the Civilian Conservation Corps (CCC) made countless contributions to the Service's resources management efforts in the areas of wildlife, research and publications, scientific illustration and photography, geology, forestry and real estate management. A discussion of each of these areas follows.

Since the small, old line staff park administrators and planners could not possibly handle the Service's share of this vast program without large increases in funding and manpower, CCC funds were used for the necessarily extensive additional staffing as well as for operation of the camps themselves. As a result it was estimated ( unofficially) that by the end of the '30s some two thirds of the Service's total annual expenditures were being financed with CCC funds. (199)

**Wildlife Management**

Augmentation of the Service's manpower with CCC funds extended into wildlife management activities.

George Wright was not one to miss such an opportunity, especially since conservation groups were expressing concern that the CCC programs, unless adequately supervised, might inflict severe damage upon the unique and fragile ecological resources of the parks. By 1936 there were 27 (4 regular, 23 CCC) biologists
(then called Wildlife Technicians) on the Wildlife Division staff. Some of these were headquartered in the parks, but in conformity with the Service's overall regionalization in 1936, many ... were placed in the regional offices... and given responsibility for the supervision of extensive field territories. (The number shrank after 1936.)

Other divisions and branches of the Service were able to expand in like fashion, particularly in the fields of landscape architecture, engineering and forest protection .... (199)

Between 1933 and 1939 this Wildlife Division would make tremendous advances.

The work originally commenced by Wright, in 1929, was finally published in 1933 as the Preliminary Survey of Faunal Relations in National Parks better known as "Fauna Number 1."

That the Preliminary Wildlife Survey was in the forefront of its time and in tune with modern concepts, is apparent from the opening remarks of Fauna No. 1: "...intensification of the protective function until ... poaching has been reduced to a minimum ... has not been enough. The need to supplement protection with more constructive wildlife management has become manifest with a steady increase of problems both as to number and intensity ...

"The policy of non interference with wildlife became more and more deeply intrenched. Protection would do the rest. Nevertheless, time proved that management of some sort would have to be invoked to save certain situations, especially as the parks were opened to thousands of visitors, causing a flood of fresh complications.

"The conclusion was unavoidable. Protection, far from being the magic touch which healed all wounds, was unconsciously just the first step on a long road ... to restore and perpetuate the fauna in its pristine state by combating the harmful effects of human influence.

"The park faunas face immediate danger of losing their original character and composition unless the tide can be turned. The vital significance of wildlife to the whole national park idea emphasizes the necessity for prompt action. The logical course is a program of complete investigation, to be followed by appropriate administrative action.

"The unique feature of the case is that perpetuation of natural conditions will have to be forever reconciled with the presence of large numbers of people on the
scene, a seeming anomaly. A situation of parallel circumstances has never existed before. Therefore the solution cannot be sought in precedent. It will challenge the conscientious and patient attention of biological engineers. And because of the nature of the task, it is inherently an inside job. Constancy to the objective can be made a certainty only by employment of a staff whose members are of the Service, conversant with its policies, and imbued with a devotion to its ideals.

'The only hope rests in restoring the original vessel (biological integrity of the parks) to wholeness ... failure here means failure to maintain a characteristic of the national parks that must continue to exist if they are to preserve their distinguishing attribute. Such failure would be a blow injuring the very heart of the national park system.'

Fauna No. 1 went on to analyze the major ecological situations and problems prevailing in each park in the late '20s and early '30s, making specific management recommendations as well as urging more research. It devoted considerable attention to the Yellowstone elk situation, which had been cause for concern since 1911, warned of further range destruction, urged control as well as more research. (199)

This publication was the first in what would become a series.

On July 30, 1934, the name of the "Wild Life Division" was officially changed to the "Wildlife Division", per Office Order #275. This was in keeping with the use of the vernacular and with a change in the U. S. Government Style Manual. (156)

In 1935, the Wildlife Division was transferred from Berkeley to Washington, DC. George Wright and Ben Thompson, both moved to Washington, DC. Thompson served as the Assistant Chief of the Division. Joseph Dixon remained in California as a Field Naturalist. Shortly after his transfer, Thompson was selected as a Special Assistant to the Director. Victor H. Cahalane filled Thompson's position in February 1935. With this transfer of the Division came the responsibility for overseeing wildlife management activities at all CCC camps managed by the Service.
In retrospect it has often seemed almost incredible that during the CCC program the biologists were required to review all proposed management and development projects involving wildlife or its habitat, in the parks for which they were responsible, and to check on the ground any proposals that might adversely affect natural values. Such projects had to be cleared in those days by the biologists as well as by the landscape architects and engineers before they could be approved at higher levels. (199)

It is interesting to note that an organizational chart, from 1939, shows Ben Thompson in charge of the Branch of Recreation, Land Planning and State Cooperation (156). One of the functions of this Branch was to coordinate CCC projects with other divisions and branches of the Service. Perhaps Thompson's close ties with the Wildlife Division facilitated the opportunity for biological review.

Exactly what that review consisted of is best explained by citing several examples. Prior to the beginning of enrollment periods of the Emergency Conservation Work program, each camp was required to submit a list of potential projects to the Wildlife Division for review. During the 5th Enrollment Period, the enrollees at the Yosemite National Park Camp wanted to engage in an erosion control program in the Yosemite Valley. This project was approved. The enrollees at the Yellowstone Camp sought permission to construct wildlife salting troughs, islands for Trumpeter Swan feeding and nesting, and to conduct bear patrols. (156) The Wildlife Division felt that the enrollees' time would be better spent at Yellowstone if fewer bear patrols (live trapping and relocating and running out of campgrounds) were conducted and more time was spent on building bear proof food safes.
and garbage cans.

Apparently George Wright also had no reservation about suggesting policies which would have applied to all CCC camps. Correspondence from Wright took issue with the presence of dogs and cats in CCC camps, provided direction on the limitation of the construction of bird feeders adjacent to camps and urged a sense of discretion on fence row and roadside cleanups. (156) Few stones were left unturned. John Paige indicates that oversight, by George Wright and his staff, on CCC development projects actually became a significant issue (193).

The activities of the Wildlife Division during this decade were not limited to CCC functions. Numerous Office Orders were issued on subjects ranging from mosquito control to exotic plants to use of poisons on rodents and predators. The Division participated in a series of radio programs developed in 1934 to promote the parks during the "National Parks Year." The staff worked on annual wildlife censuses, range surveys which were done in conjunction with the vegetation type mapping of the Branch of Forestry, and urged the preparation of faunal type maps. (156)

A report on wildlife conservation in the National Park Service, prepared by Victor Cahalane, Cliff Presnall and Dan Beard, gives an extensive account of the activities of the Wildlife Division from 1930 to 1939 (34). The report includes discussions on animal feeding, bears, ungulate herd management, burro problems, non-native animals and fish conservation. The following excerpts from that report are provided to give the flavor of the wildlife management activities of that decade.
One of the most widely known achievements of the National Park Service, and one that has perhaps done more to influence public opinion toward conservation than any other single project of the Service, is the preservation of the trumpeter swans. It is interesting that this project coincides with the decade covered by this report. It was early in 1930 that Mr. George Wright and his associates started active work to preserve these, the largest and rarest of all American waterfowl; and now, at the close of the decade, there is in operation a definite plan which gives every indication of assuring preservation to the swans. In 1930 there were but 2 known breeding pairs in Yellowstone National Park.... On April 22, 1935, the Red Rock Lakes Migratory Waterfowl Refuge was established, and since that time the National Park Service and the Biological Survey have together taken a long stride toward preventing extermination of the trumpeter swans in the United States....

Preservation of bighorn in the west is another example of conservation rendered more effective through cooperation. This noble animal occurs in 13 of the areas administered by the Service, in all of which special measures are taken for its protection. In studying reasons for a general decrease in bighorn from 1930 to 1937, and in searching for remedial measures the Service has cooperated with the Bureau of Animal Industry, the Bureau of Biological Survey, the Montana Veterinary Research Laboratory, the California Academy of Sciences, and various other public and scientific organizations. Resultant improvements in bighorn management, coupled with natural environmental changes not yet fully understood, have produced a slight but noticeable increase since 1937. (34)

The report went on to explain wildlife conditions in 20 parks. The conclusion of the report includes a call for more personnel in wildlife management positions, better alignment of park boundaries to provide adequate wildlife habitat and legislative authority to carry out wildlife protection. (34)

Unfortunately, the vigor of the Service's wildlife management program suffered a tragic blow. On February 25, 1936 George Wright and Roger Toll, Superintendent of Yellowstone National Park, were killed in an automobile accident.

On February 25, 1936, George Wright and Roger Toll
... were driving from El Paso to Tucson, as members of a joint international commission which had been studying the possibilities of establishing international parks and wildlife refuges, including Big Bend, along the U.S. Mexican boundary. National Park Service Regional Wildlife Technician W. B. McDougall, and Dr. W. B. Bell of the Bureau of Biological Survey were following in another car. A third vehicle was approaching from the opposite direction. Suddenly one of the rear tires of the approaching car blew and it swerved directly into the path of the one driven by Superintendent Toll, killing him and George Wright. (199)

After Wright's death, Victor Cahalane took charge of the Division and continued to push for excellence in wildlife management.

Vic [Cahalane] pushed the Division's program vigorously, and perhaps he might have saved most of it, eventually, if World War II had not added its further disruption to the first grievous setback. But no one else had George Wright's ability to placate and win over the opposing school of thought which, increasingly, was coming to feel that biologists were impractical, were unaware that 'parks are for people', and were a hindrance to large scale plans for park development.

By 1937 administrative sentiment in Yellowstone had reverted so strongly to coyote control to 'preserve' antelope, mule deer, and bighorn, that Cahalane had to assign biologist Adolph Murie to the park for a two year ecological study. Murie's resulting report on 'Ecology of the Coyote in the Yellowstone' upheld the Service's policy on the protection of predators, was a major contribution to animal ecology, and became required reading in some university wildlife management courses....

In 1938 Fauna No. 3, 'Birds and mammals of Mount McKinley National Park, Alaska', by Joseph Dixon, was published and its content was non controversial. But, in 1939, a national controversy boiled up over an increase in wolves and a decline in Dall sheep at McKinley. It looked as though certain influential sportsmen would get Congress to pass a bill requiring wolf control in the parks, thereby threatening the Service's basic management policies. Adolph Murie was dispatched there for two years as a factfinding, biological troubleshooter. His resulting report, 'The Wolves of Mount McKinley' presented the biological facts so effectively that pressure for wolf control subsided. His work became, and still is, a classic in the literature of vertebrate ecology and wildlife management, and like his previous one, was required reading in many university classes. (199)
Just as the Wildlife Division was moving forward in its efforts to protect wildlife, so was David Madsen, as Supervisor of Wild Life Resources. In March of 1934, Madsen's title was changed to Wild Life Expert; perhaps to reflect his consulting role. That title held for about a year and on May 15, 1935 he was appointed as Supervisor of Fish Resources. Some correspondence indicates that he also held the title of Fish Culturalist for a brief period in 1935, but his supervisory title was the more favored. All indications are that by 1935 Madsen had actually been placed under the supervision of George Wright. (155)

Highlights of Madsen's work include continued emphasis on fish stocking programs, development of a stream and lake survey program, and preparation of the Service's first fisheries policy.

While Wright and Madsen supervised the wildlife management program on the Service, George Baggley served as the Wildlife Supervisor for the State Parks Program under the Emergency Conservation Work program.

Research and Publications

Two of the major byproducts of the expansion of the wildlife management program were a large increase in scientific research in the parks and a corresponding increase in the number of scientific publications and articles written by and for the National Park Service.

The reader will recall the article prepared by Albright on research in the parks in which he stated that "research is fundamental to the actual protection of the natural features of the parks." (205) Albright's interest in research in the parks was
further manifest by the work of the Committee on Educational Problems which gave numerous recommendations on the Service's research effort. This interest came to fruition in a variety of forms during the 1930s. The "Director's Annual Report to the Secretary of the Interior" for 1933, as is the case with most of the "Director's Annual Reports", cites studies by several scientists including Dr. Ernst Cloos, of John Hopkins University, on the granites of Yosemite; Dr. Field, of Princeton University, on the geology of Yellowstone; and Lewis Williams, of the University of Wyoming, on the flora of Grand Teton. (56) Each year there after more and more studies were cited. (57,58)

By 1934, correspondence from the Wild Life Division indicates that "Research Reserves" had been designated in a number of the parks. One memorandum, from Ben Thompson to the Director, in 1934, suggests that part of the basis for the Service's research areas was an article by a Dr. Shelford, which appeared in a 1933 issue of Ecology. Thompson's memorandum outlined a nomenclature scheme set out by Shelford for nature sanctuaries. Because no units of the park system contained sanctuaries, as defined by Shelford, Thompson went on to suggest an alternative to the classification system. Thompson also mentions that four "Research Reserves" had been established at Lassen Volcanic National Park, five at the Grand Canyon and that Yellowstone and Mount Rainier National Parks were potential candidates for reserve designation. (156)

George Wright's Fauna No. 1 marked the beginning of a flurry of publications by the professionals in the Wildlife
Division.

Other bulletins in the series, all written by Wildlife Division personnel, are: Wildlife Management in the National Parks, 1935, 142 pages; Birds and Mammals of Mount McKinley National Park, 1938, 236 pages; and an Occasional Paper, History and Present status of the Breeding Colonies of the White Pelican, 1933, 83 pages. Another bulletin, Ecology of the Coyote in the Yellowstone, is now in press.

The number of articles written for scientific or popular periodicals by Service personnel is indicated by a record of 76 appearing in print during 1936 and 1937. Among the more notable of such articles was a 146 page bulletin on the life history and food habits of mule deer in California, which appeared in 1934, and has since received wide recognition as a reference work. Popular articles on trumpeter swans and bears have appeared in the Saturday Evening Post in 1938 and 1939, and a recent issue of the National Geographic contained an article on the deer of the world. (34)

Scientific publications were not monopolized by the Wildlife Division. As early as 1895 independent and university affiliated researchers had started publishing information about the parks. (157) Significant contributions were also made by the geology and forestry programs of the Service. As an example, William L. Effinger, working under the auspices of the California State Emergency Relief Administration, prepared three reports on the geology of some of the units of the National Park System (11,12,13). As did the wildlife biologists and geologists, the foresters published extensively. Publications included a Manual of Forestry, 1935; Tree Preservation Bulletins, 1935-1940; Occasional Forestry Notes; and a Fire Protection Training Handbook, 1939. (33) Tied closely to the development of these publications was heavy emphasis on training, particularly in the field of forest fire suppression (158). This program was critical
for the successful participation of the CCC men in fire protection activities. This training perhaps laid the foundation for the Service's current training program and certainly influenced the sophisticated fire management training available today.

Scientific Illustration and Photography

Working closely with the Wildlife Division was Walter A. Weber. Weber was the Service's first scientific illustrator and worked for the agency between 1936 and 1941. During that time he prepared an extensive number of paintings on wildlife subjects. Many of his original works can still be found hanging in various agency offices. Weber also prepared one of the first posters utilized by the Service to warn visitors of bear hazards (Figure 2).

After leaving the Service, Weber provided the illustrations for the book Fading Trails, the Story of Endangered American Wildlife as well as 25 other titles. In 1949, he became a staff artist with the National Geographic Society and drew numerous illustrations for the Society's magazine.(130)

When the Branch of Research and Education was first established, it included the position of a Chief Photographer. By 1931 that position had been transferred from Berkeley, California to Washinton, DC. In 1935, the laboratory and staff were absorbed as Departmental entities. George Grant served as the Chief Photographer for the Service and later the Department. The photographic legacy he left is extensive. (146) In addition, Joseph Dixon established an extensive wildlife photograph collection for the agency. That collection is maintained by the
DON'T FEED THE BEARS

Bears at a distance are "safe" bears

Bears fed or fooled with are dangerous bears

For your protection: The feeding, molesting, touching or teasing of bears is prohibited

Figure 2
BEAR HAZARD POSTER

Branch of Graphics Research of the Service.

Geology

Although little has been written about the geological program of the Service it appears to have been very active during the 1930s. A brief summary of the organization of the Branch of Research and Education would be useful in understanding where the geologists fit into the picture. When last outlined the Branch was organized as shown on Figure 3. The 1935 reorganization of the Branch brought the Wildlife Division to Washington, DC and resulted in the creation of a Museum Division within the Branch under the leadership of Carl P. Russell. Supervision of the recently acquired and authorized historic sites was to fall to the Branch of Historic Sites and Buildings that was also created in 1935. Along with this reorganization came a fleshing out of the Wildlife, Naturalists' and Forestry Divisions. This expansion corresponded with the regionalization of the CCC programs. Thus the positions of wildlife and forestry technicians and geologists were established in regional offices.

Supervision of the regional geologists was accomplished through Franklin C. Potter, Associate Geologist under Earl Trager, Chief of the Naturalists' Division. Franklin Potter had Harold H. Hawkins, Assistant Geologist and C. H. Wegermann, Geologist, on his staff. As with the wildlife program, a supervisor over state park activities was designated to direct geological activities in those areas.

As might be expected, much of the work accomplished by these early geologists was interpretive in nature. Undoubtedly
Branch of Research and Education

Assistant Director (Branch Chief) - Dr. Harold Bryant

Staff Assistant (Earth Sciences)
Dr. Wallace Atwood

Naturalist Division
Chief - Earl Trager
Ass't Chief - H.E. Rothrock

Wild Life Division
Chief - George Wright
Ass't Chief - Ben Thompson

Supervisor of Wild Life Resources
David Madsen

Chief Forester
John Coffman

Figure 3

ORGANIZATION
OF THE
BRANCH OF RESEARCH AND EDUCATION
1933

Source: Management Biology File, National Park Service Archives, Harpers Ferry, West Virginia.
they contributed a great deal of information to the first park brochures and booklets. The preparation of the now noteworthy relief models of the national parks was a major responsibility of these geologists and the recently created Museum Division. Since many of these models were prepared by CCC labor, a training manual was prepared to assist them in this endeavor (30). The 1936 "Annual Report of the Director" provides an excellent summary of the activities of the geologists.

Through the appointment of 21 geologists under the Emergency Conservation Work organization it was possible to work out programs for the preservation of the geological features of the national parks and monuments; to prepare descriptive material and make recommendations for trail locations which will lead to the appreciation of these features by the public; and to furnish technical advice concerning problems of economic and engineering geology pertaining to the emergency program.

An outstanding result of the work of these geologists was the preparation of 35 detailed geological reports on existing and proposed National and State park areas, 284 brief summaries of the geology of such areas, and 60 reports on specific developmental projects.

Among the notable achievements of geologists on the Service staff not previously reported were the following:

1. Excavation project at Fossil Cycad National Monument, revealing the presence of hundreds of specimens in place, justifying the retention of the area by the Federal Government as part of the national park and monument system.

2. Discovery of a new habitat of prehistoric man in the Longhorn Caverns State Park, Tex.

3. Excavation, under the guidance of geologists of the National Park Service, of fossil dinosaur skeletons at the Dinosaur National Monument. This exhibit, when completed, will not only show the bones in place but will contain reconstructions of these ancient monsters.

4. Discovery at the Petrified Forest National Monument of a stump and root system, about 15 feet in length, of a petrified tree entombed in a vertical position with leaves and cycad cones buried at its base. This, together with smaller samples unearthed, indicates that some of the trees grew within the boundaries of the present national monument, contrary to the older theory of growth elsewhere and drift.
5. Development of fossil exhibits on the Kaibab and Bright Angel Trails in the Grand Canyon, showing examples of extinct plants and animals in situ.

6. Display of fossil ginkgo trees, found entombed in lava flows of the Northwest.

7. Formation of a policy regarding cave development designed to prevent overdevelopment and consequent injury to cavern features of the parks.

8. Accumulation of geological evidence, which will be submerged by completion of Boulder Lake, for museum display.


10. Preparation of 6 reels of talking motion pictures illustrating general geological processes, and 10 relief models showing the glacial history of New York State, and collection of geological specimens for museum and trail side display.

New discoveries of geological data are being constantly made, the full value of which can be determined only as investigations proceed. (59)

**Forest Protection**

The third major phase of natural resources management during the 1930s was forest protection. In April of 1933, John Coffman, Chief Forester, was brought to the Washington office to assist in organizing the Service's participation in the Emergency Conservation Work. In November of 1933, Coffman's functions as forester were removed from the Branch of Research and Education and upgraded into a Branch of Forestry (188). Perhaps this was done in anticipation of the extensive forest management projects that the CCC men would be completing. When Coffman moved to Washington, Lawrence Cook, Chief Ranger of Sequoia National Park, was named as Assistant Chief Forester and was stationed in Berkeley, California (142). The new Branch focused on fire protection, insect control, forest disease control, plantings and nursery operations, tree preservation and repair and vegetative mapping (94).
Walter Harold Horning joined Coffman's Washington staff as an assistant as did John F. Shanklin (June 21, 1933) and Fred H. Arnold (August 7, 1933). On August 21, 1933, Frank L. Ahern was hired as a fire protection engineer. This marked the beginning of the Service's safety and loss control program. (142)

At the January 1936 regionalization meetings in Washington, D. C., Chief Forester Coffman recommended the Branch of Forestry be changed in name to the Branch of Protection to be representative of all the protection functions of the ranger organization. He proposed Divisions within the Branch of Protection for Forest Protection (Eastern and Western Divisions), Building Fire Protection and Safety, a Wildlife Division, a Grazing Division and a Branch Training Officer.... His suggestion was not approved and the wildlife and grazing functions were omitted from his Branch which was still called the Branch of Forestry. (185)

By 1937, four regional foresters had been selected (Fred Arnold - Region 1; Frank W. Childs - Region 2; William H. Wirt - Region 3; Lawrence F. Cook - Region 4) and Eastern and Western Divisions of the Branch were operating. Theodore B. Plair was responsible for forestry activities and Donald Deleon was charged with forest entomology in the Western Division. Both worked out of Berkeley. (142,185)

In keeping with a philosophy encouraged by Stephen Mather, the Branch of Forestry entered into several cooperative agreements with other federal agencies to extend the pool of expertise available to resolve park problems without enlarging the Washington Office. One of those agreements was with the Division of Plant Disease Control, Bureau of Entomology. The focus of this agreement was on White Pine Blister Rust control. NPS control efforts were coordinated in the west by S. N. Wyckoff and by the
Washington office in the east. The second agreement was with the Bureau of Plant Industry. Dr. Emilio P. Meinecke, a pathologist with that Bureau, worked very closely with the Branch of Forestry. In 1934, he prepared a paper titled "Forest Problems in Eastern National Parks" in which he called attention to road and trail erosion problems, the expansion of heavy use zones, chestnut blight, removal of too many snags and problems surrounding camp ground management (24).

An exhaustive description of the activities of the Branch is found in a Departmental publication titled "Forest Conservation on Lands Administered by the Department of the Interior" (85). Two programs which should be highlighted at this point are the tree preservation crews and fire management. Funds and manpower provided by the CCC allowed the designation of tree crews which toured the parks and pruned and cabled numerous trees in national cemeteries and historic sites. They also acquired spray apparatus and provided protection to trees in historic sites and visitor use areas. Although the original tree crews were abandoned when the CCC program expired, the National Capital Region re-established several such crews in individual park areas (60).

In 1927, an interagency Forest Protection Board was established, with the National Park Service as an integral participant. By 1929, the Forest Protection Board had prepared a comprehensive national fire prevention plan.

The Forest Protection Board itself could not put its new plans for the Park Service into effect, but the CCC could. In 1933 Coffman became chief forester of a new
Branch of Forestry and assumed charge of the Emergency Conservation Work program. With the national fire plan as a blueprint, New Deal conservation programs gave the parks their first overhaul since the days of Army and Forest Service occupation. The liberation of money and manpower intoxicated the NPS as it had the Forest Service: it inflated the organization terrifically. In 1929 the permanent fire organization of the Park Service had consisted of one national fire officer, a special fire organization at Glacier, and a fire guard at Sequoia. Fire duties otherwise remained ancillary to visitor related responsibilities and general maintenance. Ten years later the fire facilities of the parks were more or less on a par with those of the national forests. Some 650 camps of 100 men each were stationed on park lands. Logistical support and administrative services required the Park Service to hire more than 7,000 employees - a figure not exceeded even in the early 1970s.

In preparing its plan for the national park system, the Forest Protection Board reasoned that the parks were "an economic service in the form of national education and recreation of value probably already even greater than an equivalent area of the choicest commercial forest'. The duty of the Park Service 'as custodian is to preserve, unmarred by fire or other agency of destruction, the picture dedicated to public use and placed in its charge.'...

... By allowing recreationists into the backcountry, the Park Service was augmenting the fire hazard; 'the conflict of objectives between preservation of natural wilderness areas free from roads, trails, structures and facilities, and the need for prompt action on all fires, creates a problem of relative values'. That is, fire control was a means of regulating the impact of visitors, and in the days before aircraft, fire control demanded certain encroachments of its own.

... An article published in American Forests in 1929 opened with [this] sentiment: 'Fire is today, without a doubt, the greatest threat against the perpetual scenic wealth of our largest national parks, which, bereft of their trees and foliage, would become haunts only of those interested in the study of desolation'.... Not until the concept of preservation changed its emphasis from the products of nature to the processes of nature was the imperative for fire protection diminished. Until the 1960s virtually every advocate of wilderness and every director of the Park Service demanded a strong fire program....

All of these values were incorporated into the strategy of CCC employment. The North Rim of Grand Canyon National Park is a good illustration of what resulted. During the summer months two or three camps operated on the North Rim and were relocated to the South Rim or the
Inner Canyon during the winter. The residence houses, warehouses, maintenance shops, and fire cache (for both structural and forest fires) were all constructed by CCC labor. Main roads were improved and primitive roads punched to remote sites. One permanent metal lookout was moved to a better location and a second constructed. An auxiliary network of tree towers, complete with metal scaling ladders, was erected. Telephone wires joined camps, cache, and command post. Water holes were created, both for wildlife and for fire control. Roadside fire hazards were cleaned up. And, of course, CCC crews were dispatched to fires. The facilities for fire management on the North Rim today are essentially those bequeathed by the CCC. A summer crew lives in the same houses, operates out of the same cache, and uses the same roads and towers. (194)

Roughly between 1929 and 1939, the Service developed interesting trends in fire management. During this period, the amount of acreage requiring fire protection and the commitment of the agency, in terms of equipment and manpower, increased steadily (Figure 5). At the same time, the total number of fires and specifically, the number of man caused fires also increased while the total acreage consumed by fire decreased (Figure 4).

Other accomplishments of the Branch included the preparation of "large-scale panoramic photographs" from fire lookouts and the completion of vegetation cover maps for all western parks by 1936. Collection of plant specimens coincided with the mapping project. (20)

Examination of the written record from these early years of the Branch of Forestry left the author with the overwhelming feeling that John Coffman and his co-workers were meticulous and carried organization to an extreme. All of their publications are complete and well structured, all of the "Director's Annual Reports" contained information on forest protection while other
Figure 5

FIRE PROTECTION EXPENDITURES
AND
ACREAGES

resources management activities seemed to receive less space or no space and, finally, the Branch expanded its interests far beyond pure forestry to include structural fire protection, campground and trail maintenance and exotic plant control. This would have a profound influence on the future of the Branch and the natural resources management function.

Land Acquisition by Donation and the Recreation Demonstration Areas

During the 1930s, Conrad Wirth, a future Director of the Service, rose to a position of great influence and contributed a great deal in the field of land management. The acquisition of real estate would become increasingly significant as a resource protection tool during the fifty year period between 1930 and 1980. The precedents set during the 1930s would remain for years to come.

As a result of a study authorized by Congress February 21, 1925, to look into the possibility of national parks in the eastern part of the United States, Great Smoky Mountains National Park in North Carolina and Tennessee, Shenandoah National Park, in Virginia, and Mammoth Cave National Park, in Kentucky, received congressional authorization in 1926....

All three of these areas required a great amount of negotiation and public relations work. Shenandoah involved the acquisition of over 193,500 acres, and Great Smoky involved over 500,000 acres divided fairly evenly between North Carolina and Tennessee. Associate Director Cammerer spent a great part of his time on these projects.... As head of the Branch of Lands, I worked closely with Cammerer in carrying out these projects. He was the top man, and I was his "leg man". He personally handled most of the negotiations, even after he became director in 1933.

The Branch of Lands had a nearly continuous job of reviewing and changing the boundary lines of Great Smoky, Shenandoah, and Mammoth Cave national parks.
largely as a result of poor surveys and maps. The Shenandoah map was in three sections, and we could not get them on our drafting tables. We would spend Saturdays and Sundays with these maps stretched on the floor in the hall in the Interior Building trying to get them in shape for court and fieldwork. (203)

Sizable donations had been made in the early years of the Service for such things as park land and roads. It was assumed that such donations would continue and there was a need for an agency to accept and care for such donations. Thus:

The Act of July 10, 1935 (49 Stat. 477) created a National Park Trust Board composed of the Secretary of the Interior, Secretary of the Treasury, Director of the National Park Service and two persons appointed by the President for a term of five years each. The Board was "... authorized to accept, receive, hold, and administer such gifts and bequests of personal property for the benefit of, or in conjunction with, the National Park Service, its activities, or its service as may be approved by the Board..."

The Act did not prohibit, however, the Secretary of the Interior from accepting, for the United States, gifts or bequests of money for immediate disbursement or other property in the interest of the National Park Service, its activities, or its service as authorized by law. (146)

The reader will recall that Wirth was appointed as Assistant Director in charge of the Branch of Lands (Planning) during Albright's administration. This Branch made very important contributions in terms of planning for the activities of the CCC. One of the most significant efforts of this Branch was the planning done in connection with the Recreational Demonstration Areas.

In the spring of 1933, President Roosevelt authorized the federal government agencies to cooperate with the states in the development of regional recreational areas. In January 1934 Park Service officials held a conference with state park officials to discuss the expansion of recreational facilities in state park areas. This conference helped establish the agenda and
regulations for the ECW in state park areas. The NPS became further involved in recreational issues when the president in June 1934 established the National Resource Board and the Park Service was assigned the task of assembling information on recreational needs for the entire country. The results of this research were to be used in establishing recreational demonstration areas submarginal lands purchased with Federal Emergency Relief Administration funds and developed by the ECW under the direction of the National Park Service.

... The majority of these areas were to become state, county, or city parks, with a few considered for retention by the federal government. The philosophy behind the recreational demonstration projects was to provide outdoor recreation for low income groups. 

... The Department of the Interior next sought permission to assume land acquisition authority, which was granted by executive order on November 14, 1936.

... The work involved in recreational demonstration areas included conservation of water, soil, forests, and wildlife resources, and creation of public recreational facilities such as roads, trails, dams, cabins, park structures, swimming pools, and picnicking and camping facilities. (193)

The state park movement was given a strong push by President Roosevelt when he created the National Resources Board by Executive Order of June 30, 1934, to study the problem of natural resources, including national and state parks and related recreational activities. To prepare the report, the recreational division of the board was set up in the Park Service with George M. Wright, Chief of the Wildlife Division, as director, and Herbert Evison, Supervisor of State Park Emergency Conservation Work, as assistant director. (187)

In 1934 and 1935 the National Park Service, using its regionalization setup for handling state park work, launched a study of the seashores along the Atlantic coast and the Gulf of Mexico.... The study was broken down into several parts but had two main emphases: first, those areas of outstanding importance from the national standpoint that might be considered as additions to the national park system, and second, those that were outstanding from the state standpoint and that were needed primarily for active recreation purposes. Shortly after the study was started it was felt that, though the Atlantic and Gulf shorelines were in the greatest danger and in need of protection, the study should be extended to include the Pacific coast as well. This was done approximately six months later.

These studies resulted in the selection of about
fifteen areas for possible inclusion in the national park system, and about thirty areas for state park systems, although our proposals were not developed to a stage that justified funding. (203)

Subsequent to these studies, the Park, Parkway and Recreational Area Study Act was developed and Cape Hatteras and Cape Cod National Seashores were established.

The Cape Hatteras and Cape Cod national seashores opened up a whole new phase of conservation. And Cape Cod is a real landmark in that it set a precedent where by it is now a policy of Congress to provide funds for the purchase of land needed for the national park system. The seashore conservation studies were the fore-runners of the policy preserving shorelines of various bodies of water, including our free flowing rivers. (203)

Summary

The natural resources management program of the Service, although not recognized as a comprehensive program, had finally come of age and was receiving the funding and manpower that was desperately needed to protect park resources. During a high water mark, the central office consisted of the positions and individuals shown on Figure 6. Once regionalization of the agency was firmly established regional foresters, geologists, and wildlife technicians were appointed. Some of the personnel originally assigned to the central office moved to those regional positions.

Field personnel were still sorely needed however. The first call for "wildlife rangers" came in 1933 from George Wright (121). Finally in 1938, Joseph Dixon was able to make the following comment:

The National Park Service has taken steps to have a "wildlife' ranger appointed in each national park, whose
Branch of Research and Education  
Assistant Director - Dr. Harold Bryant

Staff Assistant - Dr. Wallace Atwood

Naturalist Division  
Chief - Earl Trager  
Assistant Chief - H.E. Rothrock  
Associate Geologist - Franklin C. Potter  
Assistant Geologist - Harold H. Hawkins  
Geologist - C.H. Wegermann

Museum Division  
Chief - Carl P. Russell

Wildlife Division  
Chief - George M. Wright (Victor Cahalane)  
Assistant Chief - Ben Thompson (Joseph Dixon)  
Wildlife Biologist - Adolph Murie  
Wildlife Biologist - E. Lowell Sumner  
Supervisor of Fish Resources - David Madsen  
Assistant Wildlife Technician - E.L. Green

Branch of Forestry  
Chief - John D. Coffman  
Assistant Chief - Lawrence Cook  
Forester - Walter H. Horning  
Forester - John F. Shanklin  
Forester - Fred H. Arnold  
Fire Protection Engineer - Frank L. Ahern

Branch of Lands  
Chief - Conrad L. Wirth

Figure 6

NATURAL RESOURCES MANAGEMENT  
ORGANIZATION  
1936

Sources: Conservation History File, National Park Service Archives, Harpers Ferry, West Virginia.  
Forestry File, National Park Service Archives, Harpers Ferry, West Virginia.  
Management Biology File, National Park Service Archives, Harpers Ferry, West Virginia.
primary duty is to keep the Park Superintendent and the Wildlife Division informed as to plant, fish and all other wildlife conditions in that park. (21)

Threats Continue

The latter portion of Cammerer's administration saw the unfolding of a pattern of attempts to violate the integrity of the parks. Hetch Hetchy symbolizes the beginning of the trend; followed by partially successful raids during World War I. By 1920, the situation had become serious enough for the Director to issue a statement on the "Crisis in Conservation". Arno Cammerer was still plagued with "threats" twenty years later.

Glacier Bay National Monument had been established on February 25, 1925. Just over ten years later, it was legislatively opened to mineral development. This move was consistent with actions at Mount McKinley during the previous decade. The following comment made by Roosevelt reveals an attitude held about mineral extraction in national park units.

No injury can be done to anyone or anything.... Any scars on the face of nature would be infinitesimal in comparison with the magnitude and grandeur of the national monument. (191)

Similar legislation would open Organ Pipe Cactus National Monument to mining on October 27, 1941.

Once again, irrigationists wanted to build a dam in Yellowstone but they were unsuccessful. Irrigation and power interests also sought and received approval to construct a water tunnel through Rocky Mountain National Park. (187)
Insight into the breadth of the contributions of the CCC to the Service's resource protection efforts is best illustrated by a statement from Franklin Roosevelt.

Hundreds of miles of firebreaks have been built, fire hazards have been reduced on great tracts of timberland, thousands of miles of roadside have been cleared, 2,500 miles of trails have been constructed and 10,000 acres have been reforested. Other tens of thousands of acres have been treated for tree disease and soil erosion. (191)

Other activities included such things as seed collection, lookout tower construction, and fish stocking (Table 1).

Unfortunately the pace initiated by the emergency employment programs dropped off drastically during 1939. The approach of World War II altered national priorities and reduced the need for employment activities. Many of the biological, geological and forestry positions were left vacant. In November of 1939, the remnants of the Wildlife Division were transferred to the Bureau of Biological Survey and the Bureau of Fisheries. This transfer came as a result of a Departmental reorganization initiated by President Roosevelt. Cahalane fought the transfer and submitted a letter to the Director expressing his concern over the potential changes (98). Despite Cahalane's concern over the transfer, it was effected in December of 1939. The Division was established as a Section on National Park Wildlife of the Survey's Division of Wildlife Research. Victor Cahalane, Joseph Dixon, E. Lowell Sumner and Adolph Murie were the only wildlife biologists who survived the cutbacks and were the individuals
Table 1

SELECTED NATURAL RESOURCE PROJECTS
ACCOMPLISHED BY THE
CIVILIAN CONSERVATION CORPS
(1933 - 1941)

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>UNITS</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firebreaks</td>
<td>miles</td>
<td>503.6</td>
</tr>
<tr>
<td>Lookout Towers</td>
<td>number</td>
<td>48</td>
</tr>
<tr>
<td>Fighting Forest Fires</td>
<td>man days</td>
<td>239,616</td>
</tr>
<tr>
<td>Nursery Operation</td>
<td>man days</td>
<td>139,053</td>
</tr>
<tr>
<td>Range Re-vegetation</td>
<td>acres</td>
<td>866</td>
</tr>
<tr>
<td>Seed Collection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Conifers</td>
<td>bushels</td>
<td>836</td>
</tr>
<tr>
<td>(b) Hardwoods</td>
<td>pounds</td>
<td>75,038</td>
</tr>
<tr>
<td>(c) Flowers, Grasses</td>
<td>pounds</td>
<td>6,605</td>
</tr>
<tr>
<td>Tree Insect Control</td>
<td>acres</td>
<td>424,069.6</td>
</tr>
<tr>
<td>Tree Disease Control</td>
<td>acres</td>
<td>131,055.8</td>
</tr>
<tr>
<td>Eradication of Poisonous Plants</td>
<td>acres</td>
<td>12,483.4</td>
</tr>
<tr>
<td>Erosion Control - Bank Protection</td>
<td>sq. yds.</td>
<td>1,359,355</td>
</tr>
<tr>
<td>Treatment of Gullies</td>
<td>acres</td>
<td>12,380.5</td>
</tr>
<tr>
<td>Seeding and Sodding</td>
<td>sq. yds.</td>
<td>4,227,736</td>
</tr>
<tr>
<td>Vista Cutting</td>
<td>acres</td>
<td>2,890.6</td>
</tr>
<tr>
<td>Stocking Fish</td>
<td>number</td>
<td>10,326,115</td>
</tr>
<tr>
<td>Type Maps</td>
<td>man days</td>
<td>7,057</td>
</tr>
<tr>
<td>Other Wildlife Activities</td>
<td>man days</td>
<td>53,335</td>
</tr>
</tbody>
</table>

that formed this new Section (199). Supervisor of Fish Resources, David Madsen, and Assistant Wildlife Technician E. L. Green were transferred to the Bureau of Fisheries (99).

Fortunately, the Branch of Forestry remained more or less intact but the activities of the geologists dwindled. The record seems to indicate that at the close of the decade each region was left with a geologist, a forester, and a wildlife biologist.

**Policies**

Acceptance of the concepts outlined in Fauna No.1 was a major policy change and the first effort at delineating wildlife management policy separately from other policies. Many have commented that Wright was conceptually well ahead of his time (199,286). This is supported by the fact that both Yellowstone and Mount McKinley gave serious consideration to re-instituting predator control programs in 1937 and 1939 respectively.

The twenty wildlife policies shown on pages 147-8 of Fauna No. 1 as "suggested" were immediately adopted by the Service as official. Each biologist was provided with a copy of this publication for his guidance in overall policy and for application to many of the major biological maladjustments of his particular territory. It remained the working "bible" for all park biologists until after World War II, when it went out of print, was not reissued, and became largely unavailable and unknown to postwar generations of biologists and administrators. (199)

Following are those policies in their entirety:

1. That each park shall contain within itself the year round habitats of all species belonging to the native resident fauna.
2. That each park shall include sufficient areas in all these required habitats to maintain at least the minimum population of each species necessary to insure its perpetuation.
3. That park boundaries shall be drafted to follow natural faunal barriers, the limiting faunal zone, where possible.

4. That a complete report upon a new park project shall include a survey of the fauna as a critical factor in determining area and boundaries.

5. That no management measure or other interference with biotic relationships shall be undertaken prior to a properly conducted investigation.

6. That every species shall be left to carry on its struggle for existence unaided, as being to its greatest ultimate good, unless there is real cause to believe that it will perish if unassisted.

7. That, where artificial feeding, control of natural enemies, or other protective measures, are necessary to save a species that is unable to cope with civilization's influences, every effort shall be made to place that species on a self sustaining basis once more; whence these artificial aids, which themselves have unfortunate consequences, will no longer be needed.

8. That the rare predators shall be considered special charges of the national parks in proportion that they are persecuted everywhere else.

9. That no native predator shall be destroyed on account of its normal utilization of any other park animal, excepting if that animal is in immediate danger of extermination, and then only if the predator is not itself a vanishing form.

10. That species predatory upon fish shall be allowed to continue in normal numbers and to share normally in the benefits of fish culture.

11. That the numbers of native ungulates occupying a deteriorated range shall not be permitted to exceed its reduced carrying capacity and, preferably, shall be kept below the carrying capacity at every step until the range can be brought back to original productiveness.

12. That any native species which has been exterminated from the park area shall be brought back if this can be done, but if said species has become extinct no related form shall be considered a candidate for reintroduction in its place.

13. That any exotic species which has already become established in a park shall be either eliminated or held to a minimum provided complete eradication is not feasible.

14. That the threatening invasion of the parks by other exotics shall be anticipated; and to this end, since it is more a local problem, encouragement shall be given for national and state cooperation in the creation of a board which will regulate the transplanting of all wild species.

15. That presentation of the animal life of the parks to the public shall be a wholly natural one.
16. That no animal shall be encouraged to become dependent upon man for its support.

17. That problems of injury to persons of visitors or to their property or to the special interests of man in the park, shall be solved by methods other than those involving the killing or interfering with their normal relationships, where this is at all practicable.

18. That a complete faunal investigation, including the four steps determining the primitive faunal picture, tracing the history of human influences, making a thorough zoological survey and formulating a wild life administrative plan, shall be made in each park at the earliest possible date.

19. That the local park museum in each case shall be repository for a complete study skin collection of the area and for accumulated evidence attesting to original wild life conditions.

20. That each park shall develop within the ranger department a personnel of one or more men trained in the handling of wild life problems, and who will be assisted by the field staff appointed to carry out the faunal program of the Service. (121)

In 1936, the Service issued its first formal policy statement on park fisheries. David Madsen, Supervisor of Fish Resources, provided this commentary on that policy in 1938:

In reviewing the history of the National Park Service, we are confronted with the fact that our policy with reference to fish and fishing has, until recently, been entirely inconsistent with our policy regarding every other form of wildlife in the national parks. If we had followed the same policy with reference to wild animals in the national parks that we have followed with our fish stocking program, we would probably have the red deer of Europe intermingling with the mule deer of the Kaibab; we would have mountain goats in the Tetons, Chinese pheasants in Yosemite and so on. Conditions similar to these have actually taken place in our fish planting program. We probably have no less than 20 to 30 non-native species of fish permanently established in national park waters. There is not a national park where fishing is important that has not been subjected, in a greater or lesser degree, to this violation of national park policies.

Since we have encouraged fishing in the national parks and the resultant program of fish hatcheries and fish planting in order to maintain good fishing it does seem our definite duty to predicate that policy upon the theory that we will, insofar as possible, protect the native species of fish in the national parks. With this
definite purpose in mind, we have developed, and there has been approved by the Director, a definite fish planting policy. This policy has for its purpose the protection for all time of such national park waters, as are not already contaminated, against the introduction of non-native species. As a result of this policy it is our belief that there will always be lakes and a few streams in the national parks that will remain natural insofar as aquatic life is concerned. The policy further states that in waters where non-native fish now exist with the native species, the latter will be favored in every instance to the fullest possible extent. The policy further provides that no agency, Federal or state, shall in the future be permitted to plant fish in any national park except with the approval and under the direction of regular National Park employees. The policy further provides that no aquatic vegetation of any kind shall be introduced into the park waters for the purpose of improving fishing. The whole purpose of the policy is to give the National Park Service complete control over the aquatic life in the parks in the same manner as it controls other forms of animal life. The Service also supports the trend away from the use of natural baits, and whenever possible regulations are drawn permitting only the taking of fish by artificial lures.

While this policy is only slightly more than two years old, it has been enthusiastically accepted by the general staff and by the various Superintendents, as well as the American Fisheries Society. The necessity for the strict application of such a policy is apparent from what has already been said. Much more emphasis might well be placed upon its importance.

It does not seem reasonable that, since we have already wrought such havoc because of our lack of planning and study, we should, insofar as possible, protect the waters under our supervision against the same mistakes in the future. The National Park Service has a great opportunity and responsibility for preserving and in some instances restoring the normal relationship between all forms of aquatic life, including fish.

While we are, and I think we shall be, compelled to operate fish hatcheries and maintain reasonably good fishing in the national parks, we should keep constantly in mind the fact that insofar as possible it is our plain duty to maintain the parks in their natural and primitive conditions. To accomplish this we must have complete control over every activity which has to do in any way with changing the natural biological balance in national park waters. (21)

As with the wildlife policies formulated by George Wright, those
developed by Madsen represented significant improvements over previous years.

Unfortunately, the manifestation of sound ecological management through appropriate policies was not universal among the various resource management activities. Fish were still exploited and fish culture was acceptable. Forest management was regarded as forest protection in the truest sense of the word.

Extracts from the 1940 publication titled "Forest Conservation on Areas Administered by the Department of the Interior" provide a clear understanding of the forestry policies:

When the Congress created the National Park Service to administer these areas it very definitely decreed that they should be conserved "... in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.' In accordance with this mandate every effort is made to maintain the forests in their natural condition.

In accordance with this policy no commercial timber operations are permitted within the national parks and monuments. Protection of the forests against destructive insect epidemics sometimes necessitates the cutting and treatment of insect infested trees. Provision for such protection is included in the act which established the National Park Service and prescribed its duties. A very restricted form of fire hazard reduction is likewise necessary along some of the park roads and trails in order to minimize the fire danger resulting from the use of the area by the public. The fuel wood necessary for the use of campers, park operators, and of the National Park Service itself and such construction timbers as may be required are obtained so far as possible from clearings for roads and other physical improvements, insect control and fire hazard reduction projects, or from trees killed by fire or insects, but in every case special precautions are taken to preserve the scenic aspects of the area and to protect the interests of the wildlife and other values therein.

It is the policy of the Service to make no compromise with fire, and the rule is that every fire shall be reached and extinguished as quickly as possible. Fire suppression takes precedence over all other park activities except the saving or safeguarding of human life.
Forest insects and diseases may, and often do, become extremely destructive to the vegetation and therefore to important park values. They recognize no artificial boundaries, no outstanding scenic or recreational area, nor do they pass by specimen trees of unique or outstanding aesthetic or public values. It must be recognized that forest insects and most diseases cannot be completely eliminated. However, they can be controlled without sacrificing the major park values to the extent that those values would be lost if no control were attempted. (85)

The "Manual of the Branch of Forestry", which was released a second time in 1938, provides the following information on policy related to forest entomology:

In keeping with the mandate of Congress that the national parks are maintained in their natural condition so far as consistent with public use and enjoyment, it will be the aim of the Branch of Forestry ... to retain the primeval and natural forest conditions so far as use and safety of the forest will permit....

It will be the policy to procure and maintain so far as practicable efficient protection from insect epidemics ... (95)

A brochure outlining the forest management activities of the CCC provides the following additional insight into forestry in the NPS:

Forested areas in these reservations must be kept in their natural condition so far as possible. The removal of underbrush, dead trees, windfalls, and other natural debris from old forests is undertaken only to such an extent as is necessary to remove serious fire hazards. Ground cover is essential in the complete protection of bird life and small mammals, and also is part of the natural forest scene. Timber cutting is undertaken only when it is designed to improve the quality of young growth on cut over or burned over lands. (32)

The fallacies of complete forest protection from fire, disease and insects and stand improvement are eased somewhat when it is recognized that general professional opinion of that time condoned these practices. It should also be recognized that many
benefits were derived from this intensive forest management including the development of a sophisticated fire suppression organization, serious control of some exotic species, protection of significant individual trees, and the recognition of a relationship between developed areas maintenance and the natural resources in these areas (85).

**Cammerer's Resignation**

The tremendous strain caused by the Service's activities between 1933 and 1940 resulted in the Director Cammerer's development of heart problems forcing his resignation on August 9, 1940. He assumed the Regional Directorship in Richmond, Virginia but died on April 30, 1941. (187)

His death was a tremendous loss for the Service. Examination of the Service's progress in the management of natural resources alone is testimony enough of the great service he provided in the preservation to the National Park System.

Fortunately the leadership of the agency would pass to another competent individual.
Newton B. Drury became Director upon Cammerer's resignation. Drury had been the Executive Secretary of the Save the Redwoods League and had served on the California State Park Commission. John Ise has described him as being:

"... well and broadly educated, conscientious, indefatigably devoted to the parks, and courageous and stubborn in defending them. Probably he was a little more sympathetic with the purist view of park management than any of the other Directors...." (187)

These traits would prove invaluable during Drury's administration.

When Drury took charge of the agency it was under generally favorable conditions. Visitation to the parks was up, the agency budget was in reasonable shape and some relief programs were still being funded. However, these conditions would be short lived. On December 7, 1941 the country entered World War II. Appropriations to the Service were cut drastically, gasoline rationing reduced visitation, CCC camps were closed and the number of permanent Service employees was cut in half. To make matters worse, the Service's central offices were moved to Chicago in August of 1942. Associate Director Arthur Demaray was left in Washington to supervise a small liaison office. Despite these obstacles and numerous attempts to raid the resources of
the parks during the war, Drury was able to persevere and hold the System together.

Legislation

Despite the war, park units continued to be added to the System, albeit, with far less rapidity than the decade prior. Mammoth Cave was established on July 1, 1941 and Grand Teton National Monument was created by presidential proclamation on March 15, 1943.

The Bald and Golden Eagle Protection Act was signed into law in 1940 and, in 1946, Congress passed an Act which authorized use of appropriations for the cooperative administration of recreational areas under the jurisdiction of other Federal agencies. This opened the door to cooperative endeavors with the Bureau of Reclamation. This also authorized use of funds to perfect and protect water rights necessary for park management.

Organization and Programs

The war effort resulted in a rather lack lustre natural resources management program within the Service; lack lustre in comparison to the previous ten years. Undoubtedly, it is just as well that the program took a more subdued profile in light of the very serious attacks on park resources which threatened their very integrity.

Wildlife Biology

Vic Cahalane continued to function as a wildlife biologist for the Service but, he was assigned to the National Park Wildlife
Section of the former Bureau of Biological Survey (after 1940 the name of that agency was changed to the Fish and Wildlife Service). In 1944 Cahalane was transferred back to the National Park Service and served for most of the remainder of the decade as the sole wildlife biologist in the Washington office. (63)

By 1947, a Branch of Natural History had been created. That Branch included a Chief, Biology Division (Vic Cahalane held this position); an Assistant Chief, Biology Division; and a Chief, Geology Division. The field offices were represented by Regional Biologists in Regions Two and Four, Park Biologists at Yellowstone and Mount McKinley National Parks and a Volcanologist and Geologist at Hawaii National Park. (156) By 1950, this Branch became known as the Division of Natural History. It is reasonable to assume that all other biological and geological positions were lost to the war effort. No record is readily available which documents the loss of the fishery biologists which were transferred to the Bureau of Fisheries. They were, probably, also abolished as a result of the war. The positions of Regional Wildlife Biologists remained in tact at least for the first few years of the war.

During the forties, the biological program was successful in publishing a series of annual reports which outlined the conditions of wildlife in the national parks. Those reports appeared in 1939, 1941, 1947, 1949, 1950 and 1951 (reports may have been prepared for other years but no record of them was found) (151).

In addition, Cahalane kept a steady flow of professional
papers in print. One of his most significant literary contributions was his co-authorship of *Fading Trails, the Story of Endangered American Wildlife*. (3) This was the first comprehensive treatise on endangered species in North America. Cahalane was not alone in his publishing efforts. In 1940, Number 4 in the Fauna Series was published (*Ecology of the Coyote in Yellowstone*) and, in 1944, Number 5 (*The Wolves of Mount McKinley*). By 1947, a new series of interpretive handbooks on the parks had been established. Most of the booklets prepared for this series focused on historical areas but during the late 1940s and early 1950s a handful of titles on natural areas was produced.

Unlike the previous decade, the 1940s saw little beyond a mere struggle to hang on in terms of servicewide wildlife programs.

The Service was still plagued with a host of wildlife problems. There was, for instance, the problem of the relation of predators to the Dall Sheep in Mount McKinley. The sheep seemed not to be doing well, and there was suspicion that the wolves were killing too many; but some naturalists believed that the trouble was mostly something else, and a careful study by Adolph Murie tended to show that the wolves were not the main cause of the decline in sheep populations. Mountain sheep in Rocky Mountain, Death Valley, and Joshua Tree also called for study. Many of them were at times thin and mangy, and the problem was what caused this? In Death Valley and Grand Canyon an overpopulation of burros proved difficult to overcome, and in Yellowstone the surplus of elk and bison continued unabated, in spite of efforts of the Park Service to secure a reduction. During much of this period Zion was plagued with a great surplus of mule deer which was little affected by hunting outside the park. The canyon was fine, sheltered wintering ground, largely free from predators, and the deer did not venture out much, with the result that they multiplied to a point where they destroyed much of the food plants, while deer themselves suffered grave deterioration. In 1944 park rangers in cooperation with the Utah State Department of Fish and Game, killed 300
of them, but the forage in the canyon did not recover for years.

In Rocky Mountain a similar situation developed. There the elk and deer had been heavily overgrazing the forage for years. They were restricted to the higher elevations by domestic livestock which used the lower pastures. The Park Service finally, in the winter of 1943-44, planned a reduction of one third - 200 deer and 300 elk - but managed to kill only 12 elk and 14 deer. One of the problems in Rocky Mountain was the deer - beaver relationship - the deer killed aspens which the beaver needed, and vice versa.

For some time the Park Service policy had been to permit each species of wildlife to carry on its struggle for existence without artificial help, in the belief that this would ultimately be good for the species and conform to the purpose of the parks, although if a particular species appeared to be on the point of extinction it might be given help by control of predators, artificial feeding, treatment for diseases, or whatever proved necessary. One difficulty often encountered was that distress for one species might mean trouble for another. In Yellowstone, for instance, a persistent surplus of elk sometimes meant starvation for the elk and depletion of the forage for both elk and antelope, with the antelope threatened with extinction. (187)

Forestry

The story of the Branch of Forestry is somewhat different. Forest management activities continued as before the war, although numerous cutbacks in programs were experienced because of the loss of CCC labor. Undoubtedly, the ability of the forestry program to hang on was related to the close association of forest protection with the war effort. Maintenance of healthy forests was in keeping with maintaining a sound nation and fire suppression was considered to be an integral element of national defense. The Branch may have also survived as a result of the outstanding organizational skills of John Coffman.

As with the Regional Biologists, the Regional Foresters continued to function during the 1940s. Fire control remained a
top priority and forest insect and disease control efforts continued on a limited basis. CCC tree preservation crews were abolished in 1939 due to lack of funding but, during the 1940s, Region One established its own itinerant crew. Sometime late in the 1940s, the name of the Branch of Forestry was changed to the Division of Forestry.

Geology

Aside from the two geological staff positions at Hawaii National Park, mentioned previously, no documentation was found on the activities or organization of this group. Originally these positions were funded through the emergency conservation programs. It is reasonable to assume that these positions were lost as the emergency programs were abandoned. The Service apparently never re-established the positions with agency operating funds.

Soil and Moisture Conservation

On July 1, 1940, the functions of the Soil Conservation Service, U.S. Department of Agriculture, which affected land under the jurisdiction of the Department of the Interior, were transferred to the Office of Land Utilization within the Department of the Interior. Under this new organization, land management agencies within the Department were given funds for soil and moisture conservation projects of all types starting in fiscal year 1942. (30)

Immediately after the nation entered the war, emphasis was placed on conservation projects which would increase livestock
production and resolve adverse conditions associated with irrigation projects. It is not clear how extensively this program was utilized by the Service for resource protection. The 1942 "Annual Report of the Director" does, however, indicate involvement of the Service's engineering laboratory in conducting a variety of soil analyses (30). The "Director's Annual Report" from 1945 indicates that 9 units benefitted from the soil and moisture conservation funding (64). The 1948 report indicates that 15,000 willows were planted at Chaco Canyon and 45 acres were re-seeded at Kennesaw under the program.

Lands Management

The lands management program of the Service during this decade essentially consisted of an effort to eliminate inholdings in the parks. In addition, some recreation studies were completed for river basin projects.

Non federal lands in the national park and national monument areas still presented one of the greatest problems of the Park Service. There were about 600,000 acres of non federal lands in the park system - 150,000 acres owned by states, 150,000 by railroads, and 300,000 acres by several thousand private owners. The state lands were school lands, given to the states when they were admitted to the Union, and were a problem in twenty six areas, particularly Glacier, Carlsbad, Dinosaur, Great Sand Dunes, Joshua Tree, Saguaro, and White Sands....

The railroads had originally been granted a total of 190 million acres of public land to encourage railroad building, more than 500,000 acres of which were later included in national parks and monuments, chiefly Grand Canyon, Yellowstone, Bryce Canyon, Joshua Tree, Grand Canyon National Monument, Petrified Forest, and Wupatki. About 350,000 acres were released under the Transportation Act of 1940 leaving 150,000 acres, much of which was in Joshua Tree....

The personally owned lands, scattered among several thousand owners, were the worst nuisance, used in lot
subdivisions, as homesites, ranches, cabin sites, resorts, soft drink stands, and cafes, auto junk yards, sawmills, gravel pits, many of them eyesores....

Prior to the thirties, some funds were voted occasionally, conditioned on equal amounts being donated by private or other donors. Just before the Second World War Congress made several small grants for specific parcels and after the war $25,000 for Montezuma Well and, in 1947, $30,000 for George Washington Carver National Monument. About the end of the war the Park Service began to formulate definite plans for land acquisition, set up in its Lands Division a Real Estate Branch, to analyze all data regarding private lands. This analysis was fairly well completed by 1946, and priorities were set up for acquisition....

In the appropriation act of July 25, 1947, the first important general grant for land buying was made, of $200,000, $30,000 of which was to be used for lands for the George Washington Carver National Monument, and the rest for certain specified areas. This was a beginning, enough, as Drury said, to buy all the private lands in the parks in 100 to 150 years if prices did not rise. The next year another $200,000 was granted, to be used for certain specified parks, and in 1949 $300,000 was voted for private lands and Mammoth Cave the amount for Mammoth Cave not specified. (187)

Field Activities

The severe cutbacks in Service personnel during Drury's administration resulted in a drastic reduction in the number of field projects completed on all fronts of natural resources management. Almost all work which was accomplished was done on the park level. Some interesting facts from this period are that forest nurseries were in operation in Shenandoah, Great Smoky Mountains, Sequoia, and Yellowstone in 1941 (61); 1943 marked the first year of a human fatality from a bear incident in Yellowstone (62); wild turkeys were re-established at Mesa Verde in 1945 (64); in 1946, 14 bighorn sheep were introduced into Mesa Verde (65); Dutch elm disease was first noted in the National
Capital area in 1947 (66); and white tail deer were re-established at Mammoth Cave in 1948 (67).

The single most prevalent issue during this decade was the unbalanced condition of ungulate populations and their range in the parks. Once again, Yellowstone provides a representative case in point. Between 1889 and 1938, an extensive elk relocation program was undertaken at Yellowstone (Figure 7). Cahalane gave an excellent summary of the management on the Yellowstone elk herd in an address at the Eighth North American Wildlife Conference.

Within the protected park, shortage of winter forage approached a crisis in 1934. There were about 13,500 elk double the estimated carrying capacity. The most palatable plants were eaten to the verge of extinction. Their places were taken by less nutritious and, therefore, less sought after weeds. In many places erosion was widespread.

In 1934, the National Park Service determined to reduce the size of the northern elk herd. If hunting outside the park boundaries could not remove the surplus elk, animals would be live trapped within the park and shipped away for restocking purposes. If these measures proved ineffective, the final step - killing elk in the park - must be taken.

The plan to remove 3,000 elk annually until the carrying capacity of the winter range had been reached, received support of an impressive list of individuals and organizations prominent in the conservation field. Almost without exception they were convinced by historical facts and field data.

The elk reduction program as originally planned encountered a series of obstacles almost from its inception in 1934. Unusual weather conditions during several winters made it possible for the elk to remain on their normal summer and fall range within the park. As a result, the average annual hunting kill for the 8 years was only 1,758. Neither did reduction within the park come up to expectations. Ranges in the United States not already overstocked with wildlife and domestic animals were few, and a total of 1,730 live elk satisfied the demand during this period. An additional 617 elk were live trapped and slaughtered for food for Indians. White relief agencies, however, refused repeated
Figure 7

LIVE ELK SHIPMENTS FROM YELLOWSTONE NATIONAL PARK 1889-1938 INCLUSIVE

(○) INDICATES STATE CAPITAL WHEN EXACT DISTRIBUTION NOT RECORDED

offers of elk meat at cost.

During the eight winters from 1934 to 1942, the total number of elk removed from the northern Yellowstone herd within and outside the park was 16,682 — one third less than the number expected....

In the fall of 1942 the National Park Service and the Montana Game Commission took steps to effect an immediate and drastic reduction. It was decided to keep the hunting season open until the objective was achieved. Early deep snows and crustling conditions forced the greatest migration of elk from the park in many years. The national shortage of domestic meats, and possibly other factors, spurred a large number of hunters into the field. By January 14, 1943, when the hunting season was closed, 6,539 elk, including 75 irrecoverable animals estimated to have died of wounds, were shot. The official destruction of 691 elk within the park made a total of 7,230 eliminated from the northern herd.

... It was the first systematic program carried out in a United States national park to effect large scale reduction of surplus animals by efficient, practical methods. (159)

The tone of Cahalane's address indicates that the Service and the State of Montana were working jointly on the elk management program. By 1949, the story appears to have changed.

In Yellowstone National Park the increasingly serious problem is one of winter range for the great elk herd which frequents the northern part of the park. Herd reductions have not been sufficient to halt the depletion of the important browse species on which it relies for food. It is estimated that the elk will number 11,000 this fall and that the winter range will not support more that 5,000 if its condition is to have a chance to improve materially. Refusal of the Montana State Game Department to permit hunters to harvest enough elk north of the park leads only to the conclusion that, to save the remaining range and the associated wildlife, the Service itself will be forced to effect a drastic reduction. (68)

Fisheries management issues were also beginning to surface in 1949.

Two fishery problems are causing much concern. Because of the pressure of numbers, many popular fishing streams and lakes have been depleted of the larger fish, and anglers are dissatisfied. Stocking of legal sized
fish is highly expensive and is unsatisfactory in national park areas for several reasons. It is becoming apparent that, to protect the streams, angling pressure must be restricted within the rather limited natural carrying capacity of the mountain waters.

The second problem is that of overfishing by commercial interests in Florida Bay, much of which is ultimately to be part of Everglades National Park. Not only is future commercial and sport fishing endangered there by destructive methods of fishing; the food supply of many kinds of aquatic birds — ibises, herons, roseate spoonbills, cormorants, pelicans, and others — which are dependent on a continued supply of small fish and other aquatic life, is being seriously depleted. Florida Bay needs to be added to the park, and proper protective regulations established and enforced, at the earliest possible moment. (68)

Fish stocking had become extensive by the early 1940s (Table 2).

Research

The Wildlife Division had placed a good deal of emphasis on research in the 1930s. Although the number of professional investigations being conducted on parkland dwindled with the loss of the biological and geological staff, the research area program appears to have survived. An article by S. Charles Kendeigh on research areas in the national parks appeared in a 1942 issue of Ecology. That article described twenty eight such areas in ten different parks. (265) This program was underscored by a report issued by the Service in 1945 entitled "Research in the National Park System and Its Relation to Private Research and the Work of Research Foundations." This document called for a comprehensive approach to research with the following recommendations:

A. Continue and complete studies of all basic park resources with a view toward defining specific research needs for various areas, and integrating proposed research projects with administrative requirements.
### Table 2

**FISH PLANTING DATA — 1940 - 1941**

<table>
<thead>
<tr>
<th>AREA AND TOTAL ALL SPECIES</th>
<th>SPECIES</th>
<th>NUMBER PLANTED</th>
<th>EYED EGGS</th>
<th>FRY</th>
<th>FINGERLING UNDER 5 IN.</th>
<th>LARGER</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACADIA Mt. Desert Island exc. areas entirely w.tn-pr.,a<em>e lands</em></td>
<td>Smallmouth Bass</td>
<td>5,000</td>
<td>5,000</td>
<td>4,500</td>
<td>3</td>
<td>Turq. Broc. Me. S.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Landlocked Salmon</td>
<td>4,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Craig Broc. Me. F.</td>
</tr>
<tr>
<td></td>
<td>Rainbow Trout</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brook Trout</td>
<td>133,588</td>
<td>117,900</td>
<td>6,000</td>
<td>185</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRATER LAKE 20,000</td>
<td>Rainbow Trout</td>
<td>20,000</td>
<td>20,000</td>
<td></td>
<td></td>
<td></td>
<td>Butte F., Greg. F.</td>
</tr>
<tr>
<td>GLACIER 2,559,412</td>
<td>Blacksptott Trout</td>
<td>1,787,318</td>
<td>767,649</td>
<td>38,184</td>
<td></td>
<td>Jackson &amp; Yellowstone</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brook Trout</td>
<td>336,323</td>
<td>316,921</td>
<td>19,402</td>
<td></td>
<td>Park &amp; NPS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rainbow Trout</td>
<td>433,771</td>
<td>329,729</td>
<td>21,682</td>
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</tr>
<tr>
<td>GRAND CANYON 45,000</td>
<td>Rainbow Trout</td>
<td>45,000</td>
<td></td>
<td>66,000</td>
<td></td>
<td>Spring. Utah F.</td>
<td></td>
</tr>
<tr>
<td>GRAND TETON 1,040,645</td>
<td>Blacksptott Trout</td>
<td>974,645</td>
<td>187,685</td>
<td></td>
<td></td>
<td>Jackson &amp; Yellowstone</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brook Trout</td>
<td>786,960</td>
<td>66,000</td>
<td></td>
<td></td>
<td>Park &amp; NPS</td>
<td></td>
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<tr>
<td>GREAT SMOKY MTNS. 2,08,690</td>
<td>Brook Trout</td>
<td>95,115</td>
<td>70,859</td>
<td>24,256</td>
<td>63,925</td>
<td>F &amp; S hatcheries</td>
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<td></td>
<td>Rainbow Trout</td>
<td>113,575</td>
<td>49,770</td>
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<tr>
<td>ISLE ROYALE 14,000</td>
<td>Rainbow Trout</td>
<td>10,000</td>
<td>10,000</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Brook Trout</td>
<td>4,000</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>Brown Trout</td>
<td>4,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>KINGS CANYON 42,000</td>
<td>Rainbow Trout</td>
<td>42,000</td>
<td>42,000</td>
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<td></td>
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<tr>
<td>Lassen Volcanic 389,200</td>
<td>Loch Leven Trout</td>
<td>73,000</td>
<td>73,000</td>
<td></td>
<td></td>
<td>Surrey Creek &amp; Clear Creek, Calif.</td>
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<tr>
<td></td>
<td>Rainbow Trout</td>
<td>278,220</td>
<td>278,220</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Brook Trout</td>
<td>38,000</td>
<td></td>
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<tr>
<td>MOUNT RAINIER 585,000</td>
<td>Brook Trout</td>
<td>106,000</td>
<td>108,000</td>
<td></td>
<td></td>
<td>Birds v. Wash. F.</td>
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<tr>
<td></td>
<td>Blacksptott Trout</td>
<td>477,000</td>
<td>477,000</td>
<td></td>
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<tr>
<td>OLYMPIC 186,000</td>
<td>Blacksptott Trout</td>
<td>170,000</td>
<td>170,000</td>
<td></td>
<td></td>
<td>Quinn &amp; Wash. F.</td>
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</tr>
<tr>
<td></td>
<td>Rainbow Trout</td>
<td>16,000</td>
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<tr>
<td>ROCKY MOUNTAIN 146,100</td>
<td>Blacksptott Trout</td>
<td>146,100</td>
<td>136,100</td>
<td></td>
<td>10,000</td>
<td>Colorado &amp; Fish Comm. S.</td>
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<tr>
<td></td>
<td>Brook Trout</td>
<td>85,000</td>
<td>17,500</td>
<td>67,500</td>
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<td></td>
<td>Rainbow Trout</td>
<td>226,500</td>
<td>226,500</td>
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<tr>
<td>SEQUOIA 311,500</td>
<td>Brook Trout</td>
<td>27,600</td>
<td></td>
<td>27,600</td>
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<tr>
<td></td>
<td>Rainbow Trout</td>
<td>27,600</td>
<td></td>
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<tr>
<td>SHENANDOAH 27,460</td>
<td>Rainbow Trout</td>
<td>425</td>
<td>425</td>
<td></td>
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<td>Spearfish, S. D. (P)</td>
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<td>WIND CAVE 425</td>
<td>Rainbow Trout</td>
<td>425</td>
<td></td>
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</tr>
<tr>
<td>YELLOWSTONE 15,790,232</td>
<td>Blacksptott Trout</td>
<td>11,404,216</td>
<td>2,187,105</td>
<td></td>
<td>4,055</td>
<td>Ennis &amp; Bozeman, Mont. F.</td>
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<tr>
<td></td>
<td>Rainbow Trout</td>
<td>1,067,616</td>
<td>1,066,160</td>
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<td>Yellowstone hatchery</td>
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<td></td>
<td>Loch Leven Trout</td>
<td>479,290</td>
<td>240,000</td>
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<tr>
<td></td>
<td>Grayling</td>
<td>2,833,235</td>
<td>2,833,235</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>Mackinaw Trout</td>
<td>5,875</td>
<td>5,875</td>
<td></td>
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<tr>
<td>YOSEMITE 840,600</td>
<td>Loch Leven Trout</td>
<td>219,200</td>
<td>187,685</td>
<td></td>
<td></td>
<td>Yosemite Park, Calif. S.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rainbow Trout</td>
<td>261,400</td>
<td>261,400</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>BANDELIER 500</td>
<td>Blacksptott Trout</td>
<td>500</td>
<td>500</td>
<td></td>
<td></td>
<td>New Mexico Game and Fish Comm. S.</td>
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</tr>
<tr>
<td>BLUE RIDGE PARKWAY 23,000</td>
<td>Rainbow Trout</td>
<td>4,860</td>
<td>18,140</td>
<td>4,860</td>
<td></td>
<td>Wytheville, Va. &amp; F and Marion, Va. S.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brook Trout</td>
<td>18,140</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>BOULDER DAM 20,100</td>
<td>Rainbow Trout</td>
<td>20,100</td>
<td>20,100</td>
<td></td>
<td></td>
<td>Springville, Utah F.</td>
<td></td>
</tr>
<tr>
<td>TOTALS 22,383,592</td>
<td>22,383,592</td>
<td>22,383,592</td>
<td>12,125,618</td>
<td>6,656,593</td>
<td>239,557</td>
<td>Total: 22,383,592</td>
<td></td>
</tr>
</tbody>
</table>

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* 4 to 6 in. fish
* 11 incl. 3,000 fish, 2 to 11 in.
* 1 to 5 in. fish: majority under 5 in.
* State-operated hatchery
* Excludes known planting losses
* Hatchery or egg-collecting station operated by U.S. Fish and Wildlife Service

B. Outline a program of desired research projects for individual areas which can be most logically undertaken by cooperating organizations, and the development of liaison activities aimed toward the fostering of such cooperative assistance.

C. Plan and carry out a systematized research program under National Park Service auspices in accordance with the needs of various areas in the National Park System.

D. Organize and evaluate data derived from past and current research in a manner that will insure its ready adaptation to administrative and interpretive needs.

E. Provide facilities and personnel required in an authentic interpretation of basic values in the various areas, as well as those which are necessary for the maintenance, use, and care of valued records, collections, etc.

F. Secure and evaluate the basic data for Congress, the President, and the Secretary in considering historical, archeological, scenic, and scientific areas proposed for inclusion in the National Park System or newly acquired areas.

G. Secure and evaluate the basic data needed in making a nationwide survey of historic sites to insure a systematic program of historical conservation for the Nation as required by the Act of August 21, 1935 (49 Stat. 666).

H. Investigate, identify, and evaluate all features of outstanding scenic, scientific, historic, and archeological importance relative to existing and future recreational and inspirational resources of the National Park System in the United States and territorial possessions with a view toward recommending procedures designed for protection, perpetuation and proper utilization of such resources. (157)

In 1947, a second report was prepared titled "Research in the National Park System - A Narrative Statement on Policy and Research Administration Prepared for the President's Scientific Research Board." This report outlined servicewide research policy and administrative procedures. In the memorandum from the Director transmitting the report to the Departmental Committee on
Scientific Personnel, Drury states "In reading the enclosed statement I think you must conclude that the status of our research endeavor is not altogether satisfactory" (151).

The Second Park Naturalists' Conference

The Service's naturalists met for the second time between November 13 and 17, 1940 at Grand Canyon National Park. As was the case during the 1929 conference, a significant amount of time was devoted to presentations on natural resource management topics. A handful of Regional biologists, foresters and geologists presented talks on research, photography and interdepartmental cooperation. (171)

Assaults on the Parks

War Threats

Just as the war effort during the First World War gave cause to attempt to open the resources which are "locked up" in the National Parks, so it was with the Second World War. The threats to the parks were many, but some of the more significant were grazing, logging and mining.

Livestock men, always patriotic in war time and anxious to do their full part to feed the nation, again tried to get their cattle and sheep into the parks, but Ickes and Drury managed to keep grazing in the major parks down to [a] prewar level. In national monuments, recreational demonstration areas, and historical areas, they allowed an increase from 20,000 to 25,000 cattle and from 74,000 to 82,600 sheep. There had been a small amount of grazing in ten of the national parks and a considerable amount of grazing in ten other national parks and in thirty three of the national monuments and other areas; but it had long been the fixed aim of the Park Service to reduce the amount of grazing gradually and eliminate it ultimately. A drought in the spring of 1944 brought new demands from stockmen, and Drury advised Ickes to consider limited grazing in some park
areas in California as a war emergency measure if it could be shown to be necessary to save pure bred stock from starvation. Ickes set up a grazing committee, including representatives of the Sierra Club, the California Council, the Western Federation of Outdoor Clubs and the Forest Service; but the committee reached the conclusion that there was no necessity for more grazing in the parks. In Yellowstone Park, in 1943, government hunters killed 691 elk and gave the meat to eleven Indian agencies and to the Montana Fish and Game Commission, and hunters killed 7,230 outside the park, but these were not mainly patriotic gestures. There were too many elk in Yellowstone.

The war threat to national park forests was quite serious. There was a shortage of Sitka spruce used in airplanes, ... and there were magnificent spruce trees in Olympic Park. Ickes and Drury held that none should be cut 'unless the trees were absolutely essential to the prosecution of the war, with no alternative and only as a last resort'; but they could not well stand out as 'slackers' in the war, so they made available some 4 million feet of spruce in the Coastal Strip and Queets Corridor. These areas were not yet a part of Olympic, but much of the land had been bought with the purpose of adding it. Before much damage had been done, the War Production Board got some Sitka spruce from Canada, Washington, and Oregon and found ways of using aluminum more. The War Production Board and lumbermen also wanted spruce and hemlock in Great Smoky Mountains, but found other wood. Manufacturers of tannin extract demanded dead chestnut trees along Blue Ridge. For a while there was a largely imaginary threat to all the country's timber the threat of arson by traitorous sympathizers with the enemy. With the CCC workers disbanded and park employees greatly reduced, this looked like a real danger; but no clear evidence of such arson was ever seen.

A war calls for vast amounts of various minerals, and although the parks and monuments had few minerals, there were demands that they provide whatever they had that was needed. A deposit of tungsten in Yosemite was opened to mining, on recommendation of the Bureau of Mines, the Geological Survey, and the War Production Board; copper was reported in Grand Canyon and Mount Rainier, but the reports proved false; manganese was said to be found in Shenandoah, but this report was also false; some 15,000 tons of salt were mined in Death Valley; in the Olympic Acquisition area and in the Sitka National Monument thousands of tons of sand and gravel were mined for construction uses; in Mount McKinley Park the Park Service allowed the owner of an antimony mine to build a short cut road across the park to get crude
ore out; operators of manganese mines adjacent to Olympic were allowed to use park lands for truck trails to reach the highways; and in Death Valley four access roads were allowed to reach sources of manganese, lead, tungsten, and talc. Some of these mines and roads disfigured the parks and monuments to some extent but the Park Service wished to do its loyal part in the war.

A detailed account of the war related involvement of the Service was prepared under the editorship of Charles Potter of the Branch of History in 1946 (101). Drury was actually quite successful at minimizing the destruction of park resources during the war, but the war's end brought an even more vexing issue to light.

**Water Projects**

Aside from the threats generated by the war effort, the single most important resource issue of Drury's administration was the attempt to develop reservoirs and flood control projects on parkland. John Ise has developed an excellent summary of recreational water projects during the 1940s.

Under the Park, Parkway, and Recreational Area Study Act of 1936, the Park Service had made studies of the recreational resources at reservoir sites, but early in the Drury administration these studies took a new turn; the Bureau of Reclamation and the Army Engineers began to ask the Service to study recreation possibilities before the reservoirs were created.... In November 1940 the Bureau of Reclamation requested the Park Service to study the... resources of the Colorado Basin as part of a comprehensive plan for the utilization of the water resources of the region.... The work was done by the Branch of Lands of the Service, headed by Conrad Wirth, with Frederick Law Olmstead as consultant, and the report was completed in 1946 - an excellent report.

Other areas followed ....

Unfortunately, the Reclamation Service and the Army Engineers were not punctilious as to where they planned to build their dams; the national parks looked as good to them as anywhere, or perhaps a bit better than most other places, because there were good power sites in
the national parks. (187)

Water power, irrigation and flood control projects were proposed
in the Grand Canyon, in Glacier, in Mammoth Cave, in Kings
Canyon, in Big Bend, and in Dinosaur.

By far the most controversial attempt at a park raid
was, however, the effort of the Bureau of Reclamation to
build two dams in the Dinosaur National Monument. This
monument, originally (1915) an 80 acre dinosaur grave
yard, was enlarged by President Roosevelt in 1938 to
209,744 acres of some of the most scenic canyon land in
the West. The proclamation adding this land contained a
provision which was later cited as permitting the build­
ing of dams: "this reservation shall not affect the
operation of the Federal Water Power Act of June 10,
1920, as amended, and the administration of the monument
shall be subject to the Reclamation Withdrawal of Octo­
ber 17, 1904, for the Brown's Park Reservoir Site in
connection with the Green River Project.' Opponents of
the Dinosaur Dam insisted that this provision conferred
no rights but there was dispute about it....

The 1946 report on the recreational resources of the
Colorado River Basin was definitely critical of the two
dam sites suggested for Dinosaur Echo Park and Split
Mountain. "Construction of dams at these sites would
adversely alter the dominant geological and wilderness
qualities and the relatively minor archeological and
wildlife values of the Canyon Unit so that it would no
longer possess national monument qualifications.'

Three years later, notwithstanding this report,
Commissioner Straus of the Reclamation Bureau wrote to
Secretary of the Interior Chapman asking him to approve
the dam, and ten days later, Drury addressed a memoran­
dum to Chapman urging him to deny the application.

... With lush funds at its disposal, the Reclamation
Bureau put on a very effective propaganda campaign which
won over many of the people of Utah and western
Colorado....

...Secretary Chapman called for hearings on April 3,
and at the hearings he announced: "It is my purpose in
holding these hearings to try to determine from you
people which you think is the more important to the
country, the largest number of people who can be served
and the greatest good that can be served ...'

The hearings were not altogether amicable, for Drury
and the Park Service were resolute in their opposition
to the dams; but on June 27, 1950, Chapman announced his
decision to approve .... (187)
Despite this decision, a year later, Chapman reversed his thinking in terms of dams in the parks.

Secretary Chapman finally decided that he had enough for fighting the dams, and in 1951 issued an order barring the Bureau of Reclamation from surveys and investigations in national parks and monuments, wilderness areas, and wildlife areas. (187)

A Dilemma

During the war, many of the park facilities (trails, campgrounds, roads, bridges, etc.) fell into disrepair due to shortages of funds and personnel. As if this situation were not enough, visitation to the parks tripled between 1943 and 1946. By 1948, it was almost five times that of 1943. Post war "people pressure" on the parks was reaching crisis levels.

In 1949, the Director issued a position paper titled "The Dilemma of Our Parks." The article graphically explains the post war threats to the parks of too few employees, insufficient funds and too many visitors. (10)

Summary

Unfortunately, relief from these threats was not quick in coming. How frustrating it must have been for Newton Drury, whose sincere concern for the preservation of park resources is best illustrated by his own words:

It has been apparent during recent years that every advance in the field of conservation must be fought for, and that thereafter it is necessary to fight to hold what has been gained. The continued efforts to abolish Jackson Hole National Monument; the campaign to reduce Olympic National Park; the many proposals to impose water impoundments on park lands; pressures, whenever drought reduces the capacity of California grasslands, to throw domestic livestock into the high meadows of the California parks; the insistence of mining interests that Joshua Tree National Monument be opened in its
entirety to mineral entry - these suggest how numerous and varied are the threats to the integrity of the parks and monuments.

Through eternal vigilance and concerted action these must be warded off. We are thankful for the awakened awareness among conservation organizations everywhere of the strength of joint effort. And we are thankful for their willingness, knowing the facts, to exert that effort to safeguard these great properties of the American people.

In a letter that we received several months ago from a New York newspaperman was the statement, 'The national parks are the greatest lessons in Americanism this country offers.' We agree that they ought to be; they are the superlatives of our American estate; and they should be developed and managed in a superlative way. In many respects, they are so managed. (10)

Policies

The principal policy issue of Drury's administration, related to natural resources management, was grazing. Obviously this was in direct response to attempts to open the parks to grazing during the war. Following are excerpts from that policy:

The long established policy of excluding grazing from the mountain meadows and grass lands of the national parks and monuments has been reaffirmed by Secretary of the Interior Harold L. Ickes....

The National Park Service will continue to hold grazing to a minimum and eventually eliminate it from the national parks.... Experience in the administration of these areas and the reactions of the people of this Nation clearly demonstrate that the highest public interest will be served, even in wartimes, by holding intact and unimpaired the outstanding natural and historic areas without disturbance of the natural factors that contribute to their greatness. (151)

In addition, definitive wildlife policies were put to writing early during Drury's administration. Following are those policies as they appeared in 1943:

1. No management measure or other interference with biotic relationships shall be undertaken prior to a properly conducted investigation.
2. Every species shall be left to carry on its struggle for existence unaided, as being to its greatest ultimate good, unless there is real cause to believe that it will perish if unaided.

3. Where artificial feeding, control of natural enemies, or other protective measures are necessary to save a species that is unable to cope with civilization's influences, every effort shall be made to place that species on a self sustaining basis once more; whence those artificial aids, which themselves have unfortunate consequences, will no longer be needed.

4. No native predator shall be destroyed on account of its normal utilization of any other park animal, excepting if that animal is in immediate danger of extermination, and then only if the predator is not itself a vanishing form; when control is necessary it shall be accomplished by transplanting or, if necessary, by killing offending individuals, not by campaigns to reduce the general population of a species.

5. Species predatory upon fish shall be allowed to continue in normal numbers and to share normally in the benefits of fish culture.

6. The number of native ungulates occupying a deteriorated range shall not be permitted to exceed its reduced carrying capacity and, preferably shall be kept below the carrying capacity at every step until the range can be brought back to original productiveness.

7. Any native species or subspecies which has been exterminated from the park area shall be brought back if this can be done, but if said species or subspecies has become extinct, no related form shall be considered as a candidate for reintroduction in its place.

8. Any exotic species which has already become established in a park shall be either eliminated or held to a minimum providing complete eradication is not feasible; and the possible invasion of the parks by other exotics shall be anticipated and steps taken to guard against same.

9. Presentation of the animal life of the parks to the public shall be a wholly natural one.

10. No animal shall be encouraged to become dependent upon man for support.
11. Problems of injury to the persons of visitors or to their property or to the special interests of man in the park, shall be solved by methods other than those involving the killing of the animals or interfering with their normal relationships, where this is at all practicable. (116)

These policies are virtually identical to those prepared by George Wright, although they have been condensed slightly.

The general fisheries policies were also formalized by this time:

To bring all fish cultural activities in the national parks and monuments within the general policies applying to all other forms of animal life, the following policy affecting fish planting and distribution shall be adhered to:

No introduction of exotic species of fish or other exotic aquatic life shall be made in national park or monument waters now containing only native species.

In waters where native and exotic species now exist, the native species shall be definitely encouraged.

In waters where exotic species are best suited to the environment and have proven of higher value for fishing purposes than native species, plantings of exotics may be continued with the approval of the Director and of the Superintendent of the park in which such waters are located.

The wider distribution of exotic species of fish within the national parks and monuments shall be prohibited, and a thorough study of the various park waters shall be encouraged to the end that a more definite policy of fish planting may be reached.

The number of any species of native non game fish should not be reduced even where such reduction may be in the interest of better fishing.

All forms of artificial stream improvement which would change natural conditions should be avoided, but the restoration of streams and lakes to their natural conditions is permissible where thorough investigation indicates the desirability of such action.

In cases where a lake or stream is of greater value without the presence of fishermen, there should be no
stocking of such waters.

In national parks and monuments where certain lakes which do not contain fish still remain, permission of the Director must be secured before they are stocked with fish. (116)

Although the author's research revealed nothing on forest management policies of the 1940s, it is reasonable to assume that they had not changed since the 1930s. John Coffman was still the Service's Chief Forester.

Drury's Resignation

The Echo Park controversy of Dinosaur was the "straw that broke the camels back" resulting in Drury's resignation. Drury had openly opposed the construction of a dam in Dinosaur despite the fact that Secretary Chapman favored it. Drury's insubordination gave Chapman justification to request his demotion or resignation. On April 1, 1951, Newton Drury returned to California to accept a position with the California Division of Beaches and Parks.

Chapman's action represented a vindictive and in glorious anticlimax to an otherwise good administration as Secretary of the Interior. Aside from the discourtesy of his treatment of an able and conscientious public servant - who was right, as Chapman implicitly conceded later when he changed his mind and testified against the Dinosaur dam - there was the question as to the effect of his action on park administration.... Furthermore, as the editor of American Forests pointed out: "At stake, however, is much more than the disposition of one man's job. Of basic concern is the question of a new principle in casting off and selecting administrative leaders. Certainly conservation, or any other cause, will suffer if we abandon the custom of seeking out the most qualified man in the nation to direct our vital land use programs. Nor will government be able to entice such caliber of man into a position subject
either to pressure or politics. Various organizations presented petitions to President Truman, protesting against Chapman's action, but without effect. Drury was out, but Dinosaur was not lost. (187)

The Demaray Interlude

Upon dismissal of Newton Drury, Secretary Chapman appointed Arthur E. Demaray as Director. Demaray was a career man who had risen through the ranks of the Service and was nearing retirement. (187) At least one author expressed the feeling that Demaray's selection was merely a token of thanks for his years of dedicated service. Demaray left the agency on December 9, 1951, after eight short months as the Director. (187) Needless to say, those eight months were over before any important changes occurred in the management of park resources.
Chapter 7

THE WIRTH YEARS

An Old Hand

Conrad L. Wirth was chosen to succeed Arthur Demaray. Wirth had extensive Service experience, having started his career with an appointment, in 1931, as head of the Branch of Lands. Shortly thereafter, he was given responsibility for the Service's involvement in the Emergency Conservation Work Program of the New Deal. During the latter part of the Second World War, he served as a civilian advisor in Europe. (203)

Wirth's background prepared him well for two thrusts which would have sweeping impacts on the management of park resources. Wirth's forte was land protection. His skillful application of knowledge in this field broadened the types of park resources in the System, unlike ever before. Wirth was also adept at managing large scale operations such as the Civilian Conservation Corps. Undoubtedly, this would prove useful in the implementation of his Mission 66 program.

Mission 66

Wirth inherited an agency which was understaffed and park facilities which were in need of extensive repairs. Conditions were so poor in the parks that Bernard DeVoto, a member of the Advisory Board on National Parks, Historic Sites, Buildings and Monuments, was prompted to write an article titled "Let's Close
the National Parks in 1953" (259). During the first years of Wirth's administration, unsuccessful efforts were made to obtain more funding for the Service. Relief finally came in 1956, when President Eisenhower endorsed the Mission 66 initiative. (203) Mission 66 was construction intensive. Emphasis was placed on road, visitor center, and employee housing construction. Mission 66 development programs, unlike the CCC projects, never received rigorous scrutiny by biologists. Thus facilities, like the campground at Big Meadows in Shenandoah National Park, were located in inappropriate areas. Although this program was beneficial in many ways, the benefits provided in the management of natural resources were mixed at best. Little attention was paid to the weak biological programs of the agency although one document indicated that additional funds were sought under the Mission 66 umbrella for soil and moisture conservation, forest pest management, wildlife management and fire control (97,96). Undoubtedly, limited increases were received, but, no major strides were made during the 1950s.

Park System Expansion

During Wirth's administration, approximately 40 units were added to the National Park System. The single most important thread which tied many of these new parks together was their diversity. Up to this time the System included examples of the desert southwest, the Rocky Mountains, the Sierras and the Cascades; of volcanism, erosion and glaciology; of giant trees, petrified forests and eastern deciduous forests; of caves and
sand dunes; of rain forests and swamps (189). Despite this
diversity, certain ecosystems and natural history themes were
still not represented in the System (lakeshores, seashores, and
coral reefs). The Service, under Conrad Wirth, added coral
islands at Buck Island Reef National Monument and three sea­
shores. (189)

The National Park Service made its first seashore
recreation survey in the mid 1930's. It resulted in a
recommendation that 12 major stretches of unspoiled
Atlantic and Gulf Coast shoreline, with 437 miles of
beach, be preserved as national areas. World War II
intervened and by 1954 only one of the 12 proposed areas
had been authorized and acquired — Cape Hatteras Na­
tional Seashore, North Carolina. All the others save
one — Cape Cod — had long since gone into private and
commercial development. Seashore studies were resumed
by the Service in the mid 1950's through generous sup­
port of private donors. These new shoreline surveys
resulted in several major reports including Our Vanish­
ing Shoreline (1955); A Report on the Sea­
shore Recreation Survey of the Atlantic and Gulf Coasts
(1955); Our Fourth Shore, Great Lakes Shoreline Recrea­
tion Area Survey (1959); Pacific Coast Recreation Area
Survey (1959). Detailed studies of individual projects
were also prepared as a part of the Service's continuing
efforts for shoreline conservation. (189)

Cape Hatteras had been established in 1937; Cape Cod in
1961 and Point Reyes and Padre Island in 1962 (189). Although
authorized in 1937, Cape Hatteras did not become a reality until
the Wirth administration (203,19).

Legislation

Aside from the authorization of numerous new parks, only
one major piece of legislation appeared during the Wirth adminis­
tration which had direct implications on resource management.
In fact, that legislation was incorporated in the legislation
which established Grand Teton National Park on September 14, 1950. The author has chosen to include this legislation under the Wirth administration, even though it predates his Directorship by just over a year, because its subject matter would become extremely important while Wirth was Director. Herbert Evison has provided a summary of this legislation:

The act authorizing the enlarged Grand Teton National Park (68 Stat. 849) requires the Wyoming Game and Fish Commission and the National Park Service to devise "a program to insure the permanent conservation of the elk' within the park, to 'include the controlled reduction of elk... by hunters licensed by the State of Wyoming and deputized as park rangers by the Secretary of the Interior, when it is found necessary for the purpose of proper management and protection of the elk.' ... Under all the verbiage, the fact is that there is hunting in Grand Teton.

Except in two seasons, "deputy rangers" have been appointed each year since the law was passed. Their kill, averaging about 178 animals a year, is of minor importance in the control program. Even that average must be discounted somewhat since undoubtedly many who killed elk in the park would have killed elsewhere had it not been open to them. A common aftermath of the "control" period is the discovery of dead elk not reported, as well as dead moose and other animals.

In some quarters, the Grand Teton arrangement seems to be considered something of a precedent. Legislation introduced in Congress in 1962 would have applied it to the Utah portion of Dinosaur National Monument.... (180)

Organization

Division of Natural History

During the Wirth administration, the Division of Natural History underwent two significant reorganizations. In 1958, for the first time since the 1930s, the responsibility for natural science (research) and natural resource management was split. A Branch of Natural History, within a new Division of Interpretation, retained the responsibility for research, while management
duties were transferred to the Division of Ranger Activities as a Branch of Resources Protection. Then, in 1963, the Branch of Natural History was essentially dissolved with its functions being transferred to an Office of Natural Science Studies. This split between the research biologists and the management biologists (as they became known) would result in a long term rift within the agency.

Wildlife Biology. Victor Cahalane continued as the Service's Chief Biologist until 1955, when he left the Service. Gordon Fredine replaced Cahalane and continued in that position until 1960 (199). Howard Stagner then succeeded Fredine who had moved on as a planner with the Mission 66 program. In 1957, O. L. Wallis, who had been Chief Naturalist at Lake Mead National Recreation Area, was given the position of Aquatic Biologist in the Washington Office (138). Wallis was the first aquatic biologist the agency had since David Madsen. As indicated previously, a Branch of Resources Protection was established in 1958. Shortly thereafter, this Branch became the Park Forest and Wildlife Protection Branch.

During the 1950s, most of the biological staff was stationed in parks and regional offices. Figure 8 lists the most prominent biologists and their duty stations. Despite the presence of these biologists, the agency was still sorely lacking in this area of expertise.

Some of the strain on biological staffing was relieved in 1959 when 59 "Wildlife Rangers" were designated throughout the
E. Lowell Sumner - Sequoia National Park

Walter Kittams - Midwest Region

James Cole - Rocky Mountain National Park and Isle Royale National Park

Robert Bendt - Grand Canyon National Park

William Robertson - Everglades National Park and Virgin Islands National Park

Coleman Newman - Olympic National Park and Big Bend National Park

Adolph Murie - Mt. McKinley National Park and Grand Teton National Park

Figure 8

PROMINENT AGENCY BIOLOGISTS AND THEIR DUTY STATIONS 1950s

parks (77). Their responsibilities included animal reduction, re-introduction of extirpated species, censusing, appraisal of browse and forage conditions, protection of endangered species and elimination of exotic species (151). A 1959 conference report also indicates that management biologists were assigned to Regions Two, Three, Four and Five (166). In 1963, branches of wildlife management and forestry were established within the Division of Ranger Services. Robert Bendt became the first Chief of this new Branch of Wildlife Management.

**Geology.** Max Bauer retired in 1952, and was replaced as Chief Geologist by T. Bennet Cale. Cale was then replaced by Robert Rose in 1961. When the Division of Natural History was abolished, in 1958, it appears that the Chief Geologist remained within the Branch of Natural History in the Division of Interpretation. Sometime later, the position was moved into the Office of Natural Science Studies and emphasis was placed on geological research.

**Division of Forestry**

John Coffman continued as the Service's Chief Forester until 1952. His assistant, Lawrence F. Cook, was named as his replacement that same year. Serving under Cook were Ralph W. Smith, in charge of tree preservation, and George A. Walker, in charge of fire control training. Jack B. Dodd joined this group as Assistant Chief. Frank Kowski also worked with this group but, his function was not determined (181).
In 1954, the Division of Forestry was absorbed into a Branch of Conservation and Protection within the Division of Operations. Shortly thereafter, Lemuel A. Garrison was named Chief of this Branch (181). In 1956, Garrison left that post to join the Mission 66 steering committee. John Davis replaced Garrison (181).

In May 1957, [John] Davis recommended to the Service's Management Improvement Committee the organization of a Division of Conservation and Protection, with the development of the staffs to be created in the Washington and Regional Offices, to be spread out over a three year period. Created would be a Branch of Forestry, Branch of Visitor Protection and Use, and a Branch of Wildlife Protection with a Protection Training Officer and an Analytical Statistician.

In mid 1957, the Management Improvement Committee recommended to Director Wirth the establishment of a Division of Ranger Activities with three Branches: (1) Visitor Protection; (2) Park Forest and Plant Protection; (3) Resources Protection. This organization change was approved by Director Wirth on July 11. The Park Forest and Plant Protection and Resources Protection branches were later combined into the Branch of Park Forest and Wildlife Protection. John Davis was made Division Chief and Larry Cook, Chief of the Park Forest and Wildlife Protection Branch. He later succeeded Davis as Division Chief when Davis transferred to Sequoia in 1959 as Superintendent. (185)

By 1963, the Park Forest and Wildlife Protection Branch was divided with the re establishment of branches for forestry and wildlife management.

During this same period, some regions apparently had Regional Foresters on their staffs (77) and a handful of fire control aids and experts were added to the staff of larger parks where fire was a problem (185).
Land and Recreational Planning Division

In 1950, separate Divisions of Land Planning and Recreational Planning were created. Ben Thompson directed the latter and Charles A. Richey was put in charge of the former (69).

Programs

The ten years between 1951 and 1961 saw an intensification and diversification of resource management issues. Heavy emphasis on construction projects, shortages of personnel and the rapid development of resource problems resulted in emphasis on critical issues only.

Wildlife Management

Typical of the wildlife management programs of the time were those of wildlife biologist Gordon Fredine. He has indicated that he was involved in projects such as moose and wolf studies in Isle Royale National Park, organization of the Desert Bighorn Council, cougar concerns at Big Bend National Park, and relationships between wildlife and visitors at Mt. McKinley National Park (124).

This decade was also the time frame for the solidification of the Service's approach to bear management. In 1960, a management strategy and mandate was issued by the agency calling for the restoration of the wild state of all wildlife. The guideline stressed aggressive programs to achieve those conditions, as well as preventive measures to stop the return or spread of "spoiled"
bears (151,129).

Clearly, the wildlife management issue of critical importance during the 1950s and early 1960s was wildlife population control, particularly as it related to ungulate populations. The imbalance between wildlife numbers and the ability of the habitat within the parks to sustain those animals was recognized during the early years of agency development. For thirty years, the Service made numerous, sporadic, half hearted and unsuccessful attempts to restore that balance in a number of the parks (163,159). The list of parks with excessive populations of wildlife was sizable and included Grand Canyon, Sequoia, Kings Canyon, Glacier, Acadia, Mammoth Cave, Yellowstone, Grand Teton, Rocky Mountain, Zion and Wind Cave National Parks (290). Most of these problems centered around deer and elk (290).

As recounted previously, the seriousness of the situation was addressed in the legislation which authorized Grand Teton National Park. The Service had its hands full in merely coping with the over population issue. The situation was aggravated by controversy over who should do the hunting to reduce the herds and by the commitment on the part of several organizations to block the expansion of the Park System unless hunting was allowed in the new parks.

At the North American Wildlife and Natural Resources Conference (March 9, 1961), Conrad Wirth, Director of the NPS, shocked many conservationists and NPS personnel when he issued a public statement that to hunt in national parks was being considered. Wirth stated, 'They (overpopulations of wildlife) are ruining the natural habitat and we may call on hunters to help us. They are eating up the parks.' Wirth said the program would be carried out 'only in those portions of the Park where in
the judgement of the Secretary of the Interior such participation is practical, desirable and may be carried out safely and effectively.' Wirth noted that the Secretary of the Interior was empowered to permit hunters on the land. He said, 'It's his job to keep it a natural habitat.' However, Wirth's reluctance to abandon previous traditional park policy could be detected when he said, 'Personally, I have mixed feelings about this. It's something I'd rather not do. But right now we're doing the shooting and this has to be done and it could save us money and manpower.' (186)

The upshot of all the misgivings ... was Wirth's issuance, in October 1961, of a statement upholding the long standing policy of the Service. The statement is a position paper thoughtfully and concisely expressed. After listing the major questions involved, it declares: 'An objective consideration of these questions leads to the conclusion that public hunting is neither the appropriate nor the practical way to accomplish National Park and Monument purposes.'...

The conclusion of Wirth's statement may be said to constitute a basic credo of park wildlife management. State fish and game authorities may have gnashed their teeth over his insistence that 'the Secretary of the Interior, through the Director of the National Park Service, will continue to be responsible for the conservation and management of the wildlife within the boundaries of the National Parks and Monuments.'... (180)

The first funding for biological research ($28,000) was appropriated in 1958 and the "Fauna Series" was revived in 1961 with the publication of The Bighorn of Death Valley. (199)

In 1960, the National Park Service signed a Memorandum of Understanding with the Fish and Wildlife Service to obtain cooperative assistance in research, surveys, animal damage control, and restoration and to set standards for specimen management and manuscript preparation. This document replaced a similar agreement dated March 5, 1946. (151)

Finally, during the early 1960s, the Division of Ranger Activities published two annual reports on wildlife management throughout the System (118,119). The data on Table 3, taken from
Table 3
WILDLIFE AND RELATED STATISTICS
1961 - 1962

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Parks with important fish populations</td>
<td>59</td>
</tr>
<tr>
<td>2. Parks withfish stocking programs</td>
<td>17</td>
</tr>
<tr>
<td>3. Acres in lakes supporting fish</td>
<td>1,183,065</td>
</tr>
<tr>
<td>4. Miles of streams supporting fish</td>
<td>7,857</td>
</tr>
<tr>
<td>5. Parks with important wildlife populations</td>
<td>79</td>
</tr>
<tr>
<td>6. Acres of valuable wildlife habitat</td>
<td>14,433,329</td>
</tr>
<tr>
<td>7. Parks with known deer problems</td>
<td>24</td>
</tr>
<tr>
<td>8. Parks with deer control programs</td>
<td>8</td>
</tr>
<tr>
<td>9. Parks with elk problems</td>
<td>6</td>
</tr>
<tr>
<td>10. Parks with elk control programs</td>
<td>4</td>
</tr>
<tr>
<td>11. Parks with bighorn sheep</td>
<td>20</td>
</tr>
<tr>
<td>12. Parks needing restoration of bighorns</td>
<td>9</td>
</tr>
<tr>
<td>13. Parks impaired by exotics</td>
<td>10</td>
</tr>
<tr>
<td>14. Parks with black bear population</td>
<td>38</td>
</tr>
<tr>
<td>15. Parks with bear problems</td>
<td>14</td>
</tr>
<tr>
<td>16. Parks with grizzly populations</td>
<td>6</td>
</tr>
<tr>
<td>17. Parks with cougar populations</td>
<td>40</td>
</tr>
<tr>
<td>18. Parks with wolf populations</td>
<td>7</td>
</tr>
<tr>
<td>19. Parks with buffalo management programs</td>
<td>6</td>
</tr>
<tr>
<td>20. Major species needing investigation</td>
<td>50</td>
</tr>
<tr>
<td>21. Parks needing reintroduction of extirpated species</td>
<td>25</td>
</tr>
<tr>
<td>22. Parks having wildlife as a major visitor interest</td>
<td>57</td>
</tr>
</tbody>
</table>

one of those reports, provides a good overview of the wildlife management activities at the time.

**Fisheries Management**

By the early 1960s, the Service had embarked on a new fisheries management concept titled "Fishing for Fun." This program, which was promoted by Orthello Wallis, focused on the recreational benefits which can be derived from fishing. The importance of the catch was diminished. At its peak, the program was instituted in 25 states through special regulations. Parks which participated in the program included Great Smoky Mountains, Sequoia, Kings Canyon, Shenandoah, Yellowstone, and Yosemite. Other parks instituted regulations governing the use of artificial flies and lures. Similarly, catch and release programs were encouraged for marine fisheries. (151)

Although these programs continued to allow consumptive use of aquatic resources, that use was reduced and some benefit was derived from the effort. Unfortunately, many of these programs were also tied to artificial maintenance of fish populations. Remnants of both the catch and release program and stocking program still exist in some parks.

One major fisheries issue which surfaced at this time was the rotenone control program conducted in September of 1962 on the Green River within the Flaming Gorge National Recreation Area. Rotenone was being utilized to kill non game fish which would be replaced by trout. Despite efforts to detoxify the rotenone as it moved down stream, residual quantities entered Dinosaur National Monument killing fish and aquatic insects.
Another issue, which had gone unresolved for several years, finally came to an end early during Wirth's administration.

Previous annual reports have indicated the need of regulation of fishing and fishing practices in Florida Bay and other salt water areas of Evergaldes National Park. Following publication of proposed regulations in the Federal Register, a public hearing was held in Homestead, Fla., last November to learn the public reaction to them. Interest was keen; organizations with a total membership of 30,700 were represented. Main target of the regulations was the drag seine, which was destroying the fisheries of Florida Bay, and was endangering the bird and animal life of the area by destroying their food.

The regulations were promulgated by Secretary Chapman in March. Sports fishermen, conservationists, and most commercial fishermen strongly endorsed his action. (70)

Geology

The 1953 "Annual Report of the Secretary of the Interior" provides the only official information on this program the author was able to locate:

Liaison was maintained with the Geological Survey, the National Museum, State geological bureaus, and various institutions, organizations, and individuals interested in or engaged upon geological, mineralogical, or palentological investigations within the National Park System. Significant accomplishments in this field were (1) completion of geological field studies in Great Smoky Mountains National Park, (2) major progress in aerial mapping and groundwater investigation of Carlsbad Caverns National Park, (3) initiation of hydrological and sedimentation investigations at Mammoth Cave National Park, (4) furtherance of geomorphic studies in the Grand Teton - Jackson Hole region, and (5) the setting up of major geological investigations in Katmai National Monument. (72)

Cordon Fredine indicates that T. Bennet Gale was involved in mapping geological features, in geothermal studies and the management of barrier reefs and islands (124).
Forest Protection

Unlike the biological and geological programs, forestry continued at high levels of activity throughout the 1950s and early 1960s. Forest insect and disease control work continued in full force. White Pine Blister Rust control efforts continued throughout the decade (71,73,76). In 1952, efforts began to control Oak Wilt at Effigy Mounds National Monument (31). In 1954, those control efforts were expanded to include Shenandoah National Park (31,73). Other insect and pathological concerns included Dutch elm disease, Ponderosa Pine Mistletoe, Lodgepole Pine Needleminer, Black Hills Beetle, Mountain Pine Beetle, Jeffrey Pine Beetle, Southern Pine Beetle, Spruce Budworm, Pinyon Sawfly, Western Pine Beetle, Great Basin Tent Catepillar, Spruce Bark Beetle, and Douglas Fir Beetle (31,74,73,71).

In 1951, a Tree Preservation Crew was established to work in Region One (70). Most of their work was in the National Cemeteries, although it extended to other historic sites and even Acadia and Mammoth Cave National Parks (71).

As was the case during the 1930s and 1940s, fire control remained a high priority (31). In 1952, smokejumpers were assigned to Yellowstone National Park for the first time (71). Sixty eight primary fire lookout stations were operated during this period and major efforts to mechanically remove fuel loads were undertaken (31). Ise has provided an interesting account of one such project:

Early in the 1950's the Park Service decided it would get some money to use for buying up private lands in Olympic by selling some of the dead, insect infested,
and down timber in the park to lumbermen. Under the National Parks Act the Park Service was authorized to dispose of timber when necessary to protect it from insects and diseases or conserve the scenery, and some of the timber apparently presented some hazard of fire and injury to tourists. At any rate, Wirth authorized contracts with lumbermen to salvage some of the timber. The salvage operations presently brought criticism from the Wilderness Society and the National Parks Association. Both sent men to inspect the salvage operations, and their reports were highly critical of the contracts and the way they were being carried out. It was asserted that the lumbermen did not follow good practices in their operations, did not take proper care of the soil, and that because the Park Service did not supervise the operations carefully enough the lumbermen cut sound trees as well as dead and diseased. The wilderness men objected altogether to the idea of selling timber — even dead, down, and infected trees — as contrary to national park principles, a worse evil than the existence of some private lands in the park. "The resources of the national parks should not be regarded as sources of potential revenues."... Soon afterward, Superintendent Fred Overly of Olympic Park replied to these criticisms, denying the soundness of most of them but admitting that some errors had been made. His defense seemed sincere and was rather convincing....

Here, as often, we see two opposing points of view, both honestly held and both maintained with some tenacity. (187)

A similar incident occurred in Olympic National Park, in 1957, with similar results (187).

Other programs which received the attention of the forest protection staff included exotic and noxious weed control, wood utilization and preservation, grazing permit supervision and soil and moisture conservation (151). During this same time, several of the "Tree Preservation Bulletins" were revised and reissued and a "Forest Protection Handbook" and a "Handbook for Fire Lookouts" were produced. Similar publications had not received attention for about 15 years.
Lands Management

The following excerpts from a report given by Charles Richey, Chief, Lands Division, at a Director's Staff Meeting, provide some understanding of the role of this Division:

The Lands Division is dedicated to the rounding out of existing and proposed areas of the System through the acquisition of lands and water rights and interests therein, so that the Service can carry out its fundamental purpose. The Division is one of the oldest segments of the Director's Office and is under the administrative jurisdiction of the Assistant Director for Operations.

All permanent records of land, water status and use are maintained in the Division. Here, too, are prepared land status and water resources data maps, graphic material, and statistical data for reports and publications. Matters relating to acquisition, perfection, and protection of water rights in compliance with State laws are also activities of the Lands Division....

Real Estate Branch. (James M. Siler, Chief) As the name implies, the Real Estate Branch supervises and correlates the numerous phases of the acquisition of non Federal lands within the boundaries of the areas comprising the National Park System, and for areas proposed for addition to it....

Water Resources Branch. (A. vanV. Dunn, Chief) The Water Resources Branch is fundamentally a coordinating engineering unit of the Lands Division which integrates the work of other branches and divisions concerning the appropriation and use of water resources as related to their conservation and development. The branch correlates these activities with the work of other Federal agencies and the several States. The keys to the mutual interests are the determination of relative water rights to the use of water, and the rights of access over Federal land to desired points of diversion or areas to be used for storage....

Land Management Branch. (Charles H. Gerner, Chief) This branch is the 'watch dog' of the special land uses of areas of the National Park System. It broadly supervises the management of land resource use, exclusive of concessions and grazing, which may be authorized to outside agencies and individuals.

This branch receives the Washington Office copies of all Special Use Permits and Defense Use Permits except those issued by National Capital Parks. Incoming permits are reviewed for conformity to rules and regulations, Service policies, completeness, and general accuracy. The branch accomplishes necessary research, studies and analyses, and prepares recommendations and
correspondence on problems and questions stemming from special uses, and on inquiries and requests for special uses.... (146)

Obviously, the staff of the Lands Division devoted a great deal of time to new area studies, particularly the shoreline sites.

Dams and Parks

During the early 1950s, the Service continued to grapple with the issue of dams and their impacts on parks. The politics of this issue were extremely complex and the number of proposals which would have had an effect on parkland is shocking. Most attention was focused on the Echo Park and Split Mountain dams, the Mining City dam, the Glacier View dam, the Bridge Canyon dam as well as dams in Big Bend and Kings Canyon National Parks (75,69).

It is not the intention of the author to provide an indepth account of the events centering around this issue; other authors have done this (195,187). The importance of this issue must be noted however, as it is one of the major resource protection issues the Service has faced. As mentioned in the previous chapter, the dams and parks issue was finally laid to rest by Secretary Chapman in 1951.

Chapman's prohibition did not, however, extend to the management by the Service of reservoir based recreation areas. Between 1933 and 1964, four reservoir associated national recreation areas were added to the System. One additional one was added to the System during this time but it has subsequently been transferred to the Forest Service for management. (189)

Management of these park areas meant a broadening of
perspectives in natural resource disciplines. In many cases, the legislation authorizing these areas specifically permitted consumptive use of park resources (mining, hunting, and grazing) and placed great emphasis on recreation. Resource consumption was in direct opposition to traditional park management principles.

Shoreline Preservation

Out of these studies [the shoreline studies cited previously] and the persuasive reports on them, followed by the effective missionary work of the Service, spearheaded by Wirth came the authorization, in 1961, of Cape Cod National Seashore and in 1962 similar authorizations for the Padre Island National Seashore, along the Texas Coast, and the Point Reyes National Seashore, a few miles north of California's Golden Gate...

In approving establishment of the three seashore areas, Congress also authorized appropriations for land purchases. It promptly appropriated $2,250,000 with which to start at Cape Cod. The 1963 Supplementary Appropriation included $5,000,000 for lands at Point Reyes. Fortunately for these projects, they had the warm support of President Kennedy and Secretary Udall. Nevertheless, greatest credit belongs to Wirth; if, in all his years with the Service, he had done nothing else than direct public attention to the "vanishing shoreline" and press for vigorous action to preserve some of it, he would deserve well of all Americans. (180)

Not only was this effort important in terms of protection of another landform, but, legislation authorizing these sites also authorized the use of appropriated funds for land acquisition. This was a major turning point in the agency's land management program.

Just as exceptions to accepted natural resources management principles were granted at reservoir sites, exceptions were given at seashore recreation areas.

In 1952, when the federal government first acquired lands for the Cape Hatteras National Seashore, the director of the National Park Service, Conrad L. Wirth,
wrote "A Letter to the People of the Outer Banks" declaring that the Park Service planned:

'... to protect and control the sand dunes, to reestablish them when necessary, and hold them to protect the communities from the intrusion of the ocean. The National Park Service intends to resume the sand fixation work it started in the 1930s and more firmly establish the dunes.'

To the Outer Bankers whose property was constantly threatened by the sea and to the National Park Service officials who administered these seventy five miles of narrow barrier islands, these words, with the passage of time and the expenditure of money, became a commitment a commitment to a beach erosion control policy that would protect the eight villages located within the Cape Hatteras National Seashore from the waves and wind, from hurricanes and northeasters. (246)

Robert Behn and Martha Clark have traced the evolution of this policy through its final amendment in 1978 (246). The research which changed this policy did not occur, however, until after Wirth left the Directorship.

Conferences

The second servicewide science and resource management conference was held in 1956 (131). The following year the first Everglades Research Conference was held, thus initiating a series of park and regional science and resource management conferences which continue through today. The Everglades conference, together with an increased interest in the hydrological problems of Everglades National Park, stimulated the growth of the science staff at the park. Bill Robertson, an ornithologist, had been working at the park for a number of years (124). Between 1963 and 1964 a biologist and an hydrologist were added to the staff.
Emergence from the "Eclipse"

The time was ripe for consolidation and re-orientation of the Service's natural resources management programs. The Service had expanded in terms of types of resources it was managing. Mission 66 was nearing its end and vexing resource problems had come to the forefront with wildlife management at the top of the list.

Relief would come through three principle actions. These were the alteration of policy on natural resources management with emphasis on wildlife management based on the Leopold Report; renewed emphasis on natural science as a result of the Robbins Report; and the emergence of a larger science staff and increased funding.

The Leopold and Robbins Reports

From the close of World War II to about 1960, a gradual ground swell of concern over the natural resources in the National Park System was developing. This interest peaked during 1961 and 1962 when a series of events occurred.

In 1961, the Advisory Board on National Parks, Historic Sites, Buildings and Monuments called for the expansion of the Service's research program into the multi-faceted field of natural history (40). In 1962, Stewart Udall, Secretary of the Interior, wrote to the President of the National Academy of Sciences expressing concern over the lack of a "coordinated or long range" research program within the Service (40). In addition, the elk population of Yellowstone National Park had been
rising steadily for a number of years with attendant controversy over control measures. By 1961 – 1962 there were 10,000 elk in Yellowstone on a winter range that would support half that number.

The combination of these events undoubtedly spurred Secretary Udall on to appoint two special Advisory Boards. One on wildlife management and the other on research. The Advisory Board on Wildlife Management was chaired by A. Starker Leopold and it submitted its report to the Secretary on March 4, 1963. The Advisory Committee on Research was chaired by William J. Robbins. This Committee also submitted its report in 1963. (40, 39)

These two documents had two common features. First, they addressed issues decisively and professionally. Second, the recommendations of the Boards were fully accepted by the Service and their implementation had sweeping effects on natural resources management policy and operations for two decades. Because these reports are true landmarks in the management of park resources within the System, their recommendations are cited here in their entirety. First the Leopold Report:

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

   Management may involve active manipulation of the plant and animal communities, or protection from modification or external influences.

2. Few of the world's parks are large enough to be in fact self regulatory ecological units; rather, most are ecological islands subject to direct or indirect modification by activities and conditions in the surrounding areas. These influences may involve such factors as immigration and/or emigration of animal and
plant life, changes in fire regime, and alterations in the surface or subsurface water.

3. There is no need for active modification to maintain large examples of the relatively stable "climax" communities which under protection perpetuate themselves indefinitely. Examples of such communities include large tracts of undisturbed rain forest, tropical mountain paramos, and artic tundra.

4. However, most biotic communities are in a constant state of change due to natural or man caused processes of ecological succession. In these "successional" communities it is necessary to manage the habitat to achieve or stabilize it at a desired stage. For example, fire is an essential management tool to maintain East African open savanna or American prairie.

5. Where animal populations get out of balance with their habitat and threaten the continued existence of a desired environment, population control becomes essential. This principle applies, for example, in situations where ungulate populations have exceeded the carrying capacity of their habitat through loss of predators, immigration from the surrounding areas, or compression of normal migratory patterns. Specific examples include excess populations of elephants in some African parks and ungulates in some mountain parks.

6. The need for management, the feasibility of management methods, and evaluation of results must be based upon current and continuing scientific research. Both the research and management itself should be undertaken only by qualified personnel. Research, management planning and execution must take into account, and, if necessary, regulate, the human uses for which the park is intended.

7. Management based on scientific research is, therefore, not only desirable but often essential to maintain some biotic communities in accordance with the conservation plan of a national park or equivalent area. (39)

The report goes on to make two other very important statements:

As a primary goal, we would recommend that the biotic associations within each park be maintained, or where necessary recreated, as nearly as possible in the condition that prevailed when the area was first visited by the white men. A national park should represent a vignette of primitive America....

Some management methods now in use by the National Park Service seem to us potentially dangerous. For example, we wish to raise a serious question about the mass application of insecticides in the control of forest insects. Such application may (or may not) be justified in commercial timber stands, but in a national...
park the ecologic impact can have unanticipated effects on the biotic community that might defeat the overall management objective. It would seem wise to curtail this activity, at least until research and small scale testing have been conducted. (39)

While the Leopold Report provided a philosophical basis for natural resource management activities, the Robbins Report supplied the agency with a series of definitive recommendations to improve the quality of research in the Service.

1. The objectives or purposes of each national park should be defined.
2. The natural history resources of each park should be inventoried and mapped.
3. A distinction should be made between administration, operational management, and research management.
4. A permanent, independent, and identifiable research unit should be established within the National Park Service to conduct and supervise research in natural history in the national parks and to serve as consultant on natural history problems for the entire National Park System.
5. The research unit in natural history in the National Park Service should be organized as a line arrangement, with an "Assistant Director for Research in the Natural Sciences" reporting to the Director of the National Park Service.
6. Most of the research by the National Park Service should be mission oriented.
7. The National Park Service should itself plan and administer its own mission oriented research program directed toward the preservation, restoration, and interpretation of the national parks.
8. Research should be designed to anticipate and prevent problems in operational management as well as to meet those which have already developed.
9. A research program should be prepared for each park.
10. Consultation with the research unit in natural history of the National Park Service should precede all decisions on management operations involving preservation, restoration, development, protection and interpretation and the public use of a park.
11. Research on aquatic life, on and above the land, should be pursued to assist in determining general policies or the maintenance of natural conditions for their scientific, educational, and cultural values.
12. Research should include specific attention to
significant changes in land use, in other natural resource use, or in economic activities on areas adjacent to national parks likely to affect the parks.

13. Research laboratories or centers should be established for a national park when justified by the nature of the park and the importance of the research.

14. The results of research undertaken by the National Park Service should be publishable and should be published.

15. Additional substantial financial support should be furnished the National Park Service for research in the national parks.

16. Cooperative planning as a result of research should be fostered with other agencies which administer public and private lands devoted to conservation and to recreation.

17. Universities, private research institutions, and qualified independent investigators should be encouraged to use the national parks in teaching and research.

18. Consideration should be given to including in the budget of the National Park Service an item for aid to advanced students who wish to conduct research in the national parks.

19. A Scientific Advisory Committee for the National Park Service should be established, and Scientific Advisory Committees for individual parks are desirable.

20. Action in implementing the recommendations of the present Committee's report should be taken promptly. (40)

As will be seen, almost all of the recommendations of these two reports were implemented within approximately two years.

Reorganization

On February 4, 1963, the number of research biologists was restored to eight - the highest since the reorganization of 1958 - with the addition to the WASO staff of Dr. Robert M. Linn from Isle Royale. He was the first plant ecologist among Service biologists since Dr. W. B. McDougall. Meanwhile management biologists in the expanding Division of Ranger Activities had reached a total of 15 or more. (199)

As a direct result of the Robbins Report, the natural science program of the Service was bolstered.

In December 1963, as a result of another reorganization, Ben Thompson who had long been in charge of the
Service's program of new park establishment, was made Assistant Director of Resource Studies (Research). He redoubled the efforts of the staff to justify an increase in the research budget. In 1964 several years of intense research budget justifying were rewarded by an increase from the previous $29,000 to approximately $80,000 for financing research projects. (199)

At the same time that the research biologists were removed from the Division of Interpretation, the interpretive staff that was left in that Division received a new divisional name (Division of Natural History).

About one month after these realignments were implemented, Director Wirth resigned. Needless to say, the efforts of the newly formed science staff would not be realized until George Hartzog's administration.

Other Important Events

In addition to the release of the Leopold and Robbins Reports and the establishment of a natural science program, momentum was building in the overall natural resource management program of the agency. Following is a list of a few of the activities agency personnel were involved with:

1. The first formal call for annual and long range (five years) wildlife management plans appeared on December 23, 1963. (151)

2. Revitalization of the "research reserves" program in the parks via a policy issuance on April 15, 1963. (157)

3. On March 25, 1963, a list of research facilities in the parks was prepared by Robert Rose, Research Geologist. The list included:
   - Mammoth Cave – proposed center
   - Hawaii Volcanoes – U. S. Geological Survey
   - Grand Teton – University of Wyoming
   - Yellowstone – proposed center
4. A renewed interest in aquatic life forms was sparked with the assignment of Orthello Wallis as an Aquatic Biologist to the Washington Office. On March 26, 1963, he prepared a brief document in which he called for a comprehensive evaluation of aquatic resources, preparation of a fishery management handbook, preparation of a series of publications aimed at interpretation of aquatic life and development of a treatise for inclusion in the "Fauna Series" titled "Fishery Resources in National Parks." (151)

It is obvious from these events that even prior to the release of either the Leopold or Robbins Reports, the Service was beginning to take positive steps toward improving the natural resource management program of the agency.

Threats Continue

As with previous administrations, threats to the integrity of park resources existed throughout much of Wirth's administration. Interest was renewed in the lumber of Olympic National Park. The California State Water Resources Board proposed control over all surface waters in the state and the diversion of water to locations where it was needed. This included park waters. In 1953, Katmai National Monument was inadvertently opened to pumice mining and claims were being actively worked in Joshua Tree, Death Valley and in Grand Canyon throughout the period. (187)

Perhaps as a result of these and other threats, or, perhaps as a result of the many changes which the Park Service and System had undergone since World War II, Interior Secretary
Udall called for an assessment of the ecological health of the parks in 1962. The survey was done by Dr. F. Fraser Darling and Noel D. Eichhorn, both from the Conservation Foundation. Their research effort extended well beyond Conrad Wirth's Directorship. It will therefore be addressed at a later point.

Policies

Wirth's administration began construction of the bridge which brought Service policies related to natural resources up to par with the thinking of the nation's scientific community. Completion of that bridge did not actually occur until the closing years of the next Director's administration.

During Wirth's administration, a voluminous set of "Administrative Manuals" was prepared containing policies on a host of subjects. These documents were supplemented by handbooks and field orders which addressed rather specific topics. (146) Development of this material was probably a reflection of the increasing complexity of the Service, the System, and the Federal government.

The wildlife management policies of the Service were changed drastically by the Leopold Report. It should be noted however, that the record indicates a void in written wildlife management policies following World War II. Presumably the policies of George Wright were still in effect, but, on a practical basis, field personnel appeared to have been left on their own in this area. Early in the 1960s, this situation was rectified with
the preparation of written policies. Those policies are included in the Appendix.

In addition, policies concerning the strict protection of scientific reserves were issued, a guideline on bear management was developed, firm policies against water resource development were set and a rather obscure policy on the uniform use of common and scientific names of fauna and flora was released. (151)

No documentation was found of any change in policies related to forest management despite the concerns expressed in the Leopold Report. Throughout Wirth's administration, forest fire suppression and forest insect and disease control continued to be actively practiced.

Wirth's Retirement

Conrad Wirth resigned as Director on January 8, 1964. His personal account of the circumstances of his resignation indicates that it came amid conflicts between he and the Secretary and Assistant Secretary of the Interior. Although those conflicts may have contributed to Wirth's desire to leave the position, it is far more likely that he was ready for retirement. (203) The number of programs which Wirth started during his career was enough to make anyone seek retirement.

In typical Wirth style, one final program had to be inaugurated.

It was the first part of August, 1962, when, in anticipation of retiring at the end of 1963, I felt it would be well to organize a task force to review Mission 66 and lay the groundwork for a program to follow it. They were to analyze very carefully what we had done and
weigh changes that had taken place in travel habits of the people; increased travel impact on the parks; types of equipment being developed for recreational use, especially camping; and everything that might affect policies we should consider for future programs. We named this study and report "The Road to the Future." While I had it in mind to have this material ready for the new director if I retired, I did not say so. I stated that the main purpose of this examination was to give us at least two years to prepare a program that we could put into effect starting July 1, 1966, so that there would be no lag in our progress after Mission 66. (203)

The "Road to the Future" was announced at the annual Superintendent's Conference held in Yosemite National Park in October of 1963.

There are six major "objects" or ends toward which the National Park Service directs its program under the Road to the Future. While they are not finite, because they change as people change, their stability is established and assured by the fundamental processes of national government.

Objective One

To provide for the highest quality of use and enjoyment of the National Park System by increased millions of visitors in years to come.

Objective Two

To conserve and manage for their highest purpose the natural, historical and recreational resources of the National Park System.

Objective Three

To develop the National Park System through inclusion of additional areas of scenic, scientific, historical and recreational value to the nation.

Objective Four

To participate actively with organizations of this and other nations in conserving, improving and renewing the total environment.
Objective Five

To communicate the cultural, inspirational and recreational significance of the American heritage as represented in the National Park System.

Objective Six

To increase the effectiveness of the National Park Service as a "people serving" organization dedicated to park conservation, historical preservation and outdoor recreation. (185)

Summary

An examination of Wirth's administration reveals an interesting response to problems related to park resource management. The primary observation is that Wirth placed tremendous emphasis on improving visitor facilities and park administrative facilities during the vast majority of his administration. The eclipse, which overshadowed the biological program of the agency starting in 1939, continued during Wirth's Directorship. Between 1960 and 1963, the administration undertook some major evaluation of priorities and the agency's biological program began to emerge from the eclipse. Unfortunately, improvements did not come on all fronts of resource protection.
Chapter 8
THE HARTZOG YEARS

A Fresh Outlook

Like his predecessor, George B. Hartzog, Jr. was well prepared to assume the helm of the Service. He had worked in Rocky Mountain and Great Smoky Mountains National Parks and had been the Superintendent of Jefferson National Expansion Memorial in St. Louis. In 1963, he was appointed Associate Director (203). William Everhart has described Hartzog in the following terms:

Not at all slavish about following established procedures, he refreshed the outlook of a tradition loving organization with a constant stream of fresh ideas. Perhaps more important, he knew how to make the ideas work. Trained in law, he had a sure knowledge of the ways of politics and politicians that helped him achieve legislation and appropriations from Congress on an unprecedented scale. (179)

Hartzog in Action

True to form, George Hartzog followed through with two major programs which affected almost every corner of the Service. Both of these programs were tied to the outlook of Wirth's "Road to the Future" and, in turn, they were closely linked with one another.

In 1965, Hartzog proposed a new program titled "Centennial Mission." It appears that this program was a direct descendent from "The Road to the Future." It is only natural that a new Director would want to initiate his own program; even if it was in name only. This effort was to pick up where Mission 66 left
off and was to culminate in 1972, the National Park Centennial. By 1966, this "Centennial Mission" had evolved into what is now known as "Parkscape USA." "Parkscape USA" had the following goals:

1. Completing the National Park System by 1972, a program of enormous scope - in effect, a Master Plan for the System - which has been endorsed by President Johnson.
2. Utilizing the National Park concept as a vital means of helping American cities to achieve handsome, livable urban environments.
3. Communicating the values of park conservation so that our citizens may better appreciate their heritage, to the end that all of us learn to live in better harmony with our environment.
4. Developing cooperative programs with other organizations and, together, approaching the new problems of outdoor recreation on the broadest possible front.
5. Extending assistance to - and exploring mutually helpful programs with - other nations through an international exchange of conservation knowledge with the goal of a second World Conference at Yellowstone and Grand Teton in 1972. (150)

This initiative laid the groundwork for the Service to move into environmental education, urban recreation area management, and preparation of a National Park System Plan based on historical and natural history themes. Each of these endeavors had implications on natural resources management within the agency. Some of the results included a closer working relationship between park naturalists and resource managers, management and restoration of highly disturbed areas and a renewed outlook on natural areas as part of an ecological "system." On March 13, 1968, George Hartzog announced "A Plan of Cooperation for Environmental Conservation" at the North American Wildlife and Natural Resource Conference. This plan outlined the
Hartzog also sought to streamline the agency. In 1969, he abolished most of the Service's handbooks and manuals and stated,

In lieu of handbooks and Administrative Manuals, a 'systems oriented' type of management - **Management by Objective** - has been instituted that provides a sound basis for the local manager to develop today's action programs in the light of the present needs of the still growing National Park System (150).

Although some aspects of this system remained in use by the Service after Hartzog left the Directorship (long range planning, role and function statements, and management by objectives), the lack of specific direction on many programs appears to have created some problems in park management. Between 1975 and 1985, over fifty new handbooks were issued to address those needs.

**Environmental Concern in the Forefront**

Hartzog's efforts to break from tradition were in keeping with the social/political pattern that developed during the 1960s. Defiance and political activism became commonplace. An enormous information explosion confused and fueled the unrest.

Underlying all these widening concerns of the 1960's and early 1970's was a growing national conviction that partial conservation programs, however meritorious, were inadequate to meet modern problems. The fabric of life, it was finally realized, is seamless. This conviction grew as millions of Americans saw with their own eyes the steady spread of air and water pollution in their own neighborhoods to levels hazardous to life. The intolerable consequences of dramatic offshore oil spills, deadening smog, filthy rivers, and diminishing open space were evident on every hand. Scientists announced that the very foundations of life on earth were in jeopardy because of the profound impact of modern technology on the total ecology of the globe.
But among all the factors that forced Americans to turn their full attention to the life giving qualities of their environment, none equalled the landing on the moon. The truth came as a revelation. Viewed from outer space, the planet earth is a small green orb in an apparently lifeless immensity and man's only home. (189)

One response to this concern about the quality of the nation's resources was the passage of a number of environmental laws. Some of those laws were the Wilderness Act and the Land and Water Conservation Fund Act of 1964, the Federal Water Pollution Control Act of 1965 (amended in 1972), the Water Resources Planning Act, also of 1965, the Air Quality Act of 1967 (amended in 1970), the Wild and Scenic Rivers Act and the National Scenic Trails Act, both of 1968, the National Environmental Protection Act of 1969, the Coastal Zone Management Act of 1972, the Federal Environmental Pesticide Control Act of 1972, and the Marine Protection, Research and Sanctuaries Act of 1972 (189,146). Each of these acts had direct effects on the management of park resources but, most importantly, they required more careful scrutiny of park operations and of the effects those operations were having on the environment.

Another response was the inauguration of the "New Conservation" by President Johnson.

In 1965, President Lyndon B. Johnson convoked the White House Conference on Natural Beauty, which gave new emphasis at the highest levels of government to the importance of aesthetic values, primarily natural but also cultural. In the ensuing years, under Mrs. Johnson's leadership, the natural beauty movement spread from Washington, D. C. - where important aspects were demonstrated in National Capital Parks for all the nation to see - to States and communities all over America. Historic preservation became part of the "New Conservation" with enactment of the highly important National Historic Preservation Act in 1966. Among other
important steps he took to extend and deepen the "New Conservation," President Richard M. Nixon launched his Legacy of Parks program and proposed World Heritage Trust in 1971. (189)

**Park Legislation**

Between 1964 and 1972 the National Park System experienced unusual growth. Under the leadership of Director George B. Hartzog, Jr. and Secretaries of the Interior Stewart L. Udall, Walter J. Hickel, and Rogers C. B. Morton, 62 areas were authorized, added to the System, or given new status, in eight years. (189)

Important features of this expansion included the addition of two sites containing fossil beds, the Biscayne Bay area, the Guadalupe Mountains of Texas, eight seashores and lakeshores, three scenic riverways, eight reservoir related recreation areas, and two urban recreation areas which contain significant natural resources. A rather impressive array.

**Organized and Reorganized**

During the nine years of the Hartzog administration, reorganization of the Washington Office occurred on several occasions. No doubt some of this was due to Hartzog's management style but, much of it was a response to the increasing complexity of park operations and of the Park System itself.

**Natural Science**

Just prior to Wirth's resignation, a Division of Natural History and an Office of Natural Science Studies were created. The Division of Natural History was the direct descendant of the Branch of Natural History in the old Division of Interpretation. The function of this new Division was solely interpretive while
the Office of Natural Science Studies was given the responsibility for natural science research.

As indicated in the previous chapter, Ben Thompson served as the Assistant Director for Resource Studies over the Office of Natural Science Studies. In December of 1964, Ben Thompson retired and Howard Stagner took his place as Assistant Director.

... In 1964 several years of intense research budget justifying were rewarded by an increase from the previous $29,000 to approximately $80,000 for financing research projects. Though still laughably small in the eyes of scientists on the outside, the pump priming effects of this increase made possible a total of 47 research projects that were wholly or partly financed by the Service.

In May 1964, in conformance with the Wildlife Management Committee's and the National Academy's reports, and the specific recommendations of influential scientific advisors in and outside of the Department, Dr. George Sprugel, Jr. was appointed Chief Scientist of the newly reorganized Division of Natural Science Studies. He was to be "responsible for the overall formulation and staff direction of a Service wide natural history study program (research)...".

With characteristic energy, Sprugel organized WASO and park biologist and naturalist staffs, and panels of nationally prominent natural science authorities, into study teams which met in the parks to survey the ecological problems there. From on the spot information so obtained, the teams then formulated Natural Sciences Research Plans tailored for each park which outlined the research needed to adequately inventory and appraise the condition of the natural resources, and to provide information required by management to restore and protect that particular park. (199)

George Sprugel continued to act as Chief Scientist until 1966, when he retired. He was succeeded by Dr. A. Starker Leopold in October of that year. Dr. Leopold was employed under special terms which meant that a Deputy Chief Scientist needed to be appointed. Robert M. Linn was chosen for this new position.

1967 brought further refinement to the organization of
these two groups (the scientists and the naturalists). That year the Division of Natural History became known as the Division of Interpretation and Visitor Services under an Assistant Director for Operations. This new Division still exists today. At the same time, the position of the Assistant Director for Resource Studies was abolished, leaving the Chief Scientist directly accountable to the Director.

When Dr. Leopold resigned, Robert Linn became the Chief of the Office of Natural Science Studies. Key scientists of this period were: Orthello Wallis as an aquatic biologist, E. Lowell Sumner as a biologist, and Robert Rose as a geologist. Robert Rose retired in 1969 and his position as a geologist has never been filled.

Finally, in 1971, the Office of Natural Science Studies was placed under an Associate Director for Professional Services. Regional Chief Scientists were appointed for the first time in 1971 (Figure 9).

Nicholas Chura - Northeast Region
James Larson - Southeast Region
Orthello Wallis - Western Region
Jim Reid - Midwest Region
Garrett Smathers - Pacific Northwest Region
Gary Clemons - Ecological Services Laboratory

Figure 9
REGIONAL CHIEF SCIENTISTS
1971

Source: Management Biology File, National Park Service Archives, Harpers Ferry, West Virginia.
These first Regional Chief Scientists came from the Washington office. In the months and years that followed, field personnel were placed in these positions. Other appointees included Roland Wauer, Ray Herrmann, and Bob Stottlemeyer.

Creation of these regional positions is of great significance, as this is the first time, since the 1930s, that responsibility for science programs was decentralized.

The research arm of the Service was intended to have a small central office staff and a cadre of field research biologists, who had territories in the Park System for which they were responsible. At one time, the appointment of as many as 40 field biologists was recommended. In that same proposal, Robert Linn discussed the need for the development of a career ladder for these scientists as well as a two year training program. Both are still valid issues.

Growth in this group of scientists was steady during Hartzog's administration. In 1968, a social science program was added to the natural science program and on November 3, 1968 the Plant Pathology Laboratory of the National Capital Parks was transferred to the Office of Natural Science Studies. At the time of the transfer, three scientists were on the staff (Horace Wester, Plant Pathologist; Albert Lawson, Horticulturalist; and James C. Patterson, Agronomist). Concerns of this lab were predominantly with urban soils, urban forestry and ornamental management. About 1971, this lab changed its name to the Ecological Services Laboratory (ESL).

A distribution list, for a monthly bulletin produced by
the Office of Natural Science Studies, shows a maximum of 35 scientists, most of whom were in field assignments (Figure 10) (151).

**Natural Resources Management**

The author's research has only provided a rough outline of the organizational charts for this arm of the agency during the 1960s. By 1963, the Division of Ranger Activities had two Branches in it concerned with natural resources management; a Branch of Forestry and a Branch of Wildlife Management.

In 1967, this Division became the Division of Resource Management and Visitor Protection under the Assistant Director for Operations. This new Division also had two Branches concerned with resource protection activities.

The Branch of Wildlife Management is responsible for formulation of standards and procedures relating to biological activities which arise incident to the management, conservation, and protection of wildlife and fish. It provides overall staff direction, and coordination of Servicewide management and investigation programs in matters involving all wild mammals, birds and fish regardless of how they may be classified as to predator or prey, game or nongame, sport or nonsport fish, native or exotic and feral wildlife, beneficial or detrimental.

The Branch of Park Protection has prime responsibility for managing the lands, vegetation, water and natural features as well as the historical, archeological and other manmade features and facilities. (185)

A briefing statement, prepared by Francis A. Jacot, who may have been the Chief of the Branch of Wildlife Management, dated December 3, 1965, indicates that the Branch had a staff of four including the Branch Chief, an Aquatic Resources Biologist, a Habitat Ecologist and a Management Biologist. Three regions had individual Management Biologists (Midwest, Southwest, and Western) while the Northeast and the Southwest Regions shared
Maurice Sullivan - National Capital and Northeast Regions
William B. Robertson, Jr. - Everglades
John C. Ogden - Everglades
Walter H. Kittams - Carlsbad Caverns and Big Bend
Glen F. Cole - Grand Teton and Yellowstone
James K. Baker - Joshua Tree, Death Valley and Channel Islands
Richard M. Brown - Crater Lake, Lassen Volcanic, Oregon Caves and Lava Beds
E. Lowell Sumner - Washington office
Alan H. Robinson - Virgin Islands
William J. Barmore - Yellowstone
C. Robert Wason - Glacier
Richard Riegelhuth - Sequoia and Kings Canyon
Richard G. Prasil - Anchorage
Richard W. Klukas - Everglades
William H. Hendrickson - Yellowstone
Douglas E. Houston - Grand Teton
Clifford J. Martinka - Glacier
Warren F. Steenbergh - Saguaro and Organ Pipe
Garrett A. Smathers - Hawaii Volcanoes
Max W. Holden - Mt. Rainier
L.K. Thomas - National Capital Region
Derrick C. Cooke - Carlsbad Caverns
David R. Stevens - Rocky Mountain
Peter S. Hayden - Glacier
Bruce M. Kilgore - Sequoia
Charles C. Hansen - Death Valley
Robert H. Rose - Washington office
Bruce B. Moorhead - Olympic
Mary Meagher - Yellowstone
Neal G. Cuse, Jr. - Yosemite
Steve P. Viers - Redwood
Lloyd L. Looke - Grand Teton
A.R. Weisbroad - Seattle
Donald Field - University of Washington

Figure 10

OFFICE OF NATURAL SCIENCE STUDIES
STAFF AND DUTY STATIONS
LATE 1960s

Source: Management Biology File, National Park Service Archives, Harpers Ferry, West Virginia.
No information was found on the organization of the Branch of Park Protection. Presumably the staff from the Branch of Forestry, of the old Division of Ranger Activities, was absorbed under this new title.

The first use of the term "Resources Management Specialist" appeared in 1969 and was applied to field rangers who had resources management responsibilities. In 1972, just prior to Hartzog's departure, the Division of Resource Management and Visitor Protection was absorbed into an Office of Park Operations under an Assistant Director for Park Management.

Lands Management

As with the resource management organization, very little documentation exists which traces the evolution of the land management organization. Sometime in the early 1960s, perhaps about 1963, a Land and Water Rights Office was established under an Assistant Director for Specialized Services. It appears that this new office descended from the Lands Division which was created in 1952.

In 1967, the Land and Water Rights office became a Division under the Assistant Director for Operations. In 1972, as was done with the Division of Resource Management and Visitor Protection, the Land and Water Rights Division was placed under an Assistant Director for Park Management. Its name was also changed to the Land Acquisition Division.

Mining and Minerals

For the first time in Service history, a Branch of Mining
and Minerals was created in 1971. The initial group was small and was scattered around the country in Spokane, Washington, Denver, Colorado and Salt Lake City, Utah. The Branch Chief, David Jones, was stationed in the Western Regional Office in San Francisco, California. It is unclear exactly where this Branch fell within the Service's overall organization. (146)

**Budgets**

Funding for natural resources management and natural science research increased significantly during Hartzog's administration. The 1964 research budget was $80,000. That moved up to $105,500 in 1965 and to $177,000 in 1967 (199). In 1965 alone, 2.4 million dollars were appropriated for forestry and fire control, pest control, White Pine Blister Rust control and soil and moisture conservation. That figure was increased to 2.5 million in 1966. (82)

**Servicewide Programs**

As mentioned previously, the 1960s were explosive in terms of environmental awareness and management. It was also an expansive period for the Service in terms of personnel and funding for natural science and natural resources management. These two facts combined and resulted in tremendous increases in the number of and complexity of resource management and science programs undertaken by the Service. Only a few of the highlights will be discussed.
Publications and Planning

Despite Hartzog's dislike for administrative manuals, many of them related to natural resources management were produced during the 1960s. Foremost among those documents was the Natural Sciences Research Handbook, first released in 1965. (103,104) This handbook outlined the basis for research in the National Park System and set forth the guidelines for the preparation of Park Natural Sciences Research Plans. (165)

... The first of these plans was the Isle Royale National Park Natural Science Research Plan completed in March 1966. Shortly to follow was the Everglades National Park Natural Sciences Research Plan in September 1966. Research plans were completed with Haleakala National Park Natural Science Research Plan being the last in January 1969.... (165)

While the research staff was devoting attention to research plans, the resources management staff worked on documents which addressed day to day resource activities and concerns.

The resources group made serious efforts at resources management planning within the same year (1963) of the Leopold Report in the form of A Back Country Management Plan for Sequoia and Kings Canyon National Parks.... By October 14, 1965 the first guidelines were issued for preparing Resources Management Plan. These clearly stated that the plans were to implement the recommendations of the Leopold Report with special emphasis on habitat and extirpated species restoration. In achieving this and other management goals, the program was to consist of a compilation of earlier research applicable to local conditions, and to develop a research program aimed at providing answers to management problems....

In July 1968 the 1965 guidelines were replaced by the Natural Resources Management Handbook which established the guidelines for preparing a Resources Management Plan for each park. It emphasized that the resources management plan should 'flow' from the master plan, based on an ecological analysis of the natural resources
and management objectives for these resources. Amendment No. 1 of January 1969 specified under Research that if a park already had a Research Plan, it should be incorporated in the Resources Management Plan. (165)

This 1968 handbook was intended to provide direction on the full gamut of topics including wildlife, soil and moisture, vegetation, toxic chemicals, aquatics, specimen collection, water rights, special uses, boundary surveys and resource management planning. Many of these sections were never released or even written. (102)

Management soon became aware that the research resources management programs were not coordinated, nor interdependent as of earlier times. In 1970, the Resources Management Planning function was transferred to the Office of Natural Science Studies, wherein the Natural Science Research Plan and Resources Management Plan were to be combined into one plan.

Dr. Robert Linn, ..., began to develop a set of new guidelines that would integrate the two plans into a Natural Resources Management Plan. Since the beginning of both the research and resources management planning activities, funding for approved plan projects and activities had either been insufficient or not programmed. Thus, one objective was to produce a plan that would be programmed and budgeted on a timely basis. By 1971, Linn's office had completed a draft of the proposed new guidelines. The new plan was to be basically a one page programming document with supporting appendices that identified five years in advance, needed projects, specific funding, and manpower needs, and established a system for assignment of priorities. A basic data package, which consisted of all known data on the park resources (later to be known as Resources Basic Inventory — RBI), was used in preparing the plan. However, before he could put the guidelines into use, his office was reorganized in the fall of 1971 into seven Regional Chief Scientist positions.... As a result resources management planning responsibility was then transferred from Washington to the Regional Offices. By 1972 the regions had begun to develop their own guidelines for preparing the resources management plan. Some, such as the Pacific Northwest Region, relied heavily upon the original draft and guidelines prepared by the Chief Scientist's office, but expanded on the use of an interdisciplinary team effort in preparing the plan, and followed a methodology of problem
recognition by evaluating the park ecosystems in light of its purpose, objective, and present and planned developments.... (165)

Interim guidelines for the management of wildlife resources in recreation areas were issued in 1965 (88). These were to be followed by a three part handbook which never fully materialized. Titles of these parts were to be "Wildlife Resources, Natural and Historical Areas," "Aquatic Resources, Natural and Historical Areas," and "Wildlife and Aquatic Resources, Recreational Areas." The only one of the three to be published was "Aquatic Resources, Natural and Historical Areas," which appeared in 1966 (117). An extensive "Fire Control Handbook" was first released in 1964, with later releases in 1968. A "Fire Administration Guideline" appeared in 1971.

In addition to these handbooks, the Chief Scientist began publishing "Annual Reports" in 1968. These continued until about 1975. (43,44,45) The Chief Scientist also initiated a newsletter describing the activities of the various research biologists which were scattered around the System. This was titled "Natural Resources" and was produced between 1967 and 1971.

Finally, the "Fauna Series" had yet another entry. In 1966, L. David Mech published The Wolves of Isle Royale. (23)

Natural Landmarks Program

The Natural Landmarks Program was designed as a mechanism for the preservation of natural sites of outstanding scientific importance. Authority for the development of such a program stems from the Historic Sites Act of August 21, 1935, but, the
Service did not pursue establishment of the program until 1962.

Efforts to establish a Natural Landmarks Program began in late 1961 within the Division of Natural History. The Nature Conservancy and the American Geological Institute assisted greatly both in formulating criteria and guidelines for selection of sites in compiling an extensive list of sites for consideration. Guidelines were developed for evaluating sites as to their quality, and feasibility. Four sites were recommended for registration in March and an additional three in November 1963. Mianus River Gorge in New York State became the first Registered Natural History Landmark on April 1, 1964, followed by Corkscrew Swamp Sanctuary, Florida; Rancho La Brea, California; Wissahickon Valley, Philadelphia, Pennsylvania; Elder Creek, California; Fontenelle Forest, Nebraska; and Bergen Byron Swamp, New York.

To reduce confusion between this program and the Registry of National Historic Landmarks Secretary Udall approved a change in the title of the program from National Registry of Natural History Landmarks to National Registry of Natural Landmarks on February 26, 1965. (146)

As of 1983, 52 volumes had been prepared which identify potential additions to the National Registry.

Natural Sciences Advisory Committee

On January 25, 1964, this committee was established "to advise the National Park Service in all phases of its natural history research program" (39). The original committee members were Dr. A. Starker Leopold, Dr. Stanley A. Cain and Dr. Sigurd F. Olson. Dr. Cain was replaced by Dr. Charles E. Olmstead when Cain was appointed Assistant Secretary of the Interior for Fish, Wildlife and Parks. (199) Much of the success which the Service had in developing it's natural science program was a result of encouragement by the members of this committee. The last act of this committee was the endorsement of Theodore Sudia as Chief Scientist in 1973 (127).
Research Natural Areas

In 1963, just prior to the release of the Leopold and Robbins Reports, the Service dropped the use of the term "research reserves" and substituted "scientific reserves" for it. These reserves were soon to be incorporated into a nationwide, interagency reserve system.

... President Johnson's "Special Message to the Congress on Conservation and Restoration of Natural Beauty" [was] presented in the early months of 1966. This message contained a directive to advance "our scientific understanding of natural plant and animal communities." This stimulated the formation of a review committee within the Departments of the Interior and Agriculture to evaluate the status of natural land and water resources within the respective agency programs. Further impetus came from the imminent participation of the United States in the International Biological Program (IBP) which emphasized the analysis and conservation of ecosystems. As a result of these events, the Federal Committee on Research Natural Areas was informally established in 1966.

The initial group of founding agencies was joined by other land administering agencies, namely, the Department of Defense, Atomic Energy Commission and the Tennessee Valley Authority. This group, with assistance from the IBP Committee on Conservation of Ecosystems, conducted a land review and transmitted the findings to the President in a report entitled Advancing Scientific Understanding of Natural Communities. This report outlined the need for a system of reserves representing the nation's natural land and water ecosystems. It also described the need for an interagency committee to coordinate natural area programs, and reported that 336 Research Natural Areas were available for observational studies.

In 1968, the Committee published A Directory of Research Natural Areas on Federal Lands of the United States of America which summarized the characteristics of 336 Research Natural Areas within the interagency system and provided guidelines for use of the areas. From 1969 until 1974 several unsuccessful attempts were made to formally house the Committee and its endeavors....

New interest was generated in 1974 with assistance and leadership from the National Science Foundation and the Council on Environmental Quality. In November, these two agencies fostered the charter of the Federal Committee on Ecological Reserves with the following
... the Bureau of Indian Affairs and the Tennessee Valley Authority have recently assumed membership as well....

In practice, the Committee has a special concern for Ecological Reserves which are those areas dedicated primarily or exclusively to scientific research and education on ecological and environmental problems. These reserves include Research Natural Areas, where natural processes are allowed to dominate and where management is designed to preserve a given ecosystem or feature; and Experimental Ecological Areas, where various kinds of experiments or management practices can be conducted to provide new knowledge or serve as demonstrations. (35)

At least fifty six of these areas can be found in the National Park System. In May, 1968, the Service published Chapter 9 of the Natural Sciences Research Handbook. This chapter addressed management of Research Natural Areas.

Conferences

As the size of the Service's natural science staff grew, the level of interest in and need for conferences increased. Two gatherings of researchers and resource managers occurred while Hartzog was Director. Both were held at the Albright Training...
Center in Grand Canyon National Park. The first was April 6-8, 1968; the second, April 18-20, 1970 (169,168). Only two other conferences of this type had been held previously in agency history.

Programs Linked to Issues

The Service was faced with a steady stream of resource related issues throughout the 1960s. This proved advantageous to the Service as it stimulated many programs and activities.

A large number of the research biologists hired during this period had specific issues they were supposed to address. An outstanding example of this is seen at Everglades National Park. In 1970, three resource managers/researchers were added to the park staff as a result of the jetport controversy in which construction of an airport was proposed immediately north of the park.

Wildlife Issues

During 1968 and 1969, litigation between the State of New Mexico and the Department of the Interior over wildlife research at Carlsbad Caverns National Park developed. The issue at hand involved the right of the Service to conduct wildlife research within the parks without being subject to State regulations. Obviously Wirth's opinion of five years previous was still being questioned. In June of 1969, it was reported that the U. S. Court of Appeals had ruled in favor of the Department and that the Secretary of the Interior was responsible for proper management of park wildlife populations. (151) Despite the
decision of the Appellate Court, this would remain a nagging issue for many years.

As follow up to the Leopold Report, Director Hartzog issued a lengthy memorandum on September 22, 1967, explaining how wildlife management policies were to be implemented. As might be expected, emphasis was placed on the management of ungulates. No public hunting was to be permitted in natural areas in the System; populations which needed control were to be controlled and indigenous or native species were to be protected and exotics eliminated.

Although no significant, direct influence was felt in the Service on the issue of predator control, two important reports appeared on the subject during Hartzog's administration. The same committee which produced the Leopold Report, published a report, in 1964, which was used by the Division of Wildlife Services of the Bureau of Sport Fisheries and Wildlife to establish predator control policies. Those policies were aimed at reducing the general elimination of predator populations (36). In 1971, the Council on Environmental Quality submitted yet another report to the Secretary of the Interior which essentially stated that no improvement had been made in reducing predator control. If nothing else, these reports served to reinforce the Service's policies on predator control which had been established decades previously. As with the issue of jurisdiction over park wildlife, the issue of predator control continued to vex the National Park Service.
Fisheries Issues

Fisheries management issues, although not highlighted like those of terrestrial wildlife, also seemed to bring about changes in programs.

An 'out of sight, out of mind' attitude with respect to aquatic resources has resulted in a general lack of full appreciation and understanding of the significance of undisturbed natural aquatic conditions and the forms of life they contain. Primary resource emphasis has been placed, in general, upon consumptive uses of the aquatic resources. This approach to a park resource is changing. Much can and is being done to give aquatic resources 'first class citizenship' in the family of park resources. Unfortunately, however, our knowledge about many of our aquatic resources is not adequate for the task of effectively fulfilling the Service's responsibilities for the management, perpetuation, recreational uses, and commercial uses (in some areas), and interpretation of these resources....

In its fishery management program, the Service is assisted in selected areas by biologists of the Bureau of Sport Fisheries and Wildlife. Two Bureau biologists are stationed in Yellowstone National Park and one is headquartered in Great Smoky Mountains National Park. The latter, also, conducts investigations in the Blue Ridge Parkway and Cumberland Gap National Historical Park. In several reservoir recreational areas, State biologists are conducting investigations that are generally sponsored wholly or in part by Federal funds. Generally, with these exceptions, fishery management investigations are being conducted by park personnel on a part time basis....

Research. The Service is currently sponsoring research through contracts in aquatic resources in various areas including: Death Valley National Monument (endangered desert fish species and habitat); Sequoia National Park (status of Kern River Rainbow and Golden Trouts); Grand Teton National Park (Snake River cutthroat trout); Glacier National Park (historical review of fishery resources); Everglades National Park (marine and freshwater ecology).

Marine Resources. The Service administers 20 major areas that are essentially marine oriented and a similar number of historical areas that are located in estuaries or adjacent to the sea. Consequently, we are greatly involved in many activities that are directly concerned with marine resources. These activities include:

1. National Marine Resources. A report or series of
reports are being prepared by the National Marine Council, headed by the Vice President, and the National Marine Commission, as authorized by Congress. The end result will be a report to the President and to Congress in which the Nation's future course in marine resources will be spelled out.

2. Department of the Interior Marine Resources Development Program. This consists of a composite of all the programs being conducted by agencies within the Department in the realm of marine resources.

3. National Estuarine Study. As required by the Clean Waters Act, the Federal Water Pollution Control Administration is conducting a national study of the country's estuaries.

4. Sea Grant Program. A national program of institutional support and project grants that is directed toward increasing the Nation's capabilities and knowledge in the oceans.

5. TEKTITE I Project. A man in the sea project in which four marine scientists will study and work under the ocean at a depth of 50 feet in or near a submerged habitat capsule for a period of 60 days. This project will be conducted within the Virgin Islands National Park and is jointly sponsored by NASA, Office of Naval Research, General Electric Corporation, and the Department of the Interior.

6. Expanding Opportunities for Underwater Observation. The Service has embarked upon a program to increase our capabilities to provide increased opportunities for underwater observation and interpretation.

Orthello Wallis wrote the following summary of the evolution of the agency's involvement in fish stocking activities and set the tone for the position of the Service in the early 1970s with regard to this practice.

From early years, fish planting has been widely conducted in national parks. With a general lack of full understanding and appreciation of the significance of natural and unmodified aquatic ecosystems, both native and exotic fishes have been planted and transplanted into waters that were originally barren of fish life and into waters containing endemic species. As a consequence, few waters and fish populations remain in national parks that have not been altered by stocking. With the era of fish culture, stocking was sanctioned for the purposes of replenishing fish stocks that had been reduced or depleted by fishing; maintaining
fish populations in waters in which conditions for natural reproduction were limited or absent; and creating new fishing waters by stocking waters that did not naturally contain sport fishes. Stocking of trout into isolated backcountry lakes and streams was used to entice visitors into remote areas of the park. Although none are located in national parks today, fish hatcheries operated in several parks in the past to provide an adequate supply of trout for stocking.

Fishes, mostly trouts, are still stocked in limited numbers in some national park waters to maintain fishing at desired levels and to restore native species. This practice however, is now carefully regulated and conducted in accordance with approved management plans in which the management objectives for each water are defined. At the present time, trout are not stocked in the waters of Yellowstone, Glacier, Crater Lake, Shenandoah and Rocky Mountain National Parks.

Prime consideration is directed toward species that are native to the individual water or drainage. Barren waters are not stocked. Numbers of fishes planted are regulated within the carrying capacity of the water and the anticipated fishing pressure. (173)

Forestry Issues

In addition, major changes in the management of park forests occurred during the Hartzog years. Around 1965, after Dr. Stanley Cain was appointed Assistant Secretary of the Interior, NPS policies regarding the control of forest insects and diseases were changed. Native insects and diseases were finally considered of equal value as native plants and animals and, were, therefore, no longer controlled. (199) By 1967, all beetle control efforts were ended at Grand Teton National Park (199). This may have been the last program to be suspended. Undoubtedly, this change in policy was tied to the Leopold Report and may have been influenced by the retirement of the professional foresters who were associated with John Coffman.

Philosophies about fire management were also changing. In May, 1972, a "Fire in the Environment" Conference was held in
... It drew fire specialists from Canada, Mexico, England, Australia, and the United States. All scientific facets of fire control were considered but the most interesting development was the militancy of the exponents of use of fire as a management tool as led by, surprisingly enough, the National Park Service.

The emergence of the Park Service as a militant spearhead for more controlled burning shocked some grizzled fire fighters and awed others. Parks people told how fire had been permitted to burn in some high altitude parklands for weeks and how everything was kept tidy and orderly, the ecology of the area was well served, and the park using public, when informed of what was going on, showed understanding. Others told how man has used fire as a tool for generations and how it must be considered an integral part of the picture in maintaining balanced ecosystems. To some this was strictly 'longhair' thinking. (258)

During this time, the Service was working closely with the Tall Timbers Research Station outside of Tallahassee, Florida on fire research and significant fire management programs were developing at Sequoia and Everglades National Parks. The first documented use of fire by the agency was in 1949, in the Everglades (147).

Safety

The safety of park visitors and its relationship to park resources took on increased importance during this administration. Several grizzly maulings occurred in Glacier National Park during 1967 and a nine year old boy died from falling into one of Yellowstone's thermal pools in 1970 (281). Incidents of this sort stimulated the Service's safety program and increased awareness of hazards associated with park resources. Joint efforts between the park resource managers, who provide the basic information about the resources, and the interpreters, who communicate that information to the public, have enhanced the Service's
approach to managing park visitors and natural hazards.

Other Programs

Dr. Robert Linn has indicated that the resource management programs of the Service blossomed during this period. Programs mentioned by him included barrier island management, selection of wilderness area criteria and management of grizzly bears and European Wild Boars. (127)

Robert Rose, who had served as the Service's sole Research Geologist and who later became the agency's Chief Geologist, was involved in the recently established Earth Resources Observation System (EROS) program. Secretary Udall announced this new program in September, 1966. Sometime in 1969, Rose retired. His retirement brought an end to a legacy. The Service has not had a Chief Geologist since.

In 1968, the scope of the natural sciences research program was broadened to include sociological research. This was probably related to the social trends of the period and the tremendous increases in numbers of park visitors.

Threats Continue

Most of the same threats, which have plagued the Service for decades, continued without resolution. The general ground swell of interest in environmental quality served to increase the frequency of discussion about these problems.

In the sixth edition (1969) of Devereux Butcher's Exploring Our National Parks and Monuments, a new chapter - 'Threat After Threat' - was added. There Mr. Butcher includes sections on 'dam building,' 'road building,' 'increasing misuse of the parks,' 'national
parks in name only,'architecture gone wild,' and 'menace of inholdings,' in presenting his views of park threats. (174)

Prominent in this list of threats was the use of off road vehicles, including snowmobiles, in the parks (253). Mining in the parks was also raised as an important concern (252). Resolution of these problems would not come until after Hartzog's administration.

The Redwood Experience

One of the true highlights of the Hartzog administration was the establishment of Redwood National Park. Although initial proposals for the creation of a Redwood National Park first appeared in 1920, no serious work on park legislation began until 1964. The park was finally authorized in October, 1968. During the four years between 1964 and 1968, logging operations continued intermittently in and around the park's boundary.

Some may view the campaign for a redwood national park as the last of a classic type of conservation battle. The subject matter involved certainly is among the last of a type. Yet the complex politics of the campaign suggests it may also be viewed as a harbinger of more sophisticated campaigns ahead. As an affirmative campaign for legislation sponsored by conservationists, it introduced a new generation of conservationists to the problems of advocacy. Leaders in the campaign had to worry about prevailing at every step in the legislative process. Wide popular support had to be developed. Probably as many as 40,000 people wrote their representatives during the campaign. That conservationists prevailed is proof that they learned the necessary lessons.

The final campaign for a redwood national park occurred at a time when the political and physical criteria favorable to such a campaign were out of phase. By standards of physical availability and suitability, the period for establishing a good redwood national park
was in the 1920s or 1930s, when some of the best forests were still intact. Though studies were made then and proposals formulated, the time did not seem right politically. Consequently, the national park campaign in the 1960s became something of a salvage effort directed at linking together the best virgin stands that had survived by chance.

The circumstance that a national park did not become politically feasible until after the best physical opportunities had already vanished caused many problems in launching the final successful effort. Most prevalent was the belief that there were no forests of sufficient magnitude surviving in the coastal redwoods to merit national park status - a theme vigorously promoted by the lumber companies, who maintained that all the best stands were protected in state parks. Finally, and most damaging of all, the Save the Redwoods League had lost hope in the idea.

President Johnson proudly signed the bill on October 2, 1968. As he did, most of the 28,101 acres of private land moved into federal ownership in probably the largest congressional condemnation in history. Never before had so many redwoods been saved with one single stroke of the pen.

The future of the most virgin east slope of Redwood Creek still remains in doubt. If it is not protected by being put into the park, the streamside corridor below it will not survive continual buffeting by erosion and wind. A further act of Congress undoubtedly will be needed to protect it, though it is the logical target for watershed easements.

So the race with the loggers continues. The final shape of the Redwood National Park remains unsettled, and as long as its boundaries remain 'gerrymandered,' many park visitors will continue to believe that they have been defrauded. They will be seeing, not a primeval forest, but remnant rescued by a desperate struggle.

What they will see will be better than nothing, but the nation could have done better. (288)

Creation of Redwood National Park presented a fascinating new set of natural resource management challenges not previously faced by the Service.

Unfortunately, the Redwood National Park is not made up of entire watersheds. To keep it within the 58,000 acre limitation imposed by Congress, only portions of the several watersheds involved could be included less than 50 percent of those drained by Lost Man Creek and Mill Creek and less than 10 percent of those drained by
Redwood Creek. By this action the fate of critical portions of the Park was left in the hands of private landowners controlling the remaining portions of these watersheds. Consequently, if the preservation objectives set forth by Congress are to be achieved, a cooperative management effort will have to be developed with these owners.

This problem prompted Congress to provide the Secretary of the Interior with authority to enter into contracts and cooperative agreements with these owners for management on their lands designed to protect the Park from any hazardous inputs that might be generated thereon. It also authorized the Secretary to enter into contracts to regulate the viewscapes along the corridor between Orick and Prairie Creek Fish Hatchery.

Preservation of the primeval redwood forest will require active intervention by man, who lives and views his accomplishments by a time scale ever so much shorter than the one the redwood lives and dies by. It will require continuing popular support extending from one generation to the next, which can be achieved only if an effective segment of the public fully understands the technical aspects of preservation. Redwood preservation will need to be viewed in the broad context of natural resource preservation, which includes preserving the redwood as an unexcelled source of wood as well as a key species in a priceless primeval forest park. (285)

Policies

Servicewide policies, as they developed under George Hartzog, became increasingly more complex. The single most significant change was the creation of three separate policy volumes (natural area, historical area and recreational area), each differing slightly from the others. This change was made to respond to the inherent differences in management of natural, historical and recreational units of the Park System. Although written policies had appeared in the administrative manuals of the 1950s, this was the first time policies became so elaborate and so formally presented. Furthermore, each of the three policy...
volumes was broken into three parts: (1) Resource Management, (2) Resource Use, and (3) Physical Developments. Specific resource management policies are far too lengthy to quote here, but, significant changes included oversight on construction and development projects by the Chief Scientist, recognition of native insects and diseases and acceptance of prescribed fire. The policies were also expanded to address topics such as research stations, air and water pollution, solid waste disposal, off-road vehicle use, mining and disposal of resources. Clearly NPS policies regarding natural resources management had responded to the demands of the times and addressed current management concerns in a much more comprehensive fashion. (38)

A decision to move in this direction [toward applied ecology] was made with the full knowledge that environmental management of national parks would not become a reality overnight. We are faced with significant shortages of ecological knowledge, technical competence, and workable methodology. Also there are a number of complex social and economic problems which must be resolved before an environmental management plan can be fully effective. Therefore, our start has been at a relatively elementary level. (164)

Despite these advances, policies still fell short of the expectations of The Conservation Foundation. In 1967, the Foundation released a report titled Man and Nature in the National Parks - Reflections on Policy. Emphasis of this report was placed on three areas: development, management of plants and animals, and wilderness in the parks. Issues raised included the need for greater ecological sensitivity in park development, alteration of fisheries policies so that they would mirror those which apply to all other park fauna, the possible futility of
exotic plant control, and whether or not park wilderness zones
were being delineated with future development in mind instead of
maximizing wilderness acreage. (8)

The essence of the report can be summarized in the
following three sentences:

It is our own feeling that the Service has both
resisted the biological and research attitude and at the
same time accepted it cautiously and parsimoniously. If
we deplore the slow pace to full acceptance, we never
theless realize how much else there was to do and how
well it was done. Our thinking is almost entirely in
line with the Leopold and Robbins Committees whose atti­
tude in short is that unless a biologically informed
policy is fully accepted and initiated immediately, the
status of the national park heritage is going to de­
teriorate in all those qualities which inspired its
designation. (8)

In 1972, The Conservation Foundation issued yet another
report titled National Parks for the Future. Release of this
document coincided with the celebration of the National Parks
Centennial. This analysis reinforced the recommendations of the
previous one and called for two major thrusts related to
resources management.

We recommend that the National Park System reassert
its traditional role as conservator of the timeless
natural assets of the United States.

Park designations which de emphasize preservation
(e.g., National Recreation Areas) should be dropped;
recreational use in all parks should be based on natural
assets, not constructed facilities, such as golf courses,
and ecological carrying capacities should be con­
trolling; lands, facilities and/or programs clearly
inconsistent with the preservation function should be
divested or transferred; all areas primarily needed as
scientific study sites should be protected from incompa­
tible public use;... certain damaged landscapes should
be acquired and managed as 'restoration reserves';...
hunting should be generally prohibited; the stocking of
exotic species should stop, and fresh water fishing
activities should be managed to maintain native fish
populations at optimum levels; a well funded program of ecological research should be undertaken for each park unit in order to establish its carrying capacity and to provide an early warning system to identify potential adverse environmental impacts; and these studies should serve as the basis for an annual, system wide environmental report to the nation.

We recommend that the National Park System be used as a showcase of man's proper stewardship of land, water, and air.

Interpretive programs should be redirected to dramatize ecological relationships as they affect man and the entire ecosystem; program personnel should be especially trained for this task, and rangers and management people should be given sabbaticals to permit further study and research in human ecology; park regulations should reinforce the environmental ethic in terms of waste disposal, the use of recreational resources, and care of camping areas; greater emphasis should be given by the National Park Service to educational outreach programs in the public schools; special programs should be undertaken in conjunction with undergraduate scientific programs with cooperating colleges; in park teacher training institutes should be established; and in every feasible respect, the National Park Service should be an outspoken advocate of environmental reform. (9)

Clearly The Conservation Foundation was of the opinion that policy refinement was still needed.

The Political Arena

Although the National Park Service had traditionally been linked to the Nation's political interests, a balance had been maintained between politics and professionalism in park management. Park professionals managed and directed the agency while political influence was utilized by those professionals to get the job done.

Following Richard Nixon's election, Hartzog was asked to step down from the Directorship. Ronald Walker was appointed in
his stead. Walker had worked on Nixon's campaign team and knew nothing about park management or the National Park Service. (179) For the first time, politics became more important than professional preparation.

Summary

Despite the unfortunate manner in which Hartzog's administration ended, the Service had made important improvements in the management of park resources. Funding was up, the number of personnel involved in resource protection had increased to its highest level since the 1930s, many of the recommendations of the Leopold and Robbins Reports were implemented, critical environmental legislation had been authorized, policies were revised and subjected to scrutiny, and the variety of resources within the Park System had broadened. The overall benefit of these advances is somewhat tarnished by the fact that major issues, like mining in the parks, remained unresolved and by a constant barrage of resource problems stemming from increased use, acquisition of new areas with new problems, increased awareness of previously unknown resources problems as a result of new knowledge, research, and development. Organizational confusion also served to hamper progress in resources management. Responsibilities of the management biologists and the research biologists were unclear. Regionalization of the agency's science program, in 1971, weakened the once highly centralized office. Decentralization was, of course, one of the central themes of Hartzog's management system.
Finally, a paper, prepared by Donald Humphrey of the Division of Long Range Planning in 1972, called attention to the need for better interpretation of wildlife resources. Woven into the text of that paper are a number of suggestions about wildlife management itself. Those suggestions indicated that, despite the increase in emphasis on natural resources management, some parks still lacked basic resource inventories and access to professional assistance when dealing with resource problems. (16)
Chapter 9

THE WALKER, EVERHARDT, AND WHALEN YEARS

Director After Director

Between January 1, 1973 and April 24, 1980, the Service had three different Directors. (291) The average length of service for each of these Directors was 29 months. This was a major change from the pattern of long term appointments, which had developed since the creation of the agency. Political whim had taken the upper hand over professional quality in selecting individuals for the Directorship.

Ronald Walker assumed control of the agency on January 1, 1973 and left on January 3, 1975. (291) Ronald Walker had worked as President Nixon's advance travel representative and he had a background as an insurance agent and sales representative. The following commentary by two individuals provides some insight into the ability of Walker to manage the parks. The first is by Horace Albright and the second is by William C. Everhart, who had risen through the interpretive ranks of the agency.

It is impossible not to like the boy, but we simply must return the office to the merit system. (179)

The Walker interregnum was a confused and dispirited time for the Park Service, its policies subjected to political meddling, its director never acquiring more than a superficial understanding of the responsibilities of the job. Employees resorted to gallows humor and adopted a low profile. The Walker experience had one virtue: it was a weighty argument against making another political choice. (179)

On January 13, 1975, Gary Everhardt replaced Ronald
Walker. (291) Everhardt was a career employee, having started with the agency as an engineer. Everhardt provided some degree of stability, but, much of his administration was overshadowed by the agency's Bicentennial activities. Although he used the opportunity presented by the Bicentennial to call for better resource protection, other special initiatives (energy conservation, System expansion and volunteerism) and visitor use became the focus of agency activities. (146) Everhardt resigned from the Directorship on May 30, 1977 and assumed the Superintendency of Blue Ridge Parkway.

William J. Whalen became Director on July 5, 1977. (291) Like Everhardt, Whalen was a park professional, having served in the National Capital Region, in Yosemite National Park and in Golden Gate National Recreation Area. Reflection on Whalen's administration leaves the distinct impression that expansion of the Park System took precedence over other activities. As has been pointed out previously, legislative authorization and acquisition of parks, in and of itself, is a powerful resource protection tool. Undoubtedly, expansion of the System was appropriate in some cases. It's appropriateness may be subject to debate in other cases. Despite the positive aspects of resource protection through land acquisition, the Service had fallen way behind in it's ability to staff those parks and to take positive steps toward resolving resource problems in the new areas.

On April 24, 1980, Whalen was asked to step down by Secretary Andrus. Whalen's removal ended the seven year period during which the Director's office seemed to have a "revolving
door" at its entrance. Unfortunately, the frequent changes in leadership reduced employee morale and undermined organizational stability. Rapid expansion of the Park System and an increasing number of threats to park resources served to worsen a poor situation.

Legislation

During the 1960s, an impressive number of environmental laws were passed. The 1970s also saw a significant number of new pieces of environmental legislation. Most important was the passage of the Endangered Species Act in 1973. Other pieces of earlier legislation were further refined through amendments, such as those of the Clean Air Act of 1977 and through new legislation like the Surface Mining Control and Reclamation Act of 1977. As with the previous decade, many of these laws aided park resource protection efforts.

Redwoods National Park Expansion

The legislative battle over Redwoods National Park continued. The compromise struck during the authorization of Redwoods National Park in 1968, was less than satisfactory from a resource protection point of view.

Born of controversy and compromise, Redwood National Park is the cruelest hoax to occur in over one hundred years of conservation efforts. Although corporate lumber interests could not prevent its creation, they almost caused it to be still born. The park's boundaries were gerrymandered by Congress and the National Park Service under pressure from the timber lobby, and they do not encompass ecologically manageable watershed units. Despite the lessons of Bull Creek, no complete
watersheds with virgin redwood forests were included within the park....

In 1972, a report was completed on damage to the park by logging on adjacent corporate holdings. The Curry Report, completed by the office of the Assistant Secretary for Fish, Wildlife, and Parks, Dr. Richard Curry, documented damage in the Redwood Creek area in particular caused by the interaction of clear cutting mostly upstream from the park and the area's unstable soil types.

"The basic fact is," the report states, "that present harvesting techniques - clearcutting with tractor grading - produce a greater amount of ground surface disturbance and destruction than any other combination of practices heretofore employed or envisioned. Protection of the park is impossible without some controls which extend beyond present boundaries." Documentary proof was finally in, but the report was withheld by the Interior Department until suit by conservationists forced its public release in March 1973. (262)

Finally, in 1978, Congress passed additional legislation which almost doubled the size of the park and which contained language calling for definitive resource protection measures.

In addition, this Act contains the following paragraph:

The first section of the Act of August 18, 1970 (84 Stat. 825), is amended by adding the following: "Congress further reaffirms, declares, and directs that the promotion and regulation of the various areas of the National Park System, as defined in section 2 of this Act, shall be consistent with and founded in the purpose established by the first section of the Act of August 25, 1916, to the common benefit of all the people of the United States. The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress." (92)

The first section of the Act of August 18, 1970, as referred to above, reads as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that Congress declares that the national park
system, which began with establishment of Yellowstone National Park in 1872, has since grown to include superlative natural, historic, and recreation areas in every major region of the United States, its territories and island possessions; that these areas, though distinct in character, are united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage; that, individually and collectively, these areas derive increased national dignity and recognition of their superb environmental quality through their inclusion jointly with each other in one national park system preserved and managed for the benefit and inspiration of all the people of the United States; and that it is the purpose of this Act to include all such areas in the System and to clarify the authorities applicable to the system. (91)

These excerpts are particularly important because they provide clarification of the Organic Act of 1916 and they emphasize the importance of resource protection.

Organization

As with the Hartzog administration, the seven years of the Walker, Everhardt, and Whalen administrations brought numerous reorganizations which directly affected natural resources management. Undoubtedly, some of these reorganizations were instituted as each Director imposed his personal management strategies on the agency. Other reorganizations came as a result of the creation and later dismantling of the Heritage Conservation and Recreation Service. Still other organizational changes developed as legal/political demands made them necessary. (229,243) Some of the organizational shifts came as ripple effects from organizational changes elsewhere in the agency. These changes were principally in the areas of law enforcement, visitor services, and energy and
transportation technology.

To trace the specifics of all of these organizational changes in narrative format would prove confusing. Instead, a chart has been provided which displays the evolution of the various offices (Figure 11). Of far greater importance is a review of the most significant changes.

**The Scientists**

**The Chief Scientist.** Foremost among this group of events was the appointment of Dr. Theodore W. Sudia as Chief Scientist, in 1973. Robert Linn left that position on June 30, 1973, and was immediately assigned to coordinate research conducted at Michigan Technological University. (127) Sudia served in more or less the same capacity until 1981.

Sometime between 1973 and 1976, the Chief Scientist's Office was placed under an Assistant Director for Park Operations and was renamed the Division of Research and Scientific Services.

**NPS Science Center.** Shortly after Sudia was appointed, the agency initiated an abortive attempt at establishing a centralized science center. The following excerpts, drawn from task force reports, provide a synopsis of the birth and abolishment of this center.

On February 16, 1972, Senators Stennis and Ellender wrote to Director Hartzog bringing his attention to a "growing Federal inter agency activity being domiciled at NASA's Mississippi Test Facility/Slidell Computer Complex of which activities of the Department of the Interior, particularly work of the U. S. Geological Survey, are a vital part.'...

On March 3, 1972, Director Hartzog wrote Senator Stennis: "The facility as it now stands, as you know, presents a magnificent opportunity to launch the Service
1971
Associate Director - Professional Services
Office of Natural Science
Associate Director - Operations
Assistant Director - Park Management
Park Operation
Land Acquisition

1973
Chief Scientist
Associate Director - Park System Management
Assistant Director - Resource Management
Natural Resources Division
Land Acquisition Division

Unknown
Associate Director - Management and Operations
Assistant Director - Park Operations
Resource and Environmental Management Div.
Research and Scientific Services
Interpretation and Visitor Services
Ranger Activities and Law Enforcement

1976
Associate Director - Management and Operations
Assistant Director - Park Operations
Natural Resources Management
Research and Scientific Services
Interpretation and Visitor Services
Ranger Activities and Law Enforcement
Assistant Director - Special Services
Land Acquisition

1978
Associate Director - Management and Operations
Assistant Director - Special Services
Land Acquisition
Mining and Minerals Division
Assistant Director - Park Operations
Interpretation and Visitor Services
Ranger Activities and Protection
Associate Director - Science and Technology
Assistant Director - Park Science
Natural Resources Division; Social Sciences Division;
Natural History Division; Research Evaluation Division
Assistant Director - Park Technology
Air and Water Resources Division; Science Information;
Environmental EducationDivision;Appropriate Technology

Figure 11

ORGANIZATIONAL CHANGES
IN
NATURAL RESOURCE MANAGEMENT AND NATURAL SCIENCE OFFICES
1971 - 1979

Source. Management Biology File, National Park Service Archives,
Harpers Ferry, West Virginia.

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into an inter agency, inter disciplinary endeavor which to my knowledge could exist only because of the presence of this installation. We are indeed anxious to take advantage of both the physical facilities of laboratories and computer facilities. In addition to the facilities are the obvious advantages of interacting with other Federal agencies housed at the MTF/Slidell engaged in the work of environmental management, an activity vital to the administration of the Nation's national parks."

On December 15, 1972, the Service entered into an agreement with NASA to establish research and test facilities for systems development at the Mississippi Test Facility...

Original staffing consisted of personnel recruited from National Capital Parks and the Chief Scientist's Office, WASO, to activate the Ecological Services Laboratory. Later staffing included a Chief Scientist and a 3 man Natural Landmark team and a sociologist. Present staffing [1975] is 13 permanent personnel and 21 seasonal (13.7 man years).

There are three main program thrusts: Natural Landmark Studies, Resources Basic Inventory (including a sociologist), and the Ecological Services Laboratory....

Within the first few months of operation, the need for a broader role was recognized by Director Walker, and on December 20, 1973, he appointed a task force to "appraise out present and future plans of organizing and managing NPS/SC to assure its responsiveness to the parks' resources management needs." The resultant report prepared during February of 1974 is frequently referred to as the Kowski report. In summary, the Kowski report proposed:

1. That the Ecological Services Division (former Environmental Services Laboratory) be left at MTF and broadened in charter to include studies of a biological and physical science nature for both natural and urban parks.

2. That the Natural History Theme Studies and Landmarks Division be left at MTF to function as it is now.

3. That the Resources Basic Inventory function
   a. Be authorized as a two year pilot project
   b. Provide a broad scope of resources inventory information rather than just natural resources information.
   c. Be evaluated in two years by a group of representative users to determine adequacy of the Resources Basic Inventory product, and
   d. Be reviewed in two years to determine permanent location.

4. That the concept of a Management Information System providing natural resource information to a variety of users be shelved until after the evaluation
of the two year pilot program for the Resources Basic Inventory.

Somewhere, within the review process, the report slipped from sight and it has never been approved nor implemented... (157)

The first annual report for what became known as the National Park Service Science Center (NPSC or NPS/SC), appeared in May of 1975. Following are excerpts from that report.

... In December 1972, a small contingent of NPS scientists under the leadership of Dr. Clyde Hurst, Chief of the Ecological Services Laboratory, were assigned to MTF to develop a program as provided by legislation.

... On December 14, 1973, Director Ronald H. Walker announced through a Department of Interior news release the establishment of a National Park Service Science Center in the NASA/MTF, and that it would include an Ecological Services Laboratory, and the NPS Ecological and Environmental Management Information Center. Dr. Garrett Smathers, formerly Chief Scientist of the PNR [Pacific Northwest Region] and Unit Leader of the University of Washington CPSU [Cooperative Park Studies Unit], was named Chief Scientist of the new Center....

On February 22, 1974 Chairman Kowski made his report to the Director, which included a discussion paper that clearly established the roles of the Chief Scientist, WASO and the Chief, NPSC. Up to this time, the WASO Chief Scientist, being the project program manager of NPSC, was the responsible and accountable official for projects at NPSC. The basic recommendation of the task force was to transfer this accountability to the Chief, NPSC, but leaving the WASO Chief Scientist as his line supervisor.... (157)

The Center was destined for a very short life, however.

The abolition and phaseout of the National Park Service Science Center (NPSC) was officially announced on June 30, 1976. This was the final action and resulted from a series of events starting immediately after the First Annual Progress Report, May 1, 1975.

In early May, 1975, the Director dispatched a second task force team to NPSC to evaluate its role, function, and organizational placement. On May 23, 1975 the NPS Science Center Sub Task Force Captain made his report to the National Park Service Task Force Chairman. This report became a subject item in a Regional Directors' meeting that followed later. An agreement was reached on the alternative to abolish the Science Center. An
important observation was made by the Task Force that tended to point out that management had made no real commitment to implement the recommendations of the Kowski Task Force [Report] of February 1974. In the final paragraph of the Sub Task Force Report (page 16) the team was critical of the NPSC scientists for their displayed attitudes, and of the organizational problem between the NPS Chief Scientist and the NPSC Chief Scientist. The team's conclusion: 'Our gut reaction has been to abolish the facility.' The justification of these perceptions by the Task Force was the direct result of failure of management to provide NPSC with an approved role, mission and organizational identity. Since February 1974, the NPSC staff has experienced a series of disappointments in trying to implement studies and services without an approved mission. It was impossible 'to do business' in some sections of the Service. These conditions created serious problems in employee morale. Notwithstanding this condition, the NPSC staff was able to meet its 1975 goals. (157)

Execution of the phase out was slow in coming, but, was finally achieved in late 1976 and early 1977. The Natural History Theme Studies and Landmarks Programs and the Resources Basic Inventory Unit were transferred to the Denver Service Center. The Ecological Services Laboratory was dismantled and the research staff was distributed around the agency. At about this time, an Ecological Services Laboratory was re established in the National Capital Region.

A Larger Organization. In 1978, a major reorganization occurred in which the Research and Scientific Services Division was removed from under the park operations arm and given an increased role. Dr. Sudia was appointed as acting Associate Director for Science and Technology. Working for him were Al Greene, as Assistant Director for Park Science and Robert Linn, as Assistant Director for Park Technology. The Natural Landmarks Program, which had resided at the Denver Service Center, was moved, under
Sudia, to a Natural History Division. This new Natural History Division administered the scientific publications program, provided both interagency and international liaison, and worked with the Museum Division on natural history curatorial concerns (139). Other new Divisions included Environmental Education and Air and Water Resources. These additions brought the total number of divisions to eight.

In 1979, Dr. Richard Briceland was appointed to replace Ted Sudia, who had moved on to an assignment with the Bureau of Indian Affairs. Briceland had worked with the Environmental Protection Agency previous to this appointment. (139)

Cooperative Park Studies Units. Cooperative Park Studies Units (CPSU) appear to have been established for the first time in about 1973. These were originally administered by the Regional offices, but, during the life of the NPSC, a significant number of CPSUs were established under the supervision of the Science Center and the Washington Office. When the Science Center was abolished those agreements were transferred to the Regional Offices for administration.

The first association with academia occurred when the Branch of Research and Education was stationed at the University of California, Berkeley and, of course, researchers affiliated with many educational institutions had conducted research within the parks beginning in the 1920s. Formal NPS affiliation with the academic community extends as far back as 1952 when the Jackson Hole Research Station was started (178). By the late 1960s, Dr. Robert Dolan and Dr. Paul J. Godfrey, of the University of
Virginia, were conducting research at Cape Hatteras (246). By the early 1970s, affiliation of colleges and universities with the parks was extensive.

**Natural Resources Management**

The natural resources management function remained stable throughout the majority of this period, although Director Whalen made a significant change by bringing the resource management staff and science staff together under an Associate Director for Science and Technology. The two functions had been organizationally separate for about fifteen years. This reorganization was, in part, a result of the creation of the Heritage Conservation and Recreation Service in January of 1978.

Sometime in the late 1960s or early 1970s, the Division of Resource Management and Visitor Protection was expanded into a Division of Park Operations. In 1973, a Division of Natural Resources Management was established with Neal Cuse as Division Chief. This Division appears to be a descendant from the Division of Park Operations. In 1978, when this Division was moved to have close association with the scientific and research staff, Roland Wauer replaced Neal Cuse as Division Chief (139).

**Other Divisions**

About 1972, a Land Acquisition Division was created with Phil Stewart as Division Chief. This Division also fell under the Park Operations function of the agency. In 1976, land acquisition was removed from operations and placed under an Assistant Director for Special Services. In 1978, a Mining and
Minerals Division was also established under this Assistant Director. (146)

**Programs**

As was the case during the Hartzog era, most of the efforts of the natural resource management and natural science staff, during this period, were focused on resolution of important resource problems. It is also evident that many of the programs the Service started at this time were a direct response to legislation which mandated action. One of those programs was minerals management in the parks.

**Minerals Management**

The reader will recall that the legislation which established Mt. McKinley National Park authorized mining within the boundary of that park. During the Depression, Death Valley and Glacier Bay National Monuments were authorized with legal clauses permitting mining. At the inception of World War II, Organ Pipe Cactus National Monument was authorized with provisions for mineral extraction. Each of these intrusions was logical and perhaps, even valid, within their historical context.

Back in 1933, then National Park Service Director Horace M. Albright, commenting on addition of Death Valley National Monument to the Park System, stated: 'In recommending the establishment of this area as a national monument ... it was not the desire to prevent prospecting and mining within the area, as such activities would in no way interfere with the preservation of the characteristics of the area sought to be preserved. In fact, the picturesque miner is one of the characteristics which give the area the color of the early pioneer days....'

However, gigantic earth destroying machines have
long replaced the picturesque miner and his burro in Death Valley, and they wreak destruction on a scale too massive for legislators in earlier years to have imagined possible... (240)

The reader will recall that a rudimentary minerals management staff was designated in 1971. Between 1971 and 1976 conservation organizations repeatedly called attention to mining activities within the National Park System (287,225,240,250,226,252).

On September 28, 1976 Congress passed the Mining in the Parks Act which closed all park areas to mining except where valid rights existed. It also required that claims within the Park System be recorded with the Secretary of the Interior by September 28, 1977. This did not, of course, suspend mining activities throughout the System, but, it did provide the agency with a much firmer handle on the situation. This Act was further reinforced by the Surface Mining Control and Reclamation Act of 1977 which prohibited the opening of new surface coal mining operations within the System, unless valid mineral rights already existed.

During this same period, two National Preserves (Big Cypress and Big Thicket) were added to the Park System. Conceptually a "preserve" allows for the extraction of energy resources; specifically oil and gas; as well as many traditional activities associated with National Recreation Areas like hunting and off road vehicle use.

Congress responded to the need for U.S. energy sources and growing concerns over the removal of minerals and fossil fuels...
from the parks through legislation. The Service responded by establishing the Division of Mining and Minerals in 1978.

Air and Water Quality

Tied closely to the minerals management issue was that of clean air. Air pollution had been a major concern throughout the country since the late 1960s, but, the 1970s saw increased concern over air quality issues in the National Park System. (276) Attention was almost exclusively focused on the parks in the southwest, where air quality had been excellent and degradation was easily identified. A series of coal fired powerplants was proposed for this region (110, 211, 208). Although the Clean Air Act had been passed as recently as 1970, its provisions were clearly inadequate for the protection of the parks.

Environmentalists breathed a sigh of relief when President Carter signed the Clean Air Act Amendments of 1977 into law on August 8, culminating a three year legislative battle. A key provision giving first class protection to national parks had emerged intact from a marathon seven hour session that House Senate conferees devoted to this provision and to the much publicized auto emissions controversy. (210)

The first widely recognized case of air pollutants affecting park vegetation was flouride poisoning in Glacier National Park, Montana, during the early 1970s. Full correction still has not been achieved. At the same time particulates from coal powered generating plants were observed in the vicinity of Grand Canyon National Park. Research in the national parks along the Appalachian chain reveals that up to 60 percent of the white pine population may succumb to present levels of oxidants.

Careful use of the Clean Air Act Amendments could eventually mitigate many such effects. In this legislation almost 190 areas in national forests, wildlife refuges, and national parks are designated as Class I areas; this designation means that the air quality can not be degraded.... (286)
Interest in water quality and quantity in the national parks did not come into focus until the early 1950s, at Everglades National Park. The park, a 540,000 hectare subtropical system at the tip of Florida, is at the end of a very wide freshwater drainage from Lake Okeechobee. It is a "shock" ecosystem with vegetation succession and fauna cycles heavily dependent upon the water table being high in summer and low in winter. Need for water by the city of Miami and other communities led to an overall loss of water and a reduction in seasonal levels. Partial correction began in 1966 with preparation of one of the Park Service's first Natural Science Research Plans, which aided in "killing" the Miami Jetport proposal in 1971 and the authorization of Big Cypress Preserve in 1975 to protect the park's watershed.... In 1976 the Park Service established its largest research facility, assigned the task of developing a comprehensive ecosystem model for the park.

Hydrologic regulation, with the resultant changes in water quality and seasonal distribution, is the most significant factor now irreversibly affecting the ecological integrity of the riparian zone of the Colorado River in Grand Canyon National Park. An intensive two year ecological survey, begun in 1973, revealed that effects of the upstream Glen Canyon Dam greatly exceed those from present visitor use. Even 15 years after completion of the dam, the system is changing and the end result will be the loss of possibly 13 native and endangered fish species from the park.... (286)

Once again the Service responded to this increased role by establishing an Air and Water Quality Division during the 1978 reorganization. With time, the technology utilized by this Division became increasingly sophisticated and a variety of monitoring and computer modeling programs was initiated.

Overall concern for water resources in the parks prompted issuance of instructions for the preparation of Water Resources Management Plans for all parks containing water resources in 1979 (89).

Pesticide Use

Other programs of this period were not linked as closely
to legislative mandates, but, were spin offs from the environmental awareness of the 1960s. Pesticide use within the System was one of those topics. Preliminary, servicewide pesticide use guidelines were first released in 1970. In 1977, the Service released an environmental assessment on the overall pesticide use program in the agency (106). Although this assessment provided some insight into the extent of pesticide usage throughout the agency, it appears to have been incomplete, with many of the parks not reporting any use. Since the preparation of that document, the Service has moved toward more stringent control and documentation of chemical use. Responsibility for oversight on this activity has rested with the resources management staff since the late 1960s.

Fire Management

Fire management continued as an issue during this period; first with some confusion but, later with more vigor and orderliness.

... while the Forest Service explored the physical equations of fire behavior, the Park Service undertook research almost exclusively on the biology of fire. Not surprisingly, most of the early research came from students of Leopold, nearly all of them wildlife biologists, and like wildlife researchers throughout the century, most were enthusiastic about prescribed fire. Furthermore, they had the example of Harold Biswell, a professor of range management at the University of California and since the early 1950s a strong advocate of prescribed fire. Park Service researchers had at least one example from within their own ranks, too. Between 1951 and 1952 Everglades National Park hired William Robertson as a fire control aid, but with the understanding that he would do research on fire effects. Robertson, a biologist, completed his report in 1953. He recognized that the peculiar biology of the Everglades represented an equilibrium between fire and
water. The problems of drainage and fire damages (and of fire control damages) had to be solved concurrently. . . .

Two studies conducted soon after the Leopold Report focused on fire and the giant sequoia. One, investigating the relationship of fire to sequoia regeneration, was headed by R. J. Hartesveldt of the University of California. The other, a survey of fuel hazards around sequoia groves, was directed by Biswell. Both led to recommendations for prescribed burning, and reports of both were published in the proceedings of the Tall Timbers Conferences, which became a major outlet for Park Service experiments with fire. . . .

All of this ferment was incorporated into the new policy books released by the Park Service in 1968. . . .

In the aftermath of the new policy manual there began a period of experimentation with fire both by research and administration. This laissez faire approach had the advantage of introducing variety and emphasis on local peculiarities, but it had the disadvantage of being fragmented and sometimes ill informed. On the national level, the NPS joined BIFC [Boise Interagency Fire Center] and NWCC [National Wildfire Coordinating Group]. It welcomed the emergence of a strong BLM fire organization, which bolstered the collective hand of the Interior agencies. It saw in interagency cooperation a means to promote park values and park fire philosophy. For the first time since Army days, national interest in wilderness put the Park Service into the vanguard of a national debate about fire policy. Nor was the move toward a more sensitive fire program damaged by the spectacle over the next decade of bulldozers on the mountains of Glacier, of heavy tracked vehicles in the Everglades, and of mechanized line equipment amid the ruins of Mesa Verde and Bandelier all unleashed in the name of fire control.

Slowly, experimentation gave way to a consistent national program. A smoldering natural burn in the Tetons smoked in Jackson Hole, incensed local residents, and obscured the peaks. Always sensitive to public opinion, the Park Service issued a set of interim guide lines to give more specific standards for the conduct of its fire program. . . . (194)

A Branch of Fire Management was established within the Natural Resources Management Division. The Branch was located in Boise, Idaho at the Boise Interagency Fire Center (BIFC). Centralization of Federal land management agency fire management capabilities at BIFC has served to enhance the quality of fire
control and has resulted in standardization of equipment and development of training standards. Finally, in 1979, a Fire Management Guideline was released by the agency (86).

Wildlife Management

Wildlife management issues also continued. Although excessive wildlife populations continued to be a problem, public attention on the problem was generally left behind in the 1960s. Exotic and feral animals were now in the spotlight (286,289,233,218,277). The National Parks and Conservation Association conducted a systemwide survey in 1977 which identified 48 parks with feral and exotic animal problems (239). Most famous in this group were the burros of the Grand Canyon (247). In 1976, The Service released a Burro Management Plan and Environmental Assessment which recommended elimination of the burros by shooting. Public sentiment was against the plan, so the Secretary of the Interior announced, on March 25, 1977, that the plan would not be implemented. During the year and a half following that announcement, further environmental review was conducted. The outcome of this situation would be particularly important because of the precedent it would set for the agency in dealing with future eradication efforts. (247)

Grizzly bears continued to be a concern in the Yellowstone ecosystem. Between 1973 and 1974, the Interagency Grizzly Bear Study Team was created. The Natural Resources Management Division maintained liaison with this team and developed an automatic data processing system for tracking bear information
Although agency sponsored elimination of bears had been suspended, poaching continued to have an impact on the grizzly population.

In 1973, the management of Yellowstone's bison herd came under fire, long after it had reverted to more or less natural conditions.

About 1930 the philosophy of bison management began to change. The buffalo ranching operation in the Lamar Valley was gradually phased out, concurrent with the development of a policy for the administration of natural areas. The last vestiges of buffalo ranching terminated with a token winter feeding of hay at Lamar in 1952. Ranching had never been practiced with bison elsewhere in the park.

In keeping with a range livestock viewpoint, management was to be limited to the regulation of population numbers (reductions) where winter range conditions seemed to indicate a need. Bison numbers in Lamar had been regulated by man as part of the ranching operation, when artificially high numbers were maintained. Regulation of other population segments began in 1955 when the Mary Mountain population numbers greatly increased. (This increase was probably related to the reestablishment of bison on a long vacant but suitable winter range; if so, a comparable increase should not again occur.) Reductions were held at irregular intervals on all population segments between 1955 and 1966....

Brucellosis (Bang's disease, undulant fever) was first tested for and reported in the Yellowstone bison in 1917. Rate of infection has varied considerably among tests made in different years, and also among the wintering populations of a given year. In 1964-65, 129 animals were tested in Lamar showed a rate of 59 percent, 33 tested in Pelican showed a rate of 42 percent, and 302 tested at Nez Perce Creek showed a rate of 28 percent....

As the nationwide program for eradication of brucellosis from cattle has progressed, livestock organizations and brucellosis eradication program personnel of the U. S. Department of Agriculture have focused increasing attention on brucellosis in the Yellowstone bison. During 1972 and 1973 considerable controversy has resulted because the National Park Service of the Department of the Interior has refused to engage in a brucellosis program within Yellowstone National Park. Instead, personnel of Yellowstone National Park have developed an alternative program essentially one of
boundary control - to prevent bison cattle contact. (269)

Science Conferences

Six years had passed since the last gathering of NPS scientists and resource managers. Under the leadership of Robert Linn, a major science conference was convened in New Orleans in November of 1976. The proceedings of this conference were published in two very large volumes. (162) Three years later, a second major conference was convened in San Francisco. This time the meeting produced proceedings that were twelve volumes long, including over 4500 pages of text. This was indicative of the extent of the expansion of the Service's science program and the rapidity with which growth was occurring. (170)

In addition to these nationwide conferences, many of the agency's regional offices began sponsoring resource management and science conferences. These regional conclaves would increase in importance as budget and travel restrictions hampered the ability of the Service to call large meetings.

Miscellaneous Programs

The natural science publication program of the Service was greatly expanded at this time. A Scientific Monograph Series replaced the Fauna Series in 1973. Several other series were started around this same time including Natural Resources Reports, Occasional Papers, Ecological Services Bulletins, Urban Ecology, Transactions, and Proceedings.

Activity of the land acquisition staff was stepped up
considerably during this time with the addition of numerous new units to the Park System. Unfortunately, funding for land protection programs was inconsistent from year to year, resulting in many false starts in park acquisition.

The first use of the terms "State of the Parks" appeared in 1974 when Director Walker issued a review of park management activities. That report indicated that growing concern existed for the impacts of backcountry camping on park resources. By the end of 1974, 23 parks had instituted permit systems to regulate backcountry use. (238)

**Special Designations**

During the early 1970s, the United Nations Educational, Scientific and Cultural Organization (UNESCO) initiated two major international projects which would involve units of the National Park System. In 1970, UNESCO launched the Man and the Biosphere Program (MAB). This program is intended to provide a forum for the study of the biosphere and for study of the effects of man on the biosphere. The program has been divided up into 14 separate projects, one of which is known as MAB 8 - Biosphere Reserves. This project focuses on the designation of an international system of reserves which would serve to safeguard genetic diversity of plants and animals and which would be available for long term ecological and environmental research. Several units on the National Park System have been included in this international system. (14,29) The second program, the World Heritage Program, was established in 1972 with the first selections for sites actually
being made in 1978. This program is different from MAB in that it includes cultural areas and is merely a designation process which does not involve an attempt to maintain biological integrity of the world. Sites selected for their outstanding natural phenomena include Everglades, Grand Canyon, Mammoth Cave, Olympic, Yellowstone, Redwood, and Wrangell St. Elias National Parks. (260)

Finally, under authority of the Marine Protection, Research and Sanctuaries Act of 1972, the Secretary of Commerce could designate National Marine Sanctuaries. The National Park Service became involved with this program with the designation of Channel Islands National Marine Sanctuary in 1980 and the Point Reyes - Farallon Islands National Marine Sanctuary in 1981.

**Environmental Compliance**

Enactment of the National Environmental Policy Act (NEPA), in 1969, resulted in major changes in the planning and development activities of the agency. NEPA mandated environmental assessments and other recently approved environmental laws necessitated compliance. Because this was becoming a highly specialized field, the Service established an environmental compliance office in Washington and augmented the planning staff of the Denver Service Center with individuals with similar duties (146). With time, compliance officers were also located in Regional offices.
State of the Parks

Just as the late 1960s were a period of concern over the condition of our environment throughout the world, so were the late 1970s in relation to the condition of the National Park System.

In the March and April issues of National Parks and Conservation Magazine, the National Parks and Conservation Association (NPCA) reported on information they had obtained in a 1978 survey of 203 parks, under the title "NPCA Adjacent Land Survey: No Park is an Island." These articles revealed a multitude of both internal and external threats affecting park resources. In summary, the authors stated that, "Unless all levels of government mount a concerted effort to deal with adjacent land problems in a coordinated manner, the National Park Service mandate ... will be completely undermined.'

At the same time, in December 1979, The Conservation Foundation published an 'Issue Report' entitled, "Federal Resource Lands and Their Neighbors" (Shands, 1979). This document summarized responses of questionnaires that they had sent to a variety of Federal land managers. It stated that adjacent land development was the principal threat to national parks and other protected lands.

These combined efforts in developing these reports did not go unnoticed by the Park Service and members of Congress. In fact, in July 1979, the Director of the National Park Service received a letter from Congressman Phillip Burton and Keith C. Sebelius that asked the Service to prepare a 'State of the Parks Report.' The request stated, "What we have in mind is in the line of factors such as increasing air and water pollution, encroaching developments, troublesome visitor use pressures, legally on going or rights to exercise incompatible use within the parks, and the like.'

Since I was the Washington Office Chief of Natural Resources at the time, I assumed the responsibility for developing the Park Service response. Questionnaires were sent to all 333 park units. We asked, "In light of the enabling Legislation, the Legislative History, and the Statement for Management, What Threats are Impacting the Park Resources and to What Extent?' And members of my staff began to research materials that could be utilized in writing the report. (292)

In May 1980, shortly after Director Whalen left his position, an
An impressive State of the Parks Report was submitted to Congress. This report would be of major significance in outlining the direction of the servicewide natural resources management program for several years to come.

**Policies**

As discussed previously, legislative refinement continued throughout this period. Just as legislation was refined, so were servicewide policies related to the management of park resources. The first major revision came in 1974, in a statement by Ronald Walker before a Subcommittee of the House Committee on Appropriations:

Director Connie Wirth, in the early 1950s when the park [Cape Hatteras National Seashore] was acquired, wrote a letter guaranteeing those residents in and about the park area that the Park Service would do everything in its power to stabilize [the sand dunes] and continue the beach nourishment program to allow them in perpetuity to be there. Twenty years ago, I might well have done the same thing Connie did, based on the information and the technical advice he had at the time and considering the cost factors at the time... My personal opinion is it's the wrong thing to be doing, to pump sand and try to stabilize that area... While we feel an obligation, I do personally, it's the wrong thing to be doing. (246)

At least on paper, nature was to take its course at Cape Hatteras. Robert Behn indicates that, although Walker's statement was never incorporated into the agency's official policies, management of the shoreline at the Cape reinforced Walker's statement (246). In this case, management actually meant no management. In 1973, Robert Dolan and Paul Godfrey had produced a short publication which explained shoreline processes and which
set the tone for management strategies from that point to the present (80).

In 1975 this policy was put into action when Congress deleted by amendment the roads and 250 hectares of intensive development called for in the 1965 enabling legislation for Assateague Island National Seashore. Subsequently this policy was the main factor behind the decision for no additional permanent development on Cape Lookout National Seashore. (286)

The second major policy change occurred under the leadership of Cary Everhardt in 1975. At this time, the three volume set of policies, prepared under the Hartzog administration, were consolidated into a single volume. No distinction was made by the policies between natural, historical or recreational areas. Instead, the newly revised policies were organized according to the principal functions within park management. The policy revision, which began in 1975, extended until 1978, when the document was finally released. The "Management Policies" were initially supplemented with a variety of Directives. These were followed by a series of Guidelines which provided detailed instructions on various aspects of operations and which occasionnally clarified policies. Early Guidelines addressed topics such as park planning, environmental impact statements, and pest control (107,105,84,106).

The scope of the revised natural resources policies broadened somewhat to include fire management, solid waste and noise pollution abatement, weather modification, cave management, and pesticide use. Sections addressing other topics were merely expanded. In addition, many of the policies were cross referenced to recent legislation and Executive Orders.
Despite the evolution of these policies, certain issues still remained unresolved. Most notably, the fisheries policy, which allowed fishing to continue. This policy had been questioned on several occasions, but, was never modified to a point where complete protection was afforded to fishery resources.

Although attitudes changed during the 1970s, fishing is still a sanctioned park use. The most recent challenge to NPS policies came in 1979 when a report from a task force established by the Assistant Secretary of the Interior for Fish, Wildlife, and Parks, was released. That report made 22 unique recommendations. One of those dealt with the adoption of a new Service-wide Aquatic Resources Policy which called for:

a) management of fisheries in a manner which allows natural functions
b) management of fisheries in a manner which allows nonconsumptive use
c) after consideration of a and b, consumptive use may be allowed
d) reduction of exotic species

While allowing consumptive use of fishery resources, in keeping with specific legislative mandates, the prevalent concept throughout the report was that of preservation and restoration of native aquatic ecosystems. (192)

Interestingly, this issue has never been raised as a major one by the conservation organizations. In fact, the National Park and Conservation Association, well known for its stand for resource protection, appears to waiver on the issue. In June of 1980, a short, rather obscure article was printed in the Association's magazine which supported the recommendations of the Assistant Secretary's Task Force (228). One month later, the next issue of the same magazine included a rather prominent article encouraging sport fishing at Cape Hatteras (249). Wrapped into this issue is a differentiation made between freshwater and saltwater aquatic resources. When this policy was questioned in the 1930s
and 1960s, emphasis was placed on the protection of freshwater organisms.

**Growing Pains**

Expansion of the Park System during this period was awesome. Numerous sites of small acreages were added individually. Important individual additions included Congaree Swamp National Monument and Canaveral National Seashore. Groups of smaller sites were added under two pieces of general legislation; the National Parks and Recreation Act of 1978 and the Omnibus Bill of 1980. Most of these new areas were historic sites but two of them included significant swampland (Jean Lafitte National Historical Park and Pinelands National Preserve).

All of these, however, were overshadowed by the passage of the Alaska National Interest Lands Conservation Act of December 2, 1980. This one act added 43.6 million acres of parkland to the System. Ten new units were added and three existing units were expanded. Without question, the diversity of park resources became more complete, but much more complicated to manage. Despite the tremendous opportunity these units provided, special resources management concerns would surface. (257)

This legislation allows subsistence hunting in most of the new units and sport hunting was permitted in all "Preserve" lands. This would necessitate close monitoring of wildlife populations to assure continuation of resource integrity. The legislation also gave the State of Alaska authority to regulate
all subsistence resource use (283). Finally, this bill established 32.3 million acres of wilderness. Wilderness areas in the newly established units were to be managed as all other wilderness areas except that traditional (motorized) access could continue. Limited backcountry facilities were also authorized. The challenges associated with the resources of these parks were to be unlike any the Service had faced previously. (257)

Transition Needed

By the end of 1979, the National Park Service was in desperate need of stability. Leadership of the agency had long since passed from the era of strong, professional directors. The size of the System had more than doubled. Resource problems were becoming increasingly complex and involved activities external to the parks. Environmental legislation had become increasingly important in the management of park resources.

Although the Service did make significant improvements in the management of resources during this era, the load was far too great for agency personnel to deal with effectively. In short, a change was needed.
Chapter 10
THE DICKENSON YEARS
A Steady Hand

Russell Dickenson assumed the Directorship on May 1, 1980. The Service had just completed a decade of turmoil and rapid expansion. Morale among employees was low. Russell Dickenson was a professional Service employee, who started his career at the Grand Canyon. (230)

In a recent interview, Dickenson expressed determination to restore confidence and pride. If anyone is capable of lifting the agency's head, Dickenson is the man. He understands the system from the bottom up. Having started as a ranger and risen through the ranks, five years ago he was Deputy Director and ready for the top job. He was passed over, however, being too qualified for Interior Department politicians, and took a field assignment in the Northwest. This time around, in order to save the Park Service and the parks, Andrus had no other choice....

The challenge facing Dickenson is to rekindle the old loyalty, esprit de corps, the mystique that once made the National Park Service unique in federal service. He is a little like the new general of a disheveled army that has been reduced to firing blanks instead of bullets. Many of the troops in the ranks are frightened and frustrated. Mostly they keep a low profile; able people with much to say speak only with trepidation and caution, or they take early retirement.

Dickenson's appointment immediately stimulated morale, but the troops have no way of knowing how long Dickenson can last, and neither has he.... (7)

Tension arose not long after Dickenson went to Washington with the election of Ronald Reagan over President Carter. Certainly the new administration would name a new Secretary of the Interior, but, would a new Park Service Director be named as well? James Watt was named as the new Secretary of the Interior. Fortunately, he had worked with Mr. Dickenson when Mr. Dickenson

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was the National Capital Region's Director. Mr. Dickenson was asked to stay on as Director thus dissipating some of the concern that agency employees and national park enthusiasts had developed over the fact that the position would once again become a political plum. During the succeeding five years, Mr. Dickenson proved himself to be one of the staunchest supporters of natural resource preservation the Service has ever had.

 Asked for his views on appropriate public use of the parks, Dickenson cited a classic statement made by an earlier director, Conrad L. Wirth, who served for twelve years until 1964.

 "To one person climbing the Teton peaks is an inspiring experience, while to another driving along the Snake River and looking at the mountains has the same appeal. My basic philosophy has been that parks are for people for people to use and enjoy, but not with the right to destroy. The biggest problem has been, and will continue to be, convincing the public of the need for sound management, protection and preservation.'...

 "But I believe in complete openness before the public. If we fail to make Americans aware of problems facing the national parks, and to involve them in choosing the right solutions to these problems, then we are failing in our responsibility as stewards of these public resources.' (7) 

 Development and Deregulation

 Running parallel to Mr. Dickenson's advocacy of resource preservation were a series of events which resembled the Mission 66 era. One of those events was the initiation of the Park Restoration and Improvement Program (PRIP); a multi year, high profile program aimed at upgrading park facilities which had suffered years of neglect. Close on the heals of PRIP came the "Roads Bill". Although this bill was not sponsored by the National Park Service, it provided funds for highway improvements
throughout the country, including parks, through gasoline taxes. This overall situation is most interesting, because the Service was encouraging sound resource protection on the one hand and instituting developmental or visitor use programs on the other. Once again the dilemma of use and preservation resulted in conflicting operational activities. Fortunately, almost all of the development was aimed at rehabilitation of existing facilities and not at construction of new facilities.

Also worthy of mention is the fact that the Reagan administration de-emphasized environmental quality and regulation in a general sense. The impact of this de-emphasis, as it relates to park management, has yet to be fully realized.

Organization

More Reorganizations

During Dickenson's administration, two major organizational changes took place which had sweeping impacts on the management of park resources. Prior to 1981, the relationship between the resource managers and the scientists had been awkward. It appeared logical to have the resource managers and scientists closely associated with one another, but, the organization did not work. Scientific emphasis was placed on a variety of highly technical issues including air quality thus stifling many of the traditional resources management activities. In June of 1981, the former Heritage Conservation and Recreation Service (HCRS) was absorbed by the National Park Service, thus
returning the historic preservation and recreation planning extension function to its original location. (271) With this move, came a realignment of NPS offices. The Division of Natural Resources Management under the leadership of Roland Wauer was relocated within the domain of an Associate Director for Management and Operations and an Assistant Director for Park Use and Operations. (139) A new position of an Assistant Director for Park Facilities Support was also placed under the Associate Director for Management and Operations. This second Assistant Director supervised the Land Resources Division.

1981 also saw the continuation of an Associate Director's position in charge of Science and Technology, but, the total number of offices reporting to that individual decreased. The new organization included an office of air quality, of natural science, of water resources, of energy, conservation and technology, of special science projects and a staff handling the Natural Landmarks Program.

The 1981 reorganization sparked positive action on the part of the Natural Resources Management Division. During the two years between 1981 and 1983, the Natural Resources Management Division became extremely active and real progress was made in improving the agency's resources management program.

In 1983, an initiative was undertaken to streamline the central and regional offices (242, 214). That effort resulted in yet another reorganization of the Washington office. This reorganization brought science and management back together under an Associate Director for Natural Resources. Two overriding
themes that pervaded this reorganization were the centralization of staff involved in highly technical and politically sensitive issues (air and water quality, and mining) and decentralization of biological and sociological programs. Many of the esoteric endeavors of the agency's scientists were suspended, thus, perhaps making the blend of resource managers and researchers more palatable. This new office included Divisions of Biological Resources, Special Science Projects, Air and Water Quality, and Energy, Mining and Minerals. The Air and Water Quality Division had field units in Denver and Ft. Collins, Colorado. The Energy, Mining, and Minerals Division had a field unit in Denver, Colorado. This reorganization pooled the resources of a number of different groups which had evolved with minerals management and hydrological responsibilities. Throughout the 1970s, individual parks and regional offices added specialists in these fields to their staffs. This reorganization brought their skills together to better serve the entire Park System. Almost all functions of the Natural Resources Management Office were absorbed by the Biological Resources Division. The Branch of Fire Management remained within Management and Operations as a unit of the Division of Ranger Activities.

In late 1984, the Office of Natural Resources grew with the transfer of the Geographic Information Systems Unit from the Denver Service Center. This Unit was the direct descendant of the Resources Basic Inventory Branch which developed originally within the NPS Science Center.

To complete the evolution of groups involved in resource
related issues, it should be noted that the Land Resources
Division was placed under a new Associate Director for Planning
and Development.

Centralization vs. Decentralization

As indicated in the discussion on the Hartzog administra-
tion, the vast majority of the resources management work was
handled by individual park staff members. This was, of course,
in contrast to the 1930s when the Washington office was in direct
control of most routine resource projects. This trend of de-
centralization became increasingly more apparent during Walker's,
Everhardt's, Whalen's and to a limited extent Dickenson's admini-
stration. This was not, however, universally the case.

An examination of some of the events which can be
considered true high water marks in natural resources management,
must be completed to understand where the Service stood on the
centralization versus decentralization issue. Roland Wauer has
provided an excellent summary of those events:

to the Congress,' was sent to Congress by the Director
(N.P.S., 1980). It represented the first time the Ser-
vice had undertaken a complete evaluation of the condi-
tions of its natural and cultural resources. The report
stated that none of the parks was immune to the vast
array of threats that were bombarding the resources from
every conceivable direction. The report documented the
magnitude of the threats from within and outside of the
parks, and stated that the large natural areas,
America's crown jewels, were most seriously threatened.
The report focused attention on the resources as never
before, and reminded the Service of its primary mandate
to protect the significant resources within its area of
responsibility. It provided the very best 'hook' avail-
able for the Park Service to obtain the support neces-
sary to initiate the kind of sound natural resources
management program essential to addressing the ever increasing spiral of threats.

As a follow up to the May 1980 report, the Service was requested by Congressmen Burton and Sebelius to prepare a second report that would outline a strategy for preventing and mitigating the myriad of internal and external threats that were identified in the first report.

This second report - "State of the Parks: A Report to the Congress on a Service wide Strategy for Prevention and Mitigation of Natural and Cultural Resources Management Problems (N.P.S., 1981) - was sent to Congress in January 1981. It identified numerous prevention and mitigation activities underway and anticipated within the parks, and also listed generic programs from new guidelines to an expanded in Service training program planned for the Service. One of these was the development of a Servicewide Natural Resources Management Trainee Program....

During 1979, a good deal of information on NPS personnel was accumulated in preparation of the 1980 State of the Parks Report; most was not utilized. That personnel database, however, provides an excellent point of reference on the status of various types of employees on duty with the Service on December 1979.

One hundred and fifty four individuals were identified as natural resource specialists within the 333 park units. The 154 natural resource specialists were stationed within 62 of the park units; 271 units (81%) were without a natural resource specialist. The total of 154 is skewed, however, because 51 of these were stationed at only two areas, Everglades and Redwoods national parks; both parks were recipients of significant natural resource programs through special appropriations. It is obvious that a considerable shortage in natural resources management expertise existed within the Park Service in December 1979.

Three years later, in fall 1982, a second survey of all the parks was undertaken ... to assess the current natural resources management capability of the Service....

The new database revealed a considerable increase in natural resources management expertise in the field during the three years. Ninety three additional employees had been added to the natural resources management roles. A total of 247 park employees were identified within 112 park units, increases of 36% and 45%, respectively. Thirty four percent of all park units now possess at least one specialist on their staff, compared with only 19% in 1979....

Resources Management Plans (RMP) are one part of the Service's General Management Planning Process, but usually are prepared independently by the park staff. The
RMP's document all of the park's management, monitoring and research activities relating to the area's natural and cultural resources. These plans describe all of a park's resource problems and discuss a full range of resource related activities underway and anticipated. RMP's are the park's single most important document for the management of its natural and cultural resources.

Although RMP's have been a required part of a park's planning process since the 1960's, few parks complied. In fall 1979, only 94 park units possessed an approved plan. By winter 1982, a total of 222 (an increase of 128 plans) park units possessed an approved plan, and an additional 16 were in final draft stage. (292)

Thus, one can identify the following highlights in the agency's resources management program between 1980 and 1982:

1) Issuance of two "State of the Parks' reports which turned the Service's attention back to resource protection. (112)

2) Increased training for natural resource managers. (113)

3) Renewed emphasis on preparation of Resources Management Plans. The reader will recall that RMP's were first advocated in the mid 1960s. The format of the current plans is virtually identical to those prepared in the 1960s.

4) Preparation of the first "State of the Parks' report stimulated the development of a "threats" reporting system which was used to update the original report. (113)

5) A special funding program known as Significant Resources Problems (SRP) was established to address the most pressing resources management issues.

6) A Resource Information Tracking System was proposed and preliminary work was started on the project.

Let us now return to the centralization vs. decentralization issue. Prior to 1983, a number of conditions existed which
encouraged involvement of the Washington office in park operations:

1) The Natural Resources Management Division was responsible to an Assistant Director for Park Use and Operations. This may have given a psychological edge to the need for operational centralization.

2) The Service had identified major resource problems through the "State of the Parks Reports." The solutions to many of those problems could only be implemented by the Washington office. Thus, we see the development of a servicewide training program, as mentioned by Ro Wauer and a special funding activity known as Significant Resource Problem (SRP) funds.

3) The staff in the Washington office also recognized that the Service had been negligent in the preparation of Resources Management Plans. As a general rule, all planning in the Service is done on a park or regional office level. But, as Ro Wauer mentioned, the vast majority of park units did not have RMPs in 1979. Thus, the Washington office played an aggressive role in pushing for RMP preparation and in reviewing their adequacy.

Following the 1983 reorganization, a number of changes were made which turned the trend toward decentralization:

1) The Service's science and natural resources management programs were brought together, with the science staff enveloping the much smaller resources management staff. This reorganization also brought about a change in leadership,
with Ro Wauer leaving Washington, and Dr. Richard Briceland assuming the new Associate Directorship.

2) This change in leadership resulted in the philosophical change that the Washington office should no longer be involved with Resources Management Plans. At about the same time, the SRP funding source faded away and a new consolidated natural resource funding program was initiated.

3) With time, the "threats" reporting system was decentralized to the regional level.

4) The 1983 reorganization came at a time when tight Federal budgets were forcing reductions in personnel, particularly in central offices. When the new Division of Biological Resources was created (a combination of the Natural Science Division and the Natural Resources Management Division), the staff was deliberately reduced in size with the transfer of employees to the field. The thought being that the Service had plenty of biologists and a strong central program was unnecessary.

5) This theme of reducing the size of the Washington Office of Natural Resources continued in air and water quality, minerals management, and special studies. Only a small core of individuals make up these Divisions within the Washington office presently.

Despite the apparent trend toward decentralization, certain natural resource programs have, in actuality, become more centralized. The second servicewide Natural Resource Management Trainee Program, started in the fall of 1984, was placed under
much greater central office control than the first program. In addition, the high technology programs of the Air Quality, Water Quality, Minerals Management, and Geographic Information Systems Divisions have all been reorganized as "field units" located in Denver and Ft. Collins, Colorado. From a practical perspective, these field units are central office staff with direct involvement in some aspects of park operations.

Another program which was maintained in a centralized status was the agency's Pesticide Use Program. In 1982, the servicewide Pesticide Use Policy was strengthened and a more accurate reporting system was instituted (151). Integrated pest management (IPM) became the norm, at least in theory, if not entirely in practice. Strict control was maintained over this program in an effort to reduce the overall amount of chemicals applied on parkland.

Growth of the IPM program has been quite interesting. At its inception, heavy emphasis was placed on integrated pest management strategies for controlling insect pests. In a very short time, this concept was broadened to applications in plant pathology, animal damage control, and curatorial management as well as insect control in agricultural settings, historic and modern structures, forests and landscaped areas.

Legislation and Regulations

Only a minor amount of legislative activity, pertinent to natural resources management policies and programs, occurred during Dickenson's administration. In keeping with President
Reagan's philosophies about land management, authorization of new areas slowed to a snail's pace. No new pieces of environmental legislation were enacted and only one act was amended. On November 16, 1981, President Reagan signed into law a number of amendments to the Lacey Act which strengthened the law considerably. Penalties were increased, protection was extended to rare plants, American Indian tribal law was established as one of the underlying laws of the Act, and it authorized the payment of rewards in the course of successful investigations. Significant potential exists for application of these amendments to wildlife violations within units of the Park System.

Wilderness legislation was perhaps the highlight of this aspect of natural resources management. In 1984 and 1985, the Congress made major strides in authorizing wilderness bills, many of which affect NPS units.

The recent resolution by Congress of a five year controversy over wilderness has set loose a flood of state wilderness bills in the House and Senate. If these bills are passed, the present administration could sign into law more wilderness than any other in recent history.

The sticking point in the wilderness controversy had been the amount of time allowed before an area could be reconsidered for wilderness designation. Almost immediately after the agreement was reached, a flurry of bills was reported by the Senate Energy and Natural Resources Committee. A number of other state wilderness bills including Alabama, Florida, Pennsylvania, Texas, Tennessee, and Utah are awaiting committee action at this writing.

Almost half the states, from Virginia to California, have wilderness bills currently pending in Congress.... (212)

Early in Dickenson's administration, wilderness legislation was authorized for Fire Island National Seashore.
The waning days of the 96th Congress saw the passage of P.L. 96 585 establishing the Otis Pike Fire Island High Dune Wilderness. The 1,347 acre area, located only sixty miles from Times Square, becomes the first wilderness area in an eastern national seashore... (215)

One further legislative highlight of this period was the initiative for passage of "park protection" bills. Stemming from the 1980 "State of the Parks Report," this legislation was aimed at resolving adjacent land use problems through interagency cooperation and coordination. The proposals also call for biannual "State of the Parks Reports" and place emphasis on management of parks as "biological control areas" (231,245). Final action on this legislation is pending.

During much of Dickenson's administration, an effort to revise the special regulations which apply to the Park System was underway. The regulations needed revision to bring them in line with current policy, to provide uniformity throughout the Service and to address new issues confronted by park managers. If regulation enforcement is considered a tool to be used to protect park resources, rather than an end in and of itself, revision of park regulations takes on new meaning. The first major revision was completed in 1984. This revision was not completed without problems however. The major obstacle centered around trapping and hunting.

Hunting is specifically authorized by law in forty five units of the National Park System, primarily national recreation areas, seashores, and the like. Trapping is legally permitted in twenty of these areas. In the remaining twenty five parks, fourteen clearly prohibit trapping, while trapping does occur in the other eleven areas. What is the basis for this inconsistency? The NPS realized the scope of this problem, in 1980, when it discovered that unauthorized trapping occurred

The catalyst for the discovery of these trapping inconsistencies was a comprehensive review of the NPS's general regulations. These servicewide rules, which the NPS uses to manage all 334 units of the National Park System, were last revised in the mid 1960s. In intervening years the NPS increasingly became aware of the inadequacies of these regulations. As new kinds of areas—national seashores, national recreation areas, and the like—became part of the System, new laws were enacted and visitation increased significantly.

The existing regulations were vague, confusing, and inconsistently enforced. One such regulation governed hunting and trapping. In eleven areas, park managers broadly interpreted the authority for hunting to encompass trapping. The language of the law, however, said nothing about trapping in these areas.

In an attempt to resolve the confusion over hunting and trapping, the NPS published a proposed rule in the Federal Register on March 17, 1982. This regulation stated that hunting and trapping would be permitted in park areas only where specifically authorized by federal statutory law; that is, where Congress had inserted the words 'hunting and trapping' in the legislation establishing the particular park area. Because Congress authorized hunting in forty five parks, and trapping in just twenty of these areas, apparently it intended these two activities to be distinct.

In the absence of specific rules, the NPS did not believe that it had the administrative discretion to authorize the killing of wildlife, nor the option to broadly interpret hunting to include trapping.

... The final rule, published in the Federal Register on June 30, 1983, outlawed trapping in areas where Congress had not specifically authorized trapping. The NPS supported what it believed to be its obligation to the nation despite strong lobbying from organizations such as the National Trappers Association and the National Rifle Association, and opposition within the Department of the Interior, particularly on the part of Assistant Secretary C. Ray Arnett.

As a result of the overwhelming public support for this new regulation, and a concern over the backlash if he opposed the regulation, Mr. Arnett signed the final
rule. Its effective date, however, has been delayed twice once until December 19, 1983, and again until March 2, 1984. One reason for this long delay was to provide a mechanism to allow the continuation of trapping in these eleven areas through January 15, 1985. This mechanism took the form of special regulations published in the Federal Register on December 27, 1983.

The rationale Interior gives for delaying trapping regulations and issuing special regulations in their stead is that trappers would have to relocate their operations. The delay also gives Congress time to amend the enabling legislation in these park areas.

In arriving at this position, the Interior Department has ignored the fact that if it does not have explicit authority to allow trapping in the first place, then the Department should not allow its continuation, for however short a period. (272)

On January 15, 1985, implementation of the regulations banning trapping was extended, once again, until January 15, 1987 (209).

In 1984, the National Rifle Association filed a suit against the Department of the Interior challenging the NPS regulations against hunting and fishing. The National Rifle Association argued that since Congress had not specifically prohibited these activities in park enabling legislation, they should be permitted. Several conservation organizations have intervened in the case on behalf of the National Park Service. (227) In the spring of 1986, the United States District Court ruled in favour of the National Park Service.

One further extension of the trapping issue was hunting in the Alaskan parks. Members of Congress introduced legislation to allow sport hunting in the Alaskan parks (207), as well as trapping in the eleven parks where it has occurred without authorization (227). No final action has been taken on any of these proposals.
The fact that these regulations were approved at all is interesting since the Reagan administration was consistently de-regulating activities which impact the environment. Regulations governing mining in national recreation areas were suspended, as were regulations controlling oil and natural gas exploration in National Marine Sanctuaries. Special regulations at Glacier Bay National Monument, aimed at protecting humpback whales, were also suspended for a period. Revised grazing regulations, administered by the Bureau of Land Management, posed serious problems on NPS lands where grazing is permitted (219).

Two other major revisions of the general regulations are currently underway.

Major Issues

It is difficult to say specifically what issues or programs were of the greatest importance during the Dickenson administration. The Service was quite literally overwhelmed with problems. The organization was, however, beginning to get a grip on the extent of the problems with the publication of the "State of the Parks" report.

Issues and activities which came to the forefront during the Dickenson administration included restoration of bighorn sheep (266) and wolves (268,278), control of feral goats (15,2) and European wild boar (233,218), concern over the status of the Florida panther (217,263), and mosquito spraying at Fire Island National Seashore (216,222). Other challenges centered around visitor use of the parks. Snowmobiling was reopened
as an issue (253,236,235,237); off road vehicle use at seashore areas was addressed (232,213,234,220,275); use of mountain bikes on park trails threatened park resources (270); and nude bathing was linked to resource degradation (293,224). The presence of Ciardia in park waters posed problems for visitors (273). Finally, an array of activities outside of the parks presented threats to the health and integrity of park resources.

Geothermal development was proposed for a number of areas (279,274,264); tar sands mining in southern Utah would be potentially damaging to an extensive number of parks (254) and integral vistas, views between points inside parks and other points outside of parks, became a concern (221).

Wildlife Management

Wildlife problems continued as they had for decades. In 1981, a Special Task Force of the National Park System Advisory Board, headed by Durward Allen, submitted a report to Secretary Watt, on animal problems in the parks. That report called attention to wild boar damage in Great Smoky Mountains National Park, grizzly bear management in the greater Yellowstone area, feral burro management in Death Valley, Bandelier, Channel Islands, and Grand Canyon and restoration of the gray wolf in Yellowstone. The report also recommended that Council on Environmental Quality regulations related to the National Environmental Protection Act not interfere with critical wildlife management problems. In addition, it called attention to the extent of the exotic species problems, the issue
of urban wildlife management, the issues of fishery management, and wildlife overpopulations. (37)

Removal of burros from parks, particularly the Grand Canyon and Bandelier, was slowed considerably by the efforts of the Fund for Animals to round the animals up and remove them alive (223). By 1985, the issue evaporated as the majority of the feral burros were either removed alive or shot. Concern about range expansion still exists in a number of park units because free roaming horses and burros are protected on adjacent Forest Service and Bureau of Land Management lands.

Of all the wildlife issues, the status and protection of the grizzly bear was the most publicized.

... In 1969 and 1970, as part of a new management trend toward restoring natural balances, major dumps in the park were finally closed. Now almost fifteen years later, feeding the bears is being promoted as a solution to an alarming drop in Yellowstone's grizzly population. The proposal is controversial, and for good reason.

It was those same dumps and their clusters of grizzlies that provided two distinguished scientists, John and Frank Craighead, an opportunity to launch their ambitious long term study of the bears in 1959. The study finally ended, in bitterness and controversy, in 1971, just after the dumps were closed.

The Craigheads maintained that the dumps had not only bolstered the nutrition of the bears but kept them concentrated and safe within park boundaries during the summer. When the dumps were closed, scores of grizzlies were killed both in the park and outside. Many were destroyed by various agencies and many more died accidentally or as victims of poachers.

Both state and park policies toward the grizzly changed dramatically at this time. Any bear sighted in an area where it could come into contact with people was actively dealt with in some way. Yellowstone rangers killed a number of grizzlies that were so used to feeding at dumps that they repeatedly raided campsites rather than forage on their own. State agencies killed a number of the bears that had ranged outside of the park looking for new sources of food....
Through the 1970s the National Park Service continued to believe that the population would recover from the short term losses once the bears were redistributed naturally, but the past two or three years the NPS has begun to express its own concern about the decline of the population....

Concerned about the change in reproductive rates, Frank Craighead has strongly recommended supplemental feeding for years, in the form of some dump type feeding arrangements. In the past year, for reasons that are less clearly documented, independent groups as diverse as the Wyoming Outfitters Association and the Murie Chapter of the National Audubon Society (Casper, Wyoming) have supported supplemental feeding, as have Wyoming Senator Alan Simpson and Assistant Secretary of the Interior C. Ray Arnett. Public attention has further been focused on the issue by articles in popular magazines such as Atlantic (February 1983); Natural History (January 1984); and Western Outdoors (October 1983).

In early 1983 a task force appointed by the Inter-agency Grizzly Bear Committee, the umbrella group that oversees and makes recommendations on grizzly management, met to consider the possibilities and consequences of initiating some kind of supplemental feeding program. The task force was perhaps unique in the history of the bear controversy, for its members included not only representatives of the various agencies involved, but John Craighead, one of their most outspoken critics. This made for a rare and promising combination of opposing perspectives. The task force met several times and submitted its final report on December 5, 1983.

In its final report, the task force recommended against supplemental feeding pointing out that if human caused mortalities of grizzlies can be kept low enough, the bears can maintain their numbers in the Yellowstone area as they did for thousands of years before the dumps were established. Though not ruling out the possibility of supplemental feeding in the future, the task force saw serious problems with any attempt to feed the bears systematically. They asserted that supplemental feeding is 'not a cure all and should not become a substitute for proper management of habitat and human activities inside and outside Yellowstone.' The message was that if we give the bear the chance and adequate protection the bear will feed itself....

The task force criticized the most commonly suggested system for supplemental feeding, that of killing park elk. In order to do this, park service elk biologist Douglas Houston estimates, at least 1,100 to 1,300 elk would have to be shot each year. Even this number might not be sufficient for the feeding program to work. To produce such a harvest each year, Houston
says, would require massive manipulation of the elk population, including reduction of the herd to half its current size.

On February 14, 1984, the Interagency Grizzly Bear Committee met in Denver to review the report of the task force. They approved and accepted it. They also directed bear managers to investigate ways to use feeding as a management tool. For example, if a known sheep killing bear is tracked heading toward sheep range outside the park, managers may drop a carcass or other food in its path, diverting it long enough to get the sheep moved. (334)

**Forest Insects and Disease**

The Service joined hands with other federal and state agencies in efforts to monitor and, in some cases, control insect and disease pests. High on the list of emphasis were the Gypsy Moth and the Southern Pine Beetle.

**Fisheries**

In 1980, the Service issued special regulations for Everglades National Park with the intention of phasing out commercial fishing by 1985 (161). In 1981, Secretary Watt reopened this issue to public comment. Watt hoped to be able to reopen the park to commercial fishing (206).

**Vegetation Management**

One of the many natural resource management fields is that of vegetation management. In its broadest sense, the field includes exotic plant control, native plant protection and restoration, hazardous tree and plant control, landscaped area maintenance and vista clearing. It is also linked to fire management and insect and disease management. Aside from the twenty year period between 1930 and 1950, the Service had placed very little emphasis on any form of vegetation management. This
deficiency was noted, in 1965, in an article which appeared in *Science* (284). Botanical concerns finally emerged on a level equal to those of wildlife management and the effects of pollution, during Dickenson's administration. This is peculiar, because there was no strong advocate of botany in the Washington office at this time.

**FIREPRO and NIIMS**

In 1974, the Bureau of Land Management and the Bureau of Indian Affairs developed a fire management program which could be used to obtain funds based on what became known as the Normal Fire Year Plan (later known as Normal Fire Year Program). In 1981, the NPS adopted this program under the title "FIREPRO." The Plan or Program was computer generated and was based on fire history, weather data, fuels and other factors. The first two years of the program were very successful, with a select group of parks receiving funding to establish reliable fire management operations. Unfortunately, austere budgets cut deeply into the fund source, leaving only a remnant in 1983, 1984 and 1985.

In 1982, the agency adopted the National Interagency Incident Management System (NIIMS) for use in fire emergencies as well as search and rescue missions, law enforcement incidents, and special events. The heart of this system is an on scene management structure which can be utilized to deal with any type of emergency.

**External Activities**

This period also saw greater emphasis on activities which were beyond park boundaries, but, which had direct influences on
park resources. Concern over the effects of acid rain and other air pollutants was heightened (267, 251, 241). Canyonlands National Park was threatened with the installation of a high level nuclear waste storage facility within close proximity of its boundary (254).

Land Protection

Finally, Dickenson's administration saw a re-alignment of policies related to real estate management. Under the direction of Secretary Watt, all areas which were actively involved in land acquisition were required to complete Land Protection Plans. The emphasis of these plans was on analysis of the Service's need to acquire land and on making a determination as to whether or not "fee simple" acquisition was really necessary for resource protection. Although this should have been the basic premise for land acquisition all along, it was believed that the Service would always seek "fee simple" ownership unless legislation would not permit it. "Fee simple" ownership exists when the agency purchases or otherwise acquires full title to a tract of land.

Publications

The scientific publication program of the Service slowed down considerably during Dickenson's administration. No doubt financial limitations had an influence on this. Decentralization may have also governed the ability of the agency's scientists to publish. The Washington office's commitment to the scientific publication program dissolved when this clearinghouse function was transferred to the Southeast Regional Office in 1985.

During the fall of 1980, the Pacific Northwest Region
started publishing a periodical titled "Pacific Park Science." Shortly thereafter, the scope of the publication broadened and its title was changed to "Park Science." This periodical is particularly important because it provides a single forum for exchange of information about resources management activities within the agency.

Both of these programs reinforce the decentralization philosophy, with both housed in regional offices.

Between 1981 and 1983, the natural resource management staff proposed preparation of a series of guidelines on an extensive number of topics including integrated pest management, cave management, surplus animals management, hazardous animals management, backcountry management, wildlife management, fisheries management, etc. (151). None of these were ever actually published because of a loss of interest stemming from the 1983 reorganization. In addition, the National Wildfire Coordinating Group started publication of a series of interagency handbooks which established uniform fire management procedures (25,26,27,28).

Following establishment of the air and water quality staff and the geographic information systems unit, within the natural resources management umbrella, a series of general and technical manuals designed for use by park managers was published (115,100,93,79,114,111,108,81,87).

Success at the Redwoods

In previous chapters, it was indicated that Redwoods National Park would present an entirely new set of challenges to
the natural resource manager. Since 1978, perhaps the world's largest watershed and landscape rehabilitation program has been underway.

The rationale behind this unprecedented national park legislation was not only to save additional remnants of virgin forest. Some 36,000 acres of the new parklands were among those that had been denuded, battered, and burned. The federal government could now take direct and prompt remedial action toward reversing this devastation. Parklands that were once jeopardized by erosion from this area could now be saved.

Toward this end, Congress authorized a ten to fifteen year expenditure of $33 million for watershed and landscape rehabilitation in the park. In anticipation of park expansion, several small, experimental erosion control and revegetation projects had been implemented within the park the year before....

So enormous was the task that some expressed serious doubts about the project's potential for success. Yet, the administrators, hydrologists, geologists, plant ecologists, and laborers that then superintendent Robert D. Barbee assembled took on the challenge with enthusiasm and dedication....

Today, after seven years' work and expenditure of about half the authorized funding, there are already spectacular results. (255)

Policies

No major policy changes were undertaken by Mr. Dickenson. Rather, emphasis was placed on renewed commitment to park preservation ideals. Perhaps the Director felt that policies were adequate but, a more likely conclusion is that politically it was more astute to maintain the status quo.

During 1980, the Fish and Wildlife Service quietly began drafting a National Fish and Wildlife Policy for eventual release as an executive order and as possible legislation. The first draft of that policy concentrated on federal state relations, yet was woefully ignorant of existing responsibilities and laws. In particular, it could have required the Park Service to seek state permission before banning hunting in units of the Park System. NPCA criticism and comments resulted
in the addition of language that specifies that the policy will not allow hunting, fishing, or trapping in Park System units except where authorized by Congress. (244)

The previous chapter pointed out deficiencies regarding the agency's fishing policy. In 1982, in an article by Thomas Bonnicksen and Edward Stone, the ambiguities of vegetation management policies were outlined (248). This ambiguity rested in the fundamental meaning of the goals outlined in the Leopold report. Clearly several policies related to natural resources management needed to be updated or finalized.

As mentioned previously, Dickenson did provide some clarification of the agency's pesticide use policy.

**The George Wright Society**

The George Wright Society, created in 1980, is an affiliate of the Service. Robert Linn, a former Chief Scientist of the Service, founded the Society in 1980 and started publishing a quarterly titled the "George Wright Forum." The Society is "dedicated to the protection, preservation, and management of cultural and natural parks and reserves through research and education," and is named after George M. Wright, who was instrumental in establishing the agency's wildlife management programs in the 1930s.

**Dickenson Retires**

When Russell Dickenson announced his retirement in the early part of 1985, some degree of stability had returned to the
agency. Dickenson had weathered a change in political affiliation of the administration, he had taken positive, though only initial, steps toward improving employee morale, and he had elevated the natural resources management function within the Washington office. Although he was faced with many constraints, he provided direction and set the tone for future improvements in the management of park resources.

On May 29, 1985, William Penn Mott, Jr. replaced Mr. Dickenson.
This review of the history of natural resources management in the National Park Service has revealed the following conclusions:

1) Natural resource management, like most functions within a government agency, has changed in response to personal efforts, scientific theory, legislative mandate and political whim. This history has outlined examples in each of these areas.

2) Generally those changes have been for the better, in terms of resource protection.

3) Some events and issues are recurring or reappearing with a degree of regularity.

4) Finally, this history is still unfolding and a sizable agenda is still before the agency.

Each of these will be discussed briefly.

Natural Resources Management and Changes

During the 113 years of the National Park Service history addressed in this account, the author feels that several important changes or turning points are the most significant.

The first significant change came when predators were given equal standing with other wildlife species. This was followed by the acceptance of a policy which forbids the introduction of exotic species into the parks. During the 1930s, George Wright revolutionized the agency's thinking in terms of
wildlife management but fire and forest insects and diseases were still subject to complete control. It took almost fifty years for the Service to gain a clear philosophical direction in the management of all park resources. This direction came with the issuance of the Leopold report. Although the report emphasized management of wildlife populations, other elements of the park ecosystem, such as vegetation and fire, were also discussed. The principles outlined in the Leopold report were accepted and put into practice.

Foremost in this switch in philosophy of the mid 1960s, was recognition of the vital role that naturally occurring fire, native insects and native diseases play in the environment. Similarly, the de facto implementation of Walker's policy on allowing the natural dynamics of barrier islands to continue unabated, is indicative of the acceptance of the Leopold report. Unfortunately, the size and boundary configuration of most parks prevented the development of self sustaining natural systems.

Recognition of the preference to manage park resources in concert with natural processes and on an ecosystem level finally came to fruition with the passage of the Alaska National Interest Lands Conservation Act. Now thinking is going beyond this stage in proposing that parks serve as genetic reservoirs and as base lines of data useful in determining the effects of man on the environment.

Recurring Events and Issues

If one steps back and reviews the historical development
of natural resource management within the NPS, it becomes apparent that certain topics were the focus of the agency on a recurring basis. Those topics can be grouped under the headings of Wildlife Management, Threats to the Parks, Personnel, Lands Management and Legislation.

**Wildlife Management.** Protection of wildlife resources has been and continues to be a major issue. The issue first appeared in the form of predator control. During the 1920s and 1930s attention was turned to ungulate overpopulation which resulted from predator control. Artificial feeding of wildlife species developed as a means to help those ungulate populations. During the 1930s, 1940s, and 1950s, the agency repeatedly attempted to address the overpopulation problem. Definitive action came in the 1960s. Authorization of the Endangered Species Act, in 1973, turned attention to species which were nearing extinction. More recent concerns have centered on feral and exotic species, as well as, restoration of extirpated populations. Although predator control and artificial manipulation of species appear to be dead issues, the Service is still faced with many of the same wildlife problems which were identified in the late 1920s. Perhaps the intrinsic popularity of wild animals, has spurred continued emphasis in this field.

**Threats to the Parks.** Certainly the "State of the Parks Report", prepared during the Dickenson administration, was the most widely known, but, it was only one in a series of similar reports. Mather prepared the first such report in 1920. Newton

The 1980 "State of the Parks Report" was not the first, but, it certainly was the most shocking in terms of identifying how threatened the Park System really was. The simple fact that the Park System had expanded, increased the number of threats. Undoubtedly, the energy shortage also contributed to a sharp increase in threats. Without question the parks will continue to be threatened and, so, perhaps, the periodic reports may also continue.

**Personnel.** Three issues within this field seem to have been identified on a number of occasions. The first was a lack of field personnel to carry out wildlife, and later, natural resources management activities. The need was first identified by George Wright in the 1930s. In the late 1950s "wildlife rangers" were assigned to certain parks, but the number fell far short of the need. Finally, after fifty years, the Service came to grips with the issue and took definitive action to resolve the problem. In 1982, a formal training program was developed and executed to prepare a cadre of Natural Resources Management Specialists. This effort was followed by a similar developmental program which began in 1984.

Secondly, the relationship between the natural resource
manager and the natural scientist has been addressed repeatedly. In the late 1920s, and early 1930s a clear distinction existed between the Supervisor of Wildlife Resources (the manager) and the Wildlife Division (the scientists). By the mid 1930s the distinction was dissolved, only to reappear in the 1960s when Wirth re-established managerial and research functions. As the research program gained momentum and strength, during the 1960s and 1970s, it began to overshadow the resource management function. In fact, during the 1978 reorganization, the Natural Resource Division was absorbed under an Associate Director for Science and Technology. In 1981, once again, the managerial and research functions were split. By 1983, the pendulum moved toward unification of the two groups with emphasis on management. Much of the Natural Science Division, which was created in 1981, was broken up. Scientific expertise was to reside in the regional offices and in some cases in the parks themselves. The Washington office was to focus on overall program management and policy formulation.

Finally, as originally conceived by Mather, the agency has regularly relied on other federal agencies to provide subject matter expertise in dealing with resource problems. Numerous cooperative agreements have been generated over the years to formalize that relationship. This philosophy is applied today in areas like forest insect and disease management, wildlife management, soil conservation, endangered species management, and marine fisheries management.
Lands Management. The authorization and establishment of federal parks has directly affected the management of park resources. This influence has, in the most fundamental sense, been seen in the types of land bases which have been acquired. Volcanic sites require different management strategies from coral reefs and so forth. In addition, legislative boundaries have either worked to the benefit of the resource managers, or in other cases, they have actually complicated resource problems. Furthermore, the political circumstances surrounding the parks' authorization and establishment, have sometimes set the bounds within which the resource manager is to work. The Yellowstone Act gave rather specific direction as did the legislation authorizing Redwoods National Park. Furthermore, the designation of units as "preserves" and "recreation areas" automatically allows certain visitor activities which impact the resources and which create many problems for the resource manager. Finally, land acquisition methodology seems to be a recurring issue. The first parks were carved out of the public domain. Purchase of parkland was seen for the first time in 1960s. During the Dickenson administration, land protection policies were given very close scrutiny.

Legislation. Once again, the passage of various pieces of legislation has consistently served as a tool in the hands of the resource manager. The value of these laws has increased as they have been refined over time. At the same time, much of this legislation has increased the workload of the resource manager.
NEPA requires holistic thinking and public participation in planning for the management of park resources. The Clean Air Act, as amended, burdens the Service with air quality monitoring and mining legislation necessitates specialized knowledge pertaining to mineral extraction. Despite the additional effort required, a sound legal framework goes a long way toward resource protection.

**Trend of De-emphasis.** Another trend which has developed is one of oversight with regard to certain park resources. Outside of the thirty year period when John Coffman was the agency's Chief Forester, very little attention has been given to botanical resources. Even when the agency had a Forestry Division, heavy emphasis was placed on tree preservation and fire control. Very little effort was put into the management of herbaceous plants. Although this has changed somewhat, vegetation management still takes a back seat to other programs.

A similar pattern can be traced for the geological program of the agency.

Major, consistent voids in program emphasis have existed throughout the agency's history in terms of entomology, meteorology, herpetology, range management and agronomy. This is not to say that nothing has been done in these fields, but, rather to point out that program emphasis has been unbalanced.

**An Open Ended Story**

The author has not attempted to address all resource management concerns of the agency. A sincere attempt has been made to identify those which were most important, as well as a
few which added color to the story. As a result the history is open ended and incomplete.

Despite the great strides made by the agency over the past 113 years, major issues still remain unresolved. Fishing is still condoned in the parks, even though it is contrary to all other wildlife policies. Although exotic species are to be eliminated from the parks, the question of naturalization has not yet been addressed. At what point is it futile to attempt to remove an exotic species? This is question is particularly pertinent when one discusses exotic birds and plants.

Threats to the parks will continue. How will the Service protect park resources from the adverse effects of activities going on outside of the park boundaries? Will the concept of a buffer zone, in which the Service can control non agency activities, ever become a reality?

The Alaska National Interest Lands Conservation Act permits subsistence use of park resources. Since the Act is not yet five years old, it is impossible to determine if this use will detract from the integrity of the resources. Historically, it has not, but, only time will tell whether or not this will be an issue.

What of the Leopold report? Is the illusion of primeval America achievable? Does it have to be achieved? What of the relationship between the resource manager and the scientist? Although this relationship has been clearly described on at least two occasions, has this relationship been accepted throughout the agency? (120,22) What about adequate funding? This was a very
high priority in the recently released Conservation Foundation report on the national parks. The Foundation proposed a ten year program titled "Preservation '95" which would provided large amounts of money for resource management. (1)

An issue of organization remains unaddressed. An examination of the Washington office staff charged with the responsibility of managing the natural resources program of the agency, reveals some rather glaring voids. Although a Division of Biological Resources exists, in the author's opinion, that office does not have sufficient personnel to manage all fields within the umbrella of its responsibility. Staff experts in botany, forestry, aquatic biology, coastal systems/oceanography, entomology, pest management, and endangered species are essential. As well, experts in the various fields of zoology are needed. Expertise in the areas of mammalogy, herpetology, paleontology, ichthyology, genetics, and animal behavior is considered to be minimally acceptable.

In addition, the Service needs to re establish a geological and pedological staff. Subject matter specialists would be few in number, but they would have expertise in soils, caves, glaciology, volcanology, geothermal phenomena, and coastal systems.

The fire management staff should be augmented with a fire ecologist to broaden the perspective on fire in the parks beyond that of suppression. Although many of the larger parks have this expertise on their staff, most of the smaller parks receive no benefit from the situation.
Finally, a curatorial position, with emphasis on natural history objects, should be established as well as a chief meteorologist.

Almost all of these fields had representation in the Service at one time. It is worthy of reconsideration.

Summary Comments

The following quotations set a context in which natural resources management must continue within the National Park System:

The national parks are charged with the obligation of preserving superlative natural regions, including wilderness areas, for the benefit of posterity. Attentiveness to the pleasure and comfort of the people is essential, but it cannot mean catering to absolutely unlimited numbers unless the second function is to destroy the first. In a theater, when the seats in the house have been sold out and the available standing room also has been preempted, the management does not jeopardize the main event by allowing still more onlookers to crowd upon the stage and impede the unfolding drama. C. F. Brockman (83)

... the long term National interest must govern the decision on any proposal that would destroy, impair or even modify any part of the natural scene in any part of the national park system or that would injure or destroy any historic or prehistoric landmark that has been set aside for preservation and for public enjoyment ... if these great possessions of ours are 'whittled away'; if they are allowed to be impaired for any but the most compelling reasons, the process is bound to be cumulative, and the end product will be mediocrity. Oscar L. Chapman (83)

How to live up to this trusteeship is ever the question before the National Park Service. It recognizes a duty, not only to protect but to make the parks available to the people for whom it is trustee, a duty to make sure that Americans know and understand this great heritage and the threats that menace it. For only thus can we assure the perpetuation of the great places of America. Newton B. Drury (83)
So we see that national parks are really national museums. Their purpose is to preserve, in a condition as unaltered as is humanly possible, the wilderness that greeted the eyes of the first white men who challenged and conquered it. It is to insure that the processes of nature can work, without artifice, upon all living things, as well as the earth forms, within their boundaries. It is to keep intact in the wilderness areas all the historic and prehistoric evidences of occupation by our predecessors. And in doing these things, the extra reward of recreational value emerges. Freeman Tilden (83)

Without question, the legislative paradox found in the agency's organic act and so frequently cited, is not a paradox at all. Each of these authors has expressed, in their own terms, the fact that resource preservation must take the upper hand. Natural resources management is of transcendent importance to the preservation of the parks and to assurance of visitor enjoyment.
LITERATURE CITED

I. PRIMARY SOURCES

A. Government Documents and Related Books


52. _______ Annual Report of the Director of the National Park Service to the Secretary of the Interior. 1924. [by S. T. Mather]. [Washington: National Park Service, 1924].


78. ______ Annual Reports of Field Divisions of the National Park Service. [Washington: National Park Service, 1932].


85. ________ Forest Conservation on Lands Administered by the Department of the Interior. [Washington: Department of the Interior, 1940].


110. _______ Range Management Handbook. [by H. M. Ratcliff].
[Omaha: Region 3, National Park Service, 1944].

111. _______ Specific Conductance and pH Measurement in Surface
Waters: An Introduction for Park Natural Resource Specialists.

112. _______ State of the Parks – 1980 – A Report to the

113. _______ State of the Parks: A Report to the Congress on a
Strategy for Prevention and Mitigation of Natural and
Cultural Resources Management Problems. [Washington:
National Park Service, 1980].

114. _______ Strategies for Monitoring Water Quality Impacts
in Parks. in progress. [Ft. Collins: National Park Service].

115. _______ Water Management in Park and Recreation Areas. WRFSL -

116. _______ Wildlife Conditions in the National Parks. 1941.

117. _______ Wildlife Management Handbook – Part II, Aquatic
Resources, Natural and Historical Areas. Release 1.

118. _______ Wildlife Management in the National Parks. 1961–

119. _______ Wildlife Management in the National Parks. 1962–

120. Wauer, R. H. The Role of the National Park Service Natural
Resources Manager. Washington: National Park Service,
1980.

121. Wright, G. H., J. S. Dixon, and B. H. Thompson. Fauna of the
National Parks of the United States – A Preliminary Survey
of Faunal Relations in National Parks. Washington:

B. Letters

122. Brockman, C. Frank. Personal correspondence with the writer.
February 20, 1985.

123. Cahalane, Victor H. Personal correspondence with the writer.


126. Kraebel, Charles. Correspondence with the Director, National Park Service. October 15, 1926.


133. Sumner, E. Lowell. Personal correspondence with the writer. no date.


139. Wauer, Ro. Personal correspondence with the writer. no date.

140. Wirth, Conrad. Personal correspondence with the writer. no date.
C. Oral History Transcripts


D. Archival Material

145. Conferences File, National Park Service Archives, Harpers Ferry, West Virginia.

146. Conservation History File, National Park Service Archives, Harpers Ferry, West Virginia.

147. Fire Control File, National Park Service Archives, Harpers Ferry, West Virginia.

148. Forest Fire Reports, 1928 - 49, Records of the National Park Service, Record Group 79, National Archives Building, Washington, DC.

149. Forestry File, National Park Service Archives, Harpers Ferry, West Virginia.

150. George Hartzog File, National Park Service Archives, Harpers Ferry, West Virginia.

151. Management Biology File, National Park Service Archives, Harpers Ferry, West Virginia.

152. Mission 66 File, National Park Service Archives, Harpers Ferry, West Virginia.


157. Research File, National Park Service Archives, Harpers Ferry, West Virginia.

E. Proceedings and Transactions


II. SECONDARY SOURCES

A. Government Documents, Books and Unpublished Material


B. Periodicals


LITERATURE CONSULTED

A. Government Documents and Related Books


B. Periodicals


Finley, W. L. and I. Finley. 1940. To feed or not to feed ... that is the bear question. American Forests. 46(8):344-347, 368, 383-384.


C. Transactions and Proceedings


APPENDIX A

CHRONOLOGY OF NATURAL RESOURCES MANAGEMENT

AND

NATURAL HISTORY LITERATURE
The following list is a summary of important documents which have been produced by or for the National Park Service. All citations are related to the management of park resources. Dates listed in parentheses following titles indicate revisions and reissuances. Bibliographic data on most titles is found in the Literature Cited or the Literature Consulted Sections.

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<td>1930</td>
<td>Geologic History of Yosemite Valley</td>
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Birds and Plants of Rocky Mountain National Park

1933

Fauna of the National Parks of the United States - A Preliminary Survey of Faunal Relations in National Parks - Fauna Number 1
History and Present Status of Breeding Colonies of the White Pelican
Ferns and Flowering Plants of Isle Royal, Michigan
Plants of Rocky Mountain National Park
The Geology of Rocky Mountain National Park
The Geology of Devils Tower National Monument

1934

Forest Problems in Eastern National Parks

1935

Manual of the Branch of Forestry (1938)
Fauna of the National Parks of the United States - Wildlife Management in the National Parks - Fauna Number 2
Tree Bracing - Tree Preservation Bulletin #3 (1938,1959)
A Report on the Geology of the Southwestern United States

1936

Report on the Fire Control Training Conference - Great Smoky Mountains National Park
Research and Education in the National Parks
Shade Tree Pruning - Tree Preservation Bulletin #4 (1955)
Ropes, Knots, and Climbing - Tree Preservation Bulletin #7 (1955)
Plants of Yellowstone National Park

1937

Checklist of Birds of the National Parks

1938

Birds and Mammals of Mt. McKinley National Park - Fauna Number 3
Manual of the Branch of Forestry (revised)
Park and Recreation Structures - 3 Parts
General Spraying and Other Practices - Tree Preservation Bulletin #6 (1953)
Preliminary Checklist of Plants of the Western National Parks
Tree Bracing - Tree Preservation Bulletin #3 (revised)

1939
Wildlife Conditions in the National Parks
Fire Protection Training Handbook
The Evolution of Predator Control Policy in the National Parks

1940
Ecology of the Coyote in Yellowstone - Fauna Number 4
The Status of Wildlife in the United States
Forest Conservation on Lands Administered by the Department of the Interior
Transplanting Trees and Other Woody Plants - Tree Preservation Bulletin #9 (1954)

1941
Wildlife Conditions in the National Parks - Conservation Bulletin #3
Forests and Trees of the Western National Parks - Conservation Bulletin #6

1942
Wildlife Portfolio of the Western National Parks
Fading Trails - The Story of Endangered American Wildlife
The Giant Sequoias of California

1943
Prevention and Control of Fire Losses

1944
The Wolves of Mount McKinley - Fauna Number 5
Range Management Handbook - Region 3
Restoration of Wild Bison

1945
Research in the National Park System and Its Relation to Private Research and the Work of Research Foundations

1947
Natural History Handbook Series begins
Wildlife Resources in the National Park System - A Report on Wildlife Conditions
Flora of Mount Rainier National Park

1948
Conserving Wildlife in the National Parks
Wildlife Resources in the National Park System - A Report on Wildlife Conditions
1949  The Dilemma of Our Parks

1950  Wildlife Resources in the National Park System - A Report on Wildlife Conditions of Mount Rainier National Park

1951  Wildlife Resources in the National Park System - A Report on Wildlife Conditions

1953  General Spraying and Other Practices - Tree Preservation Bulletin #6 (revised)

1954  Forests and Trees of the National Park System
     Transplanting Trees and Other Woody Plants - Tree Preservation Bulletin #1 (revised, previously #9)

1955  Shade Tree Pruning - Tree Preservation Bulletin #4 (revised)
     Ropes, Knots, and Climbing - Tree Preservation Bulletin #7 (revised)
     Report on the Seashore Recreation Survey of the Atlantic and Gulf Coasts
     Our Vanishing Shoreline

1956  Safety for Tree Workers - Tree Preservation Bulletin #2 (previously #8 - date of original release undetermined)

1957  The National Park Wilderness

1958  Handbook for Fire Lookouts

1959  Tree Bracing - Tree Preservation Bulletin #3 (revised)
     Our Fourth Shoreline
     Pacific Coast Recreation Area Survey

1960  United States Department of the Interior Forest Conservation

1961  The Bighorn of Death Valley - Fauna Number 6

1962  Wildlife Management in the National Parks, 1961 - 1962
     Get the Facts and Put Them to Work
     Mammals of Mount McKinley National Park

1963  Wildlife Management in the National Parks, 1962 - 1963
Advisory Committee Report to the National Park Service on Wildlife Management (Leopold Report)
Advisory Committee Report to the National Park Service on Research (Robbins Report)

1964

Wildlife Management in the National Parks and Monuments of New Mexico
Fire Control Handbook - Release #1
Fire Control Handbook - Amendment #1
Predator and Rodent Control in the United States

1965

Natural Sciences Research Handbook - Release #1
Interim Guidelines for Wildlife Management in Recreation Areas
Fire Control Handbook - Amendment #2

1966

The Wolves of Isle Royale - Fauna Number 7
National Registry of Natural Landmarks Handbook - Release #2
Natural Sciences Research Handbook - Release #2
Wildlife Management Handbook - Part II Aquatic Resources - Natural and Historical Areas - Release #1

1967

"Natural Resources" newsletter begins
Biological Research and Management in the National Park Service - A History

1968

Annual Report - Office of Natural Science Studies
Natural Resource Management Handbook - Release #1
Proceedings of the Meeting of Research Scientists and Management Biologists of the National Park Service
Public Use of the National Park System 1872 - 2000
Fire Control Handbook - Release #2
Fire Control Handbook - Release #3

1969

Annual Report - Office of Natural Science Studies
Natural Resource Management Handbook - Amendment #1
Man and Nature in the National Parks
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<tr>
<th>Year</th>
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<tr>
<td>1970</td>
<td>Proceedings of the Meeting of Research Scientists and Resource Managers of the National Park Service Administrative Policies</td>
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<td>1971</td>
<td>Fire Administrative Guideline - Release #1 Urban Ecology series begins</td>
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<td>1972</td>
<td>Annual Report - Office of Natural Science Studies Another Look at Wildlife in the National Park System Part Two of the National Park System Plan - Natural History National Parks for the Future</td>
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<td>1973</td>
<td>The Bison of Yellowstone -- Scientific Monograph #1 (Monograph Series begins) Annual Report - Office of the Chief Scientist A Strategy for Management of Marine and Lake Systems within the National Park System Planning and Design Process</td>
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<td>1974</td>
<td>Annual Report - Office of the Chief Scientist Ecological Services Bulletins begin Natural History Theme Studies begin</td>
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<td>1975</td>
<td>Annual Report - Office of the Chief Scientist Annual Report - NPS Science Center Historical Overview of Resources Management in the National Park Service Planning Process Guideline - Release #1</td>
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<td>1977</td>
<td>A Review and Recommendations Relative to the NPS Natural Science Program</td>
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Pest Control Guidelines and Program
Environmental Assessment

1979
Proceedings of the Second Conference on Scientific Research in the National Parks
Review and Evaluation of NPS Fisheries Policies and Practices
Pacific Northwest Region Annual Science Report
Fire Management Guideline – Release #1
Instructions for Preparation of Water Resource Management Plans

1980
State of the Parks Report – 1980
Pacific Northwest Region Annual Science Report
The Role of the National Park Service Natural Resources Manager

1981
A Review and Recommendations on Animal Problems and Related Management Needs of the National Park System
Pacific Northwest Region Annual Science Report

1982
Pacific Northwest Region Annual Science Report
National Parks in Crisis
Water Management in Park and Recreation Areas
Draft and Interim Guidelines for Pesticide Use in NPS Areas

1983
NPS Air Resource Management Manual—Draft

1984
NPS Scientific Monograph Series Guidelines and Review Procedures
Maps and the Manager – A Manager's Guide to Resource Information Systems – Volume 1

1985
National Parks for a New Generation Visions, Realities, Prospects
APPENDIX B

GLOSSARY

OF

NATURAL RESOURCES MANAGEMENT TERMS
DEFINITION OF TERMS

Administration. Management of finance, personnel matters, property and records, and other office and business type functions. In National Park Service usage, administration generally refers to the field of the Division of Administration rather than to over all management and direction. However, the meaning is broadened in certain of usages, as in the title of the Administrative Manual which covers all Service activities.

Adverse Use. Any use of a park or its resources which conflicts with the purpose for which the park was established. Adverse use is not as strong a term as "misuse" and does not necessarily refer to flagrant or seriously damaging departures from appropriate use.

Appropriate Use. Use in accordance with the purpose of a park as stated in basic legislation relating to it; in general, use that is related to appreciation and enjoyment of park values and is compatible with keeping the parks unimpaired for future use of the same type.

Archaeological Parks. Parks established primarily because of their significance as to pre-Columbian American Indian cultures or other prehistoric cultures.

Architect. A group of Service positions concerned with the design and construction of buildings or with the preservation and restoration of historic buildings, and requiring professionally qualified employees in this fields.

Area. A part or section of a park distinguished by a special status, use, or characteristic, or by its relation to a feature; e.g., natural area, developed area, devastated area, Old Faithful Area. The term "area" was formerly used in referring to a park or any unit of the National Park System but the term "park" is prescribed for use in that sense wherever possible.

AUM - Animal Unit Month. A statistical unit of livestock grazing or browsing, consisting of the equivalent of one animal's presence for one month on a given range or on pasture in a park. Wildlife grazing and browsing is usually difficult to compute in terms of AUM's and thus is more often expressed by carrying capacity in number of animals.

Backcountry. A part or parts of a park beyond main developed use areas and generally not accessible to vehicular travel. Backcountry is characteristically of
primitive or wilderness nature, of considerable dimensions, and accessible, if at all, only by horse or foot trails or in some cases by unimproved roads.

**Basic Legislation.** This term is most commonly used to designate the 1916 Act of Congress establishing the National Park Service and stating its functions, but also refers to other acts originating important policies or containing general authorities pursuant to which parks may be established and major endeavors undertaken by the Service; for example, the Antiquities Act, Historic Sites Act, Trust Fund Act, and the Park, Parkway and Recreational Area Study Act. The Yellowstone Act of 1872, though primarily concerned with basic legislation for that park, contains elements of basic legislation applicable to the entire National Park System.

**BIFC - Boise Interagency Fire Center.** An organization established in the mid 1970s to centralize Federal fire management expertise and activities.

**Biosphere Reserve.** An area of international significance set aside to preserve genetic diversity and which is available for long term research.

**BRC - Blister Rust Control.** An operating program directed toward the protection of five needled or white pine species from white pine blister rust, destructive fungus disease introduced from the old world.

**Browse.** Parts of woody plants fed upon by herbivorous animals, as distinguished from grass and similar non woody plants upon which animals "graze".

**Carrying Capacity.** Specification of some (1) level of use (2) which will allow for the perpetual maintenance (3) of some level of environmental quality (4) within some management objective level set with respect to the cost of maintenance resource quality (5) at a level which will provide resource user satisfaction.

**Civilian Conservation Corps (CCC).** An interagency organization established during the 1930s as a component of the New Deal and employing individuals on a wide variety of conservation projects.

**Coastal Zone.** Coastal waters and adjacent lands that exert a measureable influence on the uses of the sea and its ecology.

**Conservation (park).** Those measures of park management directed toward perpetuating park resources unimpaired for the enjoyment of present and future generations. In Service usage, conservation is inclusive of preservation and provision for appropriate use.
Cooperative Park Study Unit (CPSU). An office established at a college or university through a cooperative agreement. Staff assigned to this unit focus on research with applications in a park setting.

Cover Type. The type of vegetation or plant society in a given area, described by dominant species, age, and form; as, grassland, pine fir forest, oak woodland, fir reproduction, mixed brush, pinyon juniper, etc. Designation by cover type provides a means of identifying, classifying, or grouping land areas according to type of plant cover they support; which is useful in land management, fire control, and for other conservation purposes.

Damage. Any destruction, disturbance or change in a park that diminishes its park values and lessens its usefulness for understanding and enjoyment by the people and for their inspiration and recreation.

Developed Area (Zone). A place in a park where physical improvements for visitor use and/or Service functions are concentrated. A developed area has a appreciable number and usually a variety of improvements such as buildings, utilities, parking areas, etc.

Ecological Services Laboratory (ESL). During the late 1960s and early 1970s an arm of the agency's science organization. Between 1976 and 1985, the name used by the National Capital Region's laboratory.

Ecosystem. The interacting system of a biological community and its non living environment.

Encroachment Intrusion of development, use, or exploration, which damages or alters park features or values. This term is most often used in connection with developments or uses not fully in keeping with the precepts of preservation and appropriate use governing the National Park System.

Environment. The sum of all external conditions and influences affecting the life, development and ultimately, the survival of an organism.

Environmental Assessment (EA). An activity that involves the consideration of the interaction of physical, natural, social and economic factors and a determination of probable effects of the plan or proposal upon these operating systems.

Environmental Impact Statement (EIS). A document prepared by a Federal agency on the environmental impact of its proposals for legislation and other major actions significantly affecting the quality of the human environment.
Esthetic Values. The finer intangible and cultural park values as distinguished from material and economic values. Scenic beauty, inspirational values, the opportunity to see and appreciate nature, are esthetic; benefits of fresh air, sunshine, and a good place to camp, are more material.

Exclosure. A plot fenced to keep out or exclude certain animals, and in some cases, supplemented by eradication or other measures, to exclude certain plants as well. Exclosures are often required in research concerning the effect of certain organisms on the natural environment and in making forestry and wildlife studies.

Exotic. 1. A plant or animal, not native to the site, that has been introduced or has otherwise become established within a park. 2. Anything foreign to or not in keeping with the natural or historical scene or theme of a park. An intrusion.

Feral. The state of a normally domestic animal gone wild; for example, the feral (wild) goats of Hawaii National Park and burros of Death Valley National Monument.

F&FC - Forestry and Fire Control. An appropriation term (1960s) referring to an operating program in these fields, which is provided for under the Management and Protection appropriation. The main items covered are fire presuppression, suppression and prevention.

Fire Atlas. The graphic portion of the fire control plan for a park, consisting of maps showing fire control facilities, cover types, hazard and travel time zones, forest fire occurrence, etc.

Fire Control. All activities directed toward protection of the parks from fires of all kinds and from all causes. Fire control includes the three sub activities or functions of fire prevention, presuppression and suppression.

Fire Presuppression. Activities in advance of fire occurrence to insure effective suppression action. Includes recruiting and training, planning the organization, maintaining fire equipment and fire control improvements, and procuring supplies and equipment.

Fire Prevention. Activities directed at reducing the number of fires that start; including public education, law enforcement, personal contact, and reduction to fire hazards.

FIREPRO. A fire management program utilized to obtain funds. Adopted in 1981.
Fire Suppression. All work of extinguishing or confining a fire beginning with its discovery.

Fish - Chemical Control. The eradication or control of undesirable populations of fishes in park waters. The term "chemical control" is used in preference to the word "poison".

Fish Management. The program developed in accordance with established policies for the perpetuation and maintenance of fish populations in park waters. It entails investigations of aquatic resources, angler use studies, formulation and enforcement of angling regulations, restoration of natural conditions, and limited fish stocking (though primary reliance for fish for recreational angling is placed upon those naturally produced in park waters). Fish management differs from the management of other biological park resources in that fish may be taken by park visitors whereas other forms of park plant the animal life are fully protected.

Fish - Put and Take. Hatchery fish which are stocked for immediate return to the angle during the current season; in contrast to wild fish.

Fish Stocking. Placing of fish of any size in park waters to provide fishing for park visitors or to restore native fish populations. Fish stocked are usually obtained from hatcheries but may be transplanted from other natural waters.

Fish - Wild. Native or exotic fishes which have been naturally produced in park waters or which have been stocked as fingerlings during previous seasons.

Forest. The proper term, rather than "timber," for tree cover in a park, as park forests are not managed or cropped commercially but are preserved for their park values.

Forester. A group of Service positions involving substantially full time professional park forestry work. Forestry in the National Parks concerns conservation of the natural environment and protection of park values not management of forest for commercial purposes. The positions require employees who have been educated in forestry at a recognized forestry school or its equivalent.

FPC - Forest Pest Control. An appropriation term (1960s) referring to an operating program directed toward protection of forests from serious damage or destruction by insects and plant diseases. FPC funds covered all types of forest insect and disease control except white pine blister rust control, which was financed by a separate appropriation.
Game. A term not to be used in reference to park wildlife, as it implies animals or birds available for hunting.

Guideline. A document prepared to supplement agency policies which provides direction in basic agency operations.

Grazing. In a broad sense, the feeding of domestic and wild animals upon any kind of growing vegetation. However, gazing has a more limited meaning in certain usages, as in referring to grazing animals; distinguished from browsing animals.

Handbooks. Instructions and information necessary to accomplishment of specific jobs, compiled in convenient form for ready reference and for orientation and training purposes.

High Country. Mountainous sections of a park that may or may not be away from motor roads and other development.

IPM - Integrated Pest Management. A system of managing pests by using biological, cultural and chemical means.

Inclosure. A fenced plot as to inclose certain plants or animals for study or appropriate management purposes.

MAB - Man and the Biosphere. A United Nations program established to designate biosphere reserves and to carry on other activities for the improvement of the world wide environment.

Management. Over all direction and superintendence of activities, personnel, offices, parks, etc. The national Park Service and many other agencies employ the term "management" rather than "administration" to convey the meaning defined above.

Management Policies. Formal documents prepared to give the agency direction in very broad terms on all aspects of park operations.

Mission 66. A ten year program planned to provide an adequate National Park System, properly developed, managed and protected, for the use and enjoyment of the American people. It was launched in 1956, with the planned completion date in 1966 on the golden anniversary of the establishment of the National Park Service.

National Park System. The sum total of all federally owned units administered by the National Park Service, constituting an organized and mutually complementing system.

Native Species. Any biological form indigenous to the natural environment in a park; i.e., living there and adapted through the long term processes of nature.
Natural Area. A unit of wildland containing one or more recognized forest cover types that will be preserved in an essentially natural, undisturbed condition indefinitely and have been so recognized an identified by the Natural Area Committee of the Society of American Foresters. Natural areas are generally 20 to 1,000 acres in size and are established to perpetuate these forest types for research and study.

Natural Conditions. A state of things developed by processes independent of man and his works; as the original unspoiled and unaltered scene in a National Park. In this concept, man is referred to since his evolution from an aboriginal condition, as prior to that time he seldom made inordinate alterations upon his environment.

Natural Environment. A composite of all the elements in a biological community that remains unchanged or undisturbed except for relationships and influences among and between the members of the community. Also, the natural habitat of an organism, including all the factors with which nature has endowed the habitat.

Natural History. A field of science dealing with understanding and appreciation of nature. A major branch of the National Park Service interpretive program.

Natural History Handbook. A publication summarizing the natural history of a park in popular style for the use of visitors.

Natural Resources. All zoological, botanical, geological, hydrological, soil, and atmospheric features of a park.

Natural Resources Management. Those measures necessary to maintain or preserve the natural elements of a park and to neutralize the effects of man or exotic species on those elements.

Natural Zone. A planning term referring to an undeveloped and undisturbed zone within a park. Generally natural processes are permitted to run their course in these zones.

Non-conforming Use. Any use of a park, its lands, resources, or facilities, outside the purposes for which the park was established. While non conforming use is usually conflicting or damaging in some respect, it is not necessarily so in all cases.

Noxious Plant. Vegetation poisonous or irritating to people or animals.
Outlying Area. Minor developments and single purpose improvements away from developed areas.

Overuse. Any degree of use by visitors which results in:
(1) damage, destruction or loss of primarily resources of a park; (2) damage to replacable resources in excess of the ability to recover within a reasonable time; or, (3) impairment of opportunity for appropriate visitor experience, as for instance, by overcrowding.

Park Resources. The physical assets natural and historical contained in a park and considered in the sense of contriburting to its value for use as a park rather than for other economic uses or exploitation.

Parkscape,USA. An initiative undertaken in the 1960s as a follow up to Mission 66 aimed at improving aesthetics of parks and the image of the Service.

Predator. Fauna which feeds on other fauna.

Preservation. Protection of parks from damage, defacement, exploitation of their natural resources, or impairment of the natural or historic scene they present. Preservation is a more restrictive practice than conservation; the two terms should not be used synonymously.

Research Area. An area set aside in a park and protected from encroachment because of its special value for scientific research.

RBI - Resource Base Inventory. Photographic, mapped, written and computerized material which documents the resources found in a park.

RMP - Resources Management Plan. A document which outlines the resource related problems of a park with potential solutions.

RNA - Research Natural Area. An area set aside by a public or private agency specifically to preserve a representative sample of an ecological community, promarily for scientific and educational purposes.

S&MC - Soil and Moisture Conservation. An appropriation (1960s) term referring to a program directed at prevention of soil erosion and conservation of ground cover to prevent rapid runoff and maintain soil moisture. This was a cooperative venture with the Soil Conservation Service.

Special Use Zone. A planning term used for areas within a park where non traditional uses take place. Uses may include utility corridors, agricultural use, and other permitted activities.
SRP—Significant Resource Problem. A strategy used to gain funding to resolve important natural resource problems in the parks. The program was developed in the early 1980s and prioritized all important problems.

Threat. Any activity which may diminish the integrity of park resources.

Timber. Not a proper term for park forests. The word "timber" connotes forest and forest trees as a resource for lumbering and other types of wood utilization.

Type Mapping. Preparation of a map which displays like components of the natural world. Usually associated with mapping of vegetation but may apply to aquatic systems, soils, geology, and wildlife.

Unimpaired. The meaning of this term applicable to units of the National Park System may be summarized as: undiminished in park values for enjoyment by the people.

Unit. The approved term to be used when referring to a park in its relation to the National Park System.

Vista Clearing. Removal or trimming of brush and other growth as necessary to maintain a clear view at vista points, provide canopied views under large trees, preserve meadow vistas from encroachment of thickets, etc.

Water Right. The quantity of water from a given source which may be developed and used in compliance with governing laws, rules, regulations, and court decrees.

Water Rights Program. A National Park Service program aimed at acquiring or legally establishing rights to water adequate for all park needs throughout all units administered by the agency.

Watershed. A geographic term referring to a stream drainage area or an area from which surface water and streams all drain in the same general direction as on one slope of a ridge or highland.

Wetland. Swamps or marshes, especially as areas preserved for wildlife.

Wilderness. Popularly, any tract uncultivated and uninhabited by human beings. Undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural condition.
**Wildlife.** In the broadest sense, all wild fauna of the parks.

**Wildlife Management.** Those measures necessary to maintain the natural elements of the biotic communities in the parks and to neutralize the effects of the activities of man upon them.

**Wildlife Reduction Program.** The act of adjusting animal populations to the carrying capacity of the habitat, to retain or regain normal natural conditions.

Adapted from:


APPENDIX C

NATURAL RESOURCES MANAGEMENT POLICIES

1960 - 1978
NATURAL RESOURCE MANAGEMENT

POLICIES

1960s
WILDLIFE

The animals indigenous to the parks shall be protected, restored, if practicable, and their welfare in a natural wild state perpetuated. Their management shall consist only of measures conforming with the basic laws and which are essential to the maintenance of populations and their natural environments in a healthy condition.

Hunting. Hunting in areas of the National Park System is incompatible with their preservation in the manner contemplated by the authorizations for their establishment and will not be permitted, except as specifically provided by law.

Wildlife problems, especially those in relation to overpopulation, are to be solved effectively, but use of public hunting as a method of wildlife management aimed at readjusting animal populations to approximate natural biotic conditions is definitely not to be a solution.

Predatory Animals. No native predator shall be destroyed because of its normal utilization of any other park animal or plant, unless such animal or plant is in immediate danger of extermination, and then only if the predator is not itself a vanishing form. When control is necessary, it shall be accomplished by transplanting, or if necessary, by killing offending individuals and not by campaigns to reduce the general population of a species.

Species predatory upon fish shall be allowed to continue in normal numbers and to share normally in the benefits of fish culture.

Exotics. Nonnative forms shall not be introduced into parks. Any exotic species which has already become established in a park shall be either eliminated or held to a minimum provided complete eradication is not feasible, and the possible invasion of the parks by other exotics shall be anticipated and steps taken to guard against the same.

Native forms. Every native species in the areas of the National Park System shall be left to carry on its struggle for existence unaided as being to its greatest ultimate good, unless there is real cause to believe that it will perish if unassisted.

Where artificial feeding, control of natural enemies, or other protective measures are necessary to save a native species that is unable to cope with civilization's influences, every effort shall be made to place that species on a self-sustaining basis once more. The artificial aids, which themselves have unfortunate consequences, will then no longer be used.
Reintroduction. Any native species or subspecies which has been exterminated from a park shall be brought back if this can be done, but if a species has become extinct, no related species shall be considered a candidate for reintroduction in its place. If a subspecific variant of a species has become extinct, substitution of a closely related subspecies may be considered.

Adverse Biological Forces. Plants and animals which are inimical to the public health or welfare or which are destructive to historic, archeological or scientific structures, sites, features or records of primary importance shall be subject to neutralization or control.

Hoofed Animals. The numbers of native hoofed animals occupying a deteriorated range shall not be permitted to exceed its reduced capacity and, preferably shall be kept below the carrying capacity at every step until the range can be brought back to its original productiveness.

Artificial Feeding. No animal shall be encouraged to become dependent wholly or in part upon man for its support.

Captive Animals. Artificiality shall be avoided in the presentation of the animal life of the parks to the public. The preferred presentation shall be through wholly natural situations.

Management. Management measures or other interference with plant and animal relationships should be undertaken after properly conducted investigation. Approval of programs for the destruction and disposition of wild animals which are damaging the land, or its vegetative cover and of permits to collect rare or endangered species has not been delegated.

Endangered and Vanishing Species. The issuance of a scientific collector's permit must be based upon the abundance of the species in the park which the permit applies. Every request must be considered carefully, and the collection of endangered or vanishing species is restricted or prohibited.

FISHING

Recreational fishing within National Parks and Monuments shall be permitted under management programs directed toward the perpetuation, restoration, and protection of native species and wild populations of fishes and the protection of the natural aquatic environments and the ecological relationships of the associated fauna and flora. This activity shall be directed so as to not decrease the wildlife, scenic, scientific or historic values of the park.
Where Fishing is Excluded. Fishing may be excluded from specific waters when necessary to preserve aquatic or terrestrial species or habitats which are limited in distribution or when such activity materially decreases the enjoyment of the areas by the general public.

Native Species. The perpetuation, protection, and restoration of native species in safe numbers in waters where they originally were found shall be given primary consideration in any management plan whenever possible.

Native Nonsport Fishes. All species of fishes are fully protected, except those designated for recreational angling.

Native nonsport fishes shall not be reduced or eliminated except as may be unavoidable and incidental to the primary objective of extirpating an exotic unwanted population of fishes.

In any restoration plan, native nonsport fishes should be reintroduced as well as the sport fishes.

Hybrid Trout. Hybrid trout shall not be stocked in waters of National Parks and Monuments.

Stocking. Artificial replenishment of stocking may be employed:

1. To reintroduce native species into waters where they have become eliminated or seriously depleted by natural or man-made causes.

2. To maintain fish populations in selected and approved lakes which are capable of supporting fish life, but which lack sufficient natural spawning facilities to maintain an adequate fish population to meet the need of recreational angling.

Size of Fish to Stock.

1. Fingerling trout may be planted in lakes where competent study had determined a need for supplementary stocking.

2. The stocking of eyed-eggs, fry or fingerlings in streams shall not be practiced except to restore a depleted population of native trout. (Numerous qualified studies on streams of varying sizes throughout the country have demonstrated that where conditions are suitable for trout, natural populations are maintained at maximum carrying capacity by natural reproduction. Planting of eyed-eggs, fry or fingerling trout in streams to supplement this natural reproduction has proven to be of negligible or no benefit.)

3. Stocking of catchable size trout to provide "put and take fishing" is not compatible with the fundamental concept of the National
Park Service, therefore, the planting of fish for immediate recovery by the angler shall not be made in waters of national parks and monuments.

4. Adult wild trout may be transplanted to re-establish native species or depleted populations.

Stocking National Parkways. Recreational fishing within National Parkways is permitted under management programs and stocking procedures normally practiced by the State or States in which the Parkways are located. This activity shall be regulated by the National Park Service.

Each Parkway Superintendent shall designate Parkway fishing waters. When the impact of fishing pressure would create damage to Parkway, features and facilities, would produce hazardous traffic congestion or would result in unusual enforcement problems, individual waters may be closed to fishing and to stocking.

Stocking Exotic Species. Exotic species of fishes or other exotic animals, or any exotic species of aquatic plants may not be introduced or stocked in waters of the National Parks and Monuments except:

1. In waters where exotic fishes are established and the restoration of native species is impracticable.

2. Where adequate investigations have demonstrated that additional planting is desirable and necessary to supplement limited or nonexisting natural reproduction.

Management of Exotic Sport Fishes. In waters where exotic sport species of fishes are established, and they are valuable for angling and are ecologically compatible with the existing environment, and their replacement by native species is impracticable, the fishery for the exotic species will be managed in a manner similar to that for native forms.

When replacement of the exotic by the native species is practicable, the latter shall be encouraged to take over its former place.

Removal of Exotic Species--Eradication or Control. When exotic species have become dominantly established to the detriment of the native species, restoration of the original fish composition may be brought about by the removal of the undesirable exotics. Standard eradication methods; such as, chemical treatment or electric shocking may be employed. Also, these methods may be employed to control exotic species where complete elimination is not feasible.

The need for and techniques to be used for an eradication or control program shall be based upon adequate investigations by aquatic biologists.
Egg Taking. The taking of eggs from fishes for the purposes of artificial propagation within waters in national parks and monuments is rarely justified and should not be permitted until a thorough review has been made.

Protection of Virgin Waters. Lakes and streams which are barren of fish life shall remain in the virgin condition and shall not be stocked.

Artificial Improvement of Lakes and Streams. All forms of artificial improvement of streams or lakes for fishery management purposes which change the natural habitat and the surrounding landscape are prohibited, except that, when the aquatic environment has been so altered by man that restoration by natural means is improbable, measures may be taken to return the streams and lakes to a more natural condition.

Management by Regulations. To preserve the populations of native species and yet allow angling, sport fishing shall be controlled by regulations which provide for the conservation of native species of fishes and compatible management of introduced, established species. Limits shall be established so that the total catch will not exceed the natural productive capacity of the waters. Creel limits shall not be considered as "goals."

Fishery Investigations. The conservation and proper management of the fishery resources and angling as a recreational activity is dependent upon a complete knowledge of the status of the fish fauna and the angling pressures being exerted. Adequate and continuing investigations are vital to the successful preservation and management of this resource.

Commercial Fishing. Commercial fishing is generally noncompatible with National Park Service objective and shall be permitted only within national parks and monuments where this activity is specified by law. It will be conducted under restrictions which are designed to conserve and perpetuate the resource.

Publicity. Publicity regarding fishing within the areas of the National Park System shall be directed toward the recreational and esthetic values, and the appreciation of the unspoiled environment as a whole rather than emphasis on the catch. Information regarding angling will be factual and realistic with respect to fishing conditions. Promotional types of publicity are discouraged but this does not apply to release of information on subjects of conservation of aquatic resources, fish regulations, care of fish by anglers, or the place of angling in the national park experience.
National Recreation Areas

The Service shall administer, protect, improve, and maintain Reclamation reservoir recreation areas of national significance as national recreation areas.

Picnicking, camping, swimming, and boating are permitted at national recreation areas. Fishing is permitted in accordance with all applicable Federal, state, and local laws, except in posted areas. Hunting is permitted in accordance with all applicable Federal, state, and local laws, except in developed or consolidated public use areas designated by the Superintendent.
NATURAL RESOURCE MANAGEMENT

POLICIES

HISTORICAL AREAS

1973
DISCUSSION

National historical parks and monuments have been established to commemorate specific cultural eras, historical events, or persons representing the outstanding cultural landmarks in the development of the Nation. In each case the commemoration is of a specific time, or span of time, as well as of the event or person involved.

The evolution of the Nation and its indigenous cultures has been determined by the natural resources that it contains, as well as by the ideas and ideals of its citizens. Then, as now, natural resources were integral elements of the historic scene. While the interpretive theme of a historic area may be associated with man, a proper presentation cannot be made out of context with the total environment. This is not to imply, however, that the environments of all historical areas should be treated precisely like natural areas. Although many archeological and other historical areas, such as Theodore Roosevelt National Memorial Park and Fort Jefferson National Monument, contain prime natural values, most historical areas contain such environments as farms, pastures, woodlots, and lawns that require intensive management. These should be restored and maintained when restoration is necessary for proper visitor understanding of the historic scene and is otherwise practicable. It is not acceptable to post an interpretive sign in a mature second growth forest proclaiming "At the time of the battle this was an open field." Nor should interpretation rely on the visitor's
empathy to determine what a cornfield would look like where today stands a carefully mowed lawn. To the extent feasible, the same degree of attention should be given to the historical integrity of the environment as is given to historical structures. Presentation of the parade ground at Morristown, for example, should be as authentic as the presentation of the interior of the Andrew Johnson Home. Naturally, care must be taken to avoid re-creating conditions that lead to severe erosion and other landscape catastrophies.

The maintenance of historic land and water resources at acceptable standards demands the application of interdisciplinary knowledge and skills in order to offset the many complex problems and alterations associated with later activities and works of man and (where deemed inappropriate) the imprint of natural environmental succession.

**ADMINISTRATIVE POLICIES**

**Historic Resources Management**
Historic resources will be managed to preserve them as nearly as possible or practicable as they appeared at the time or period of the history they commemorate. Park activities and modern conveniences should intrude as little as possible on the historic scene. To assist in achieving these goals, a Historic Resource Management Plan should be prepared to guide management and assure continuity in management.

A Historic Structure Preservation Guide should be prepared for all major historic structures to guide management in their continuing preservation.

**Natural Resources Management**
Natural resources (forests, fields, fauna, etc.) will be maintained to resemble, as nearly as possible, the natural resource scene that occurred at the time or period of history being commemorated. In so doing, care will be taken to avoid re-creating conditions that lead to severe erosion and other human-caused landscape catastrophies. (See also *Soil and Moisture Conservation*, p. 42, this section; and *Cooperation with States*, p. 54, *Fish and Wildlife Management Policy* section.)

**Exotic Plants and Animals**
(See *Fish and Wildlife Management Policy* section, p. 51.)

**Landscape Management**
Programs of landscape management may be carried out at designated zones in historical areas for purposes of enhancing the historic scene generally which may include, but not be limited to:
1. Encouragement of certain species of plants.
2. Increasing the ability of certain areas to absorb public use through vegetative management.
3. Maintaining a certain stage of plant succession.
4. Retention or provision of open areas, meadows, vistas, etc., or planting of open areas to trees or shrubs.
5. Removal of exotic growth from the historic environment and the encouragement of the historic growth.
6. Management of landscape for educational or interpretive purposes.
7. Rearrangement as necessary of land contours, particularly in areas formerly denuded, mined, or excavated, to suggest or be compatible with the historical period of significance.

**Land Acquisition**

As funds permit, the Service should acquire such property interests—including scenic controls—in the non-Federal lands within the authorized boundaries of historical areas as may be needed to provide for effective management, visitor use, and the achievement of the primary purpose for which the area was established. Zones of acquisition should be set forth in the Land Use Plan of the Master Plan. All physical improvements or land uses on acquired property that are inimical to or inconsistent with the purpose, management, or visitor use of an area should be removed or discontinued. (See also Acquisition Zones, p. 48, Master Plan Policy section.)

To implement this administrative policy with a minimum of inconvenience to private owners involved, the following procedures have been developed: 1. In newly authorized areas (usually those authorized since fiscal year 1960) where federally owned lands are limited and privately owned lands are extensive, the priority of acquisition is as follows:

1. Land needed for preservation or protection of park values.
2. Land needed for development of facilities.
3. Unimproved land needed to prevent threatened development or use which would be incompatible with existing or potential park purposes.

Within each of the foregoing priorities, the Service will give primary consideration to the acquisition of land which the owner needs to dispose of for hardship reasons; and land which the owner, voluntarily, has placed, or intends to place, on the market for sale.

The land acquisition program is carried out in accordance with the specific legislative policies, if any, set forth in the legislation authorizing the area. In the absence of specific legislative directives, the land acquisition program is carried out as follows:

1. Purchases are negotiated on the basis of competent appraisals of fair market value.
2. Less than fee interests (see No. 3 below) may be acquired when they will meet the needs of the Service and are justified on cost.
3. Reserved use and occupancy by the owner for life or for a term of years is
allowed if purchase on this basis will meet the needs of the Service and is justified on cost.

4. Eminent domain proceedings are used only as a last resort when all reasonable efforts of negotiation have failed.

II. In the older national parks and monuments (generally those established prior to fiscal year 1960) and where most of the lands included within the areas are now in Federal ownership—usually 90 percent or more of the total acreage in the area—a more liberal acquisition procedure has been established. In these national parks and monuments, the relatively small amount of land in private ownership, for the most part, is devoted to historic uses related to the early settlement of our Nation. Except as a specific property may be needed in rare instances for development of public-use facilities, or where the existing use is adverse to the proposed plans for the management of the area, these historical uses may reasonably be allowed to continue until (a) such time as there is a desire on the part of the owners to dispose of their holdings; or (b) until it is proposed that the present compatible uses of these lands be altered or changed so significantly as to make them incompatible with the primary purpose for which the area was established. Accordingly, in the acquisition of the properties devoted to such compatible uses, the National Park Service shall observe the following procedure:

1. The Service will not seek to acquire private lands without the consent of the owner, so long as the lands continue to be devoted to present uses now being made of them—such as for modest homesites, ranches, limited eating establishments, or lodges. This also applies to any future owners of the property so long as the properties continue to be devoted to present uses.

2. The National Park Service will welcome offers from the owners to sell private properties to the United States, and it is hoped that the owners will give the Service first opportunity to purchase them. If an owner wishes to sell his property outright, the Service would be glad to negotiate on that basis; or in the alternative, on such other basis as may be authorized in the applicable legislation relating to the retention of use and occupancy rights by the owner for a given number of years or for the remainder of his life and that of his spouse. The latter situation will enable people who desire to obtain money in hand today for their property, with occupancy rights for a term of years or for their lifetime, to work out a negotiated contract on this basis.

3. If existing incompatible uses persist or if present compatible uses of properties are to be changed and the properties are to be devoted to new and different uses not compatible with the primary purpose for which the area was established, the Service will attempt to negotiate with the owner for the acquisition of the property in order to eliminate a use, or avoid development of a use, adverse to the management of the area. In the event all reasonable efforts at negotiation fail and the owner persists in his efforts to devote the property to a use deemed by the Service to be adverse to the primary purpose for which the area was established, the United States will institute eminent domain proceedings to acquire the property and eliminate such use or prevent such development.
4. All negotiations by the Federal Government shall be on the basis of competent appraisals of fair market value.

Water Rights

All rights to the use of water diverted to or used on Federal lands in historical areas by the United States, its concessioners, lessees, or permittees shall be perfected in the name of the United States.

Valid existing water rights of concessioners and land-use permittees on Federal lands will be acquired by the United States as funds, legal authority, and overall management objectives permit.

Water rights owned by private landowners within historical areas will be acquired in connection with the acquisition of such private lands insofar as practicable.

Owners of land or interests in land within or adjacent to historical areas may be granted, by special-use permit, the privilege of using water owned by the Service when it is administratively determined that the use of such water facilitates the management program of the Service. An appropriate charge shall be made for the use of such water.

Owners of land or interests in land adjacent to the historical areas may be granted, by special-use permit, the privilege of developing sources of water on Federal lands when it is administratively determined that the use of such water facilitates the management program of the Service. An appropriate charge shall be made for the use of such water.

Development costs, including costs of access between the private lands to be served and the source of water, shall be borne by the permittee. In all of these cases, the Service shall retain the right to use water from such a development. If and when such retained rights are exercised by the Service, it shall share in the costs of the water-rights development on an equitable basis.

Under this policy, as a matter of comity, the Service will notify the States of the amount of water diverted and consumed, and the priority asserted. The notice shall also include a disclaimer as to State jurisdiction.

Fire and Fire Control

Any fire within a historical area that poses any threat to the historical resources or facilities of the area or any resources or facilities outside the area will be controlled and extinguished.

Any fire within a historical area other than one employed in the management of vegetation and/or wildlife habitat of the area will be controlled and extinguished.

The use of natural fire or prescribed burning may be employed in the management of vegetation and/or wildlife habitat consistent with approved resource management plans.

The Service will cooperate in programs to control or extinguish any fire originating on lands adjacent to a historical area and posing a threat to the historical or natural resources or physical facilities of the area. (See also Fire Detec-
tion and Suppression, p. 29, Historic Preservation Policy section; and Health and Safety, p. 60, Resource and Visitor-use Policy section.)

**Soil and Moisture Conservation**
Programs will be conducted for the prevention and correction of erosion and soil or vegetation deterioration.

A historical area may participate in the program of a Grasslands Conservation District or Soil Conservation District when the purposes, plans, programs, and operation of the District are consistent with the purpose of the historical area and the policies for its management and use. (See also Historic Districts, p. 31, Historic Preservation Policy section.)

**Air Pollution**
The Service will work with others within the regional air shed to reduce air pollution from sources within the area and elsewhere in the air shed. Fumes and smoke from campfires, refuse burning, and other kinds of combustion will be controlled in public-use areas to the extent necessary to maintain clean air.

**Solid-waste Disposal**
Wastes generated within a historical area may be disposed of within or outside the area so long as disposal does not (1) pollute water or air, (2) result in the defacement of public recreation areas, or (3) result in destruction or impairment of important natural or cultural resources.

**Aircraft Operation**
Where aircraft operations adversely affect the environment of a historical area, the cooperation of agencies exerting flight control over aircraft will be sought to institute such measures as will minimize or eliminate the disturbance.

The use of aircraft in historical areas is permissible in emergency situations involving the saving of human life or protection of threatened park resources, or when the use of aircraft offers significant advantages to area management and such can be accomplished with minimum disturbance to visitor enjoyment.

**Forest Management**
Forests that contribute to the preservation of historical integrity of the area will be managed to resemble as nearly as possible the condition that prevailed at the time or period being commemorated.

Forests unrelated to the preservation of historical integrity of the area will be managed in accordance with the best sylvicultural principles to achieve the objectives for these forests as stated in the approved natural resource management plan. (See also Natural Resources Management, p. 38, this section.)

**Water Pollution Abatement and Control**
The Service will strive to maintain quality of all waters (1) originating within the boundaries of historical areas through

(a) provision of adequate sewage treatment and disposal for all public-use facilities, including self-contained boat sewage storage units;
control of erosion;
(c) regulation and control, as necessary, of fuel-burning water craft;
(d) avoidance of contamination by lethal substances, such as certain insecticides;
(e) regulation of the intensity of use in certain areas and at certain times when determined as being necessary based on water-quality monitoring;

and (2) flowing through or bounding on historical areas
(a) by applying the methods listed under 1(a) to (e) above; and
(b) consistent with the purpose of the historical area and the policies for its management and use by entering into cooperative agreements or compacts with other agencies and governing bodies for cooperative measures to avoid water pollution. (See also Recreation Advisory Council Policy Circular No. 3 of April 9, 1964, Appendix C, and Soil and Moisture Conservation, p. 42, this section.)

Mineral Exploration, Mineral Leasing, and Mining
Except where authorized by law, when carried on pursuant to valid existing rights, or as part of an interpretive program, mineral prospecting, mining, and the extraction of minerals or the removal of soil, sand, gravel, and rock shall not be permitted. (See also Natural Resources Management, p. 38, this section, and Construction Materials, p. 72, Physical Developments Policy section.)

Forest Insect and Disease Control
The basic objective of insect and disease control in forests or in shade, ornamental, or specimen trees is to preserve, maintain, or restore the historical integrity of the area. A concerted effort will be made to prolong the life of any historically significant tree, grove, woodland, or forest extant at or representative of the time of the event commemorated. Control operations may be initiated (1) at any time against any insect or disease posing a threat to the integrity of the area, particularly Class VI sites; (2) when the outbreak poses a threat to trees or forests outside the area; (3) to maintain shade and ornamental trees in developed areas (Class I and II sites); (4) to preserve or maintain rare or scientifically valuable specimens or communities (Class IV sites); (5) to control outbreaks on Class III and V lands to maintain infestations and infections at endemic levels; and (6) in cooperation with other Federal or State agencies when park lands are included within a larger control unit.

No insect or disease control activities may be undertaken in wilderness areas unless approved by the Director. The measure of control will depend on a determination of whether the insects or diseases are causing the complete alteration of an environment which is expected to be preserved. However, controls will generally be limited to disaster conditions that threaten whole ecosystems. Any controls instituted will be those that will be most direct for the target or disease and which will have minimal effect on other components of the ecosystems of which the wilderness is composed.
Disposal of Natural Resources
Natural resource products accumulated as the result of site clearing, vista clearing, resource management activities, or resulting from natural phenomena such as storms and floods, and which cannot be economically or feasibly recycled through the ecosystem, or which pose a potential threat to other natural resources, may be salvaged and disposed of in accordance with Federal laws and procedures.
In connection with fishing and hunting on lands administered by certain bureaus of the Department (including the National Park Service), the Secretary of the Interior, on September 10, 1970, issued the following regulations:

The Secretary of the Interior recognizes that fish and wildlife resources must be maintained for their aesthetic, scientific, recreation, and economic importance to the people of the United States, and that because fish and wildlife populations are totally dependent upon their habitat, the several States and the Federal Government must work in harmony for the common objective of developing and utilizing these resources. It is the policy of the Secretary of the Interior further to strengthen and support, to the maximum extent possible, the missions of the States and the Department of the Interior in the attainment of this objective.

The effective husbandry of such resources requires the cooperation of State and Federal governments because:

(a) The several States have the authority to control and regulate the capturing, taking, and possession of fish and resident wildlife by the public within State boundaries;

(b) The Congress, through the Secretary of the Interior, has authorized and directed to various Interior agencies certain responsibilities for the conservation and development of fish and wildlife resources and their habitat.
Accordingly, the following procedures will apply to all areas administered by the Secretary of the Interior through the National Park Service, Bureau of Sport Fisheries and Wildlife, Bureau of Land Management, and Bureau of Reclamation (hereinafter referred to as the Federal agencies). These Federal agencies will:

1. Within their statutory authority, institute fish and wildlife habitat management practices in cooperation with the States which will assist the States in accomplishing their respective, comprehensive, statewide resource plans;

2. Permit public hunting, fishing, and trapping within statutory limitations and in a manner compatible with the primary objectives for which the lands are administered. Such hunting, fishing, and trapping and the possession and disposition of fish, game, and fur animals shall be conducted in all other respects within the framework of applicable State laws, including requirements for the possession of appropriate State licenses or permits. The Federal agencies may, after consultation with the States, close all or any portion of land under their jurisdiction to public hunting, fishing, or trapping in order to protect the public safety, to prevent damage to Federal lands or resources thereon, and may impose such other restrictions as are necessary to comply with management objectives;

3. Consult with the States and comply with State permit requirements in connection with the activities listed below, except in instances where the Secretary of the Interior determines that such compliance would prevent him from carrying out his statutory responsibilities:
   (a) In carrying out research programs involving the capturing, taking, or possession of fish and wildlife or programs involving introduction of fish and wildlife;
   (b) For the planned and orderly removal of surplus or harmful populations of fish and wildlife except where emergency situations requiring immediate action make such consultation and compliance with State permit requirements infeasible;
   (c) In the disposition of fish and wildlife taken under (a) or (b) as provided above.

4. Exempted from this regulation are the following:
   (a) The control and regulation by the United States, in the area in which an international convention or treaty applies, of the taking of those species and families of fish and wildlife expressly named or otherwise covered under any international treaty or convention to which the United States is a party;
   (b) Any species of fish and wildlife control over which has been ceded or granted to the United States by any State;
   (c) Areas over which the States have ceded exclusive jurisdiction to the United States.

5. Nothing contained herein shall be construed as permitting public hunting, fishing, or trapping on national parks, monuments or historic areas of the National Parks System, except where Congress or the Sec-
retary of the Interior has otherwise declared that hunting, fishing, or trapping is permissible.

6. The Federal agencies and States will enter into written cooperative agreements containing the plans, terms, and conditions of each party in carrying out the intent of this regulation when such agreements are desired by the States. Such agreements will be reviewed periodically by both parties and, when appropriate, adjusted to reflect changed conditions.

ADMINISTRATIVE POLICIES

Fishing
Sport fishing is encouraged in historical areas when consistent with the restoration and perpetuation of aquatic environments and aquatic life native in the area during the historical period commemorated at the area. Commercial fishing is permitted only when specifically authorized by law.

Where fishing is permitted, such fishing shall be carried out in accordance with applicable State laws and regulations, unless exclusive legislative jurisdiction* has been ceded within the area, and a State license or permit shall be required for such fishing unless otherwise provided by law.

Public Hunting
Public hunting shall not be permitted in historical areas.

Wildlife Populations
Wildlife populations will be controlled when necessary to maintain the health of the species, the native environment and scenic-historic landscape and to safeguard public health and safety. Ungulate populations will be maintained at the level that the range will carry in good health and without impairment to the soil, the vegetation, or to habitants of the several species in an area.

Wildlife Management Program
Insofar as possible, control through natural predation will be encouraged.

Public hunting outside of the area is recognized as the next most desirable means of controlling wildlife populations. Cooperative studies and management plans with States and other Federal agencies are to be continued to facilitate

* The term "exclusive legislative jurisdiction" is applicable to situations wherein the Federal Government has received, by whatever method, all the authority of the State, with no reservation made to the State except the right to serve process resulting from activities which occurred off the land involved. This term is applied notwithstanding that the State may exercise certain authority over the land, as may other States over land similarly situated, in consonance with the several Federal statutes. The term is also sometimes referred to as "partial jurisdiction."
public hunting outside of the areas, especially through extended special seasons established by the States.

Other control measures, as necessary, shall be undertaken as follows:

(1) Live-trapping in the areas for transplanting elsewhere; (2) research specimens for National Park Service and cooperating scientists; and (3) direct reduction by National Park Service personnel. It is recognized that it may be necessary, on occasion, to carry on each phase of this program simultaneously. The National Park Service will adjust the use of these control methods (except natural predation) to meet varying weather and other relevant conditions, giving highest priority to the opportunities for public hunting outside the areas and live-trapping in the areas for transplanting elsewhere. (See also Natural Resources Management, p. 38, Resource Management Policy section; and Cooperation with States, this page.)

Exotic Plants and Animals
Exotic plants and animals may be introduced into historical areas as part of various management programs for purposes of public use and enjoyment except that no species, particularly those new to the country or region, may be introduced unless there are reasonable assurances from the U.S. Department of Agriculture, the Bureau of Sport Fisheries and Wildlife of the U.S. Department of the Interior, and responsible State agencies that the species will not become a pest or disrupt desirable natural plant and animal communities and associations of particular scenic or historic significance. (See also Natural Resources Management p. 38, Resource Management Policy section.)

Cooperation with States
The Service will consult with the appropriate State fish and game departments in carrying out programs of control of over-abundant or otherwise harmful populations of fish and wildlife or research programs involving the taking of such fish and resident wildlife, including the disposition of carcasses therefrom. In any case where there is a disagreement, such disagreement shall be referred to the Secretary of the Interior who shall provide for a thorough discussion of the problems with representatives of the State fish and game department and the National Park Service for the purpose of resolving the disagreement.
NATURAL RESOURCE MANAGEMENT

POLICIES

NATURAL AREAS

1970
part I

RESOURCE MANAGEMENT POLICY

DISCUSSION

The preservation of natural areas is a fundamental requirement for their continued use and enjoyment as unimpaired natural areas. Park management, therefore, looks first to the care and management of the natural resources of a park. The concept of preservation of a total environment, as compared with the protection of an individual feature or species, is a distinguishing feature of national park management.

In earlier times, the establishment of a park and the protection of its forests and wildlife from careless disturbance were sufficient to insure its preservation as a natural area. The impact of man on the natural scene was negligible since the parks were surrounded by vast undeveloped lands, and there were comparatively few visitors. This condition prevails no more, for the parks are fast becoming islands of primitive America, increasingly influenced by resource use practices around their borders, and by the impact of increasing millions of visitors.

Passive protection is not enough. Active management of the natural environment, plus a sensitive application of discipline in park planning, use, and development, are requirements for today.

The resource management task thus embraces:

1. Safeguarding forests, wildlife, and natural features against impairment or destruction.
2. The application of ecological management techniques to neutralize the unnatural influences of man, thus permitting the natural environment to be maintained essentially by nature.

3. Master planning for the appropriate allocation of lands to various purposes in a park, and in the character and location of use areas as needed for developments.

**ADMINISTRATIVE POLICIES**

**Plant and Animal Resources**

Natural areas shall be managed so as to conserve, perpetuate, and portray as a composite whole the indigenous aquatic and terrestrial fauna and flora and the scenic landscape.

Management will minimize, give direction to, or control those changes in the native environment and scenic landscape resulting from human influences on natural processes of ecological succession. Missing native life forms may be reestablished, where practicable. Native environmental complexes will be restored, protected, and maintained, where practicable, at levels determined through historical and ecological research of plant-animal relationships. Non-native species may not be introduced into natural areas. Where they have become established or threaten invasion of a natural area, an appropriate management plan should be developed to control them, where feasible.

Commercial harvesting of timber is not permitted except where the cutting of timber "is required in order to control the attacks of insects or diseases or otherwise to conserve the scenery or the natural or historic objects" in a natural area, such as in the case of severe "blow-downs." (See also Landscape Management, p. 19, this section; Fishing, p. 25, Fish and Wildlife Management Policy section; Disposal of Resources, p. 44, Resource Use Policy section; and Non-native Plants and Animals, p. 56, and Timber Harvesting, p. 58, Wilderness Use and Management Policy section.)

**Fire**

The presence or absence of natural fire within a given habitat is recognized as one of the ecological factors contributing to the perpetuation of plants and animals native to that habitat.

Fires in vegetation resulting from natural causes are recognized as natural phenomena and may be allowed to run their course when such burning can be contained within predetermined fire management units and when such burning will contribute to the accomplishment of approved vegetation and/or wildlife management objectives.

Prescribed burning to achieve approved vegetation and/or wildlife management objectives may be employed as a substitute for natural fire.
**Fire Control**

Any fire threatening cultural resources or physical facilities of a natural area or any fire burning within a natural area and posing a threat to any resources or physical facilities outside that area will be controlled and extinguished.

The Service will cooperate in programs to control or extinguish any fire originating on lands adjacent to a natural area posing a threat to natural or cultural resources or physical facilities of that area.

Any fire in a natural area other than one employed in the management of vegetation and/or wildlife of that area will be controlled and extinguished. (See *Fire Control*, p. 56, *Wilderness Use and Management Policy* section.)

**Grazing**

Domestic livestock grazing competes with native wildlife and impedes the effort in natural areas to achieve an ecological balance. Accordingly, grazing of domestic livestock in natural areas is permitted only where it is sanctioned by law, is incidental to visitor use, or is desirable to preserve and interpret significant historical resources of the area. Where grazing has been permitted and its continuation is not specifically covered by the aforesaid conditions, it should be eliminated through orderly and cooperative procedures with the individuals concerned. Support of Service or concessioner pack-and-saddle stock by the use of forage in a natural area shall be limited to locations where dry feeding is clearly impractical. (See also *Agricultural Uses*, this page; *Land Classification*, p. 32, *Master Plan Policy* section; and *Grazing*, p. 58, *Wilderness Use and Management Policy* section.)

**Agricultural Uses**

Agricultural uses, including domestic livestock raising, may be permitted in natural areas only where they are desirable to perpetuate and interpret significant historical resources, are permitted by law, or are required pursuant to acquisition agreements or similar documents. (See also *Grazing*, this page).

**Solid-waste Disposal**

Refuse generated from operations within a natural area shall be disposed of by approved methods outside the area, where practicable and feasible. Refuse disposal within the area, where necessary, shall be accomplished by incineration or sanitary landfill, or through modification of these methods, as appropriate.

**Off-road Use of Motorized Equipment**

Public use of motor vehicles shall be confined to designated park roads or other designated overland routes exclusive of foot trails and bridle trails. Public use of portable power equipment, such as generators and powersaws,
may be permitted in specifically designated areas. (See also Rescue and Other Emergency Operations, p. 56, and Motorized Equipment, p. 58, Wilderness Use and Management Policy section.)

The off-road use of motorized equipment for official purposes shall be carefully planned and controlled to meet the requirements of area management with due regard for the protection of human life and park resources. (See also Motorized Equipment, p. 58, Wilderness Use and Management Policy section.)

Cultural Resources

Where significant cultural resources are present in a natural area and are worthy of preservation for their historical value, they shall be protected and presented for public understanding, appreciation, and enjoyment to the extent compatible with the primary purpose of the area. In such cases, the management and use of the cultural resources will be patterned after the management and use of similar resources in historical areas.

Soil and Moisture Conservation

Programs will be conducted for the prevention and correction of erosion and soil or vegetation deterioration resulting from unnatural causes.

A natural area may participate in the program of a Grasslands Conservation District or Soil Conservation District when the purposes, plans, programs, and operation of the District are consistent with the purposes of the natural area and the policies for its management and use. (See also Plant and Animal Resources, p. 17, this section; Landscape Management, this page; Water Development Projects, p. 58, Wilderness Use and Management Policy section; and Nonpark Uses and Development, p. 62, Physical Developments Policy section.)

Quality of Environment

To achieve the purpose of a natural area, i.e., preservation and appropriate public use, planning and management should be related to the total environment in which the area is located. (See also Master Plan Policy section, p. 31.) Such planning and management recognize the need for transportation arteries; utility and communication corridors; consumptive resource uses; and residential, commercial, and recreation land uses in the environs of the park as parts of a systematic plan assuring viability and good health of the park and the surrounding region.

The Service should be alert to peripheral use and development proposals that impinge on the environment of a natural area. Moreover, it should cooperate with, and encourage joint and regional planning among, public agencies, organizations, and individuals having responsibility for maintaining the quality and esthetics of the environment surrounding natural areas.

Landscape Management

When consistent with and not materially disruptive of the maintenance of
natural ecological associations of the area, landscape management will be practiced to erase, ameliorate, or conceal the scars and visual impact of structures, facilities, and construction activities related thereto which impinge on the natural scene. (See also Congressional Policies, p. 12; Plant and Animal Resources, p. 17, this section; Architectural Theme, p. 60, and Concession Facilities, p. 61, Physical Developments Policy section; and Road and Trail Policy section, p. 63.)

**Water Pollution Abatement and Control**

The Service will strive to maintain quality of all waters (1) originating within the boundaries of natural areas through

(a) provision of adequate sewage treatment and disposal for all public-use facilities, including self-contained boat sewage storage units;
(b) control of erosion;
(c) regulation and control, as necessary, of fuel-burning water craft;
(d) avoidance of contamination by lethal substances, such as certain insecticides;
(e) regulation of the intensity of use in certain areas and at certain times when determined as being necessary based on water quality monitoring;

and (2) flowing through or bounding on natural areas

(a) by applying the methods listed under 1(a) to (e) above;
(b) consistent with the purposes of the natural area and the policies for its management and use by entering into cooperative agreements or compacts with other agencies and governing bodies for cooperative measures to avoid water pollution. (See also Recreation Advisory Council Policy Circular No. 3 of April 9, 1964, Appendix G, and Soil and Moisture Conservation, p. 19, this section.)

**Air Pollution**

The Service will work with others within the regional air shed to reduce air pollution from sources within the area and elsewhere in the air shed. Fumes and smoke from campfires, refuse burning, and other kinds of combustion will be controlled in public-use areas to the extent necessary to maintain clean air.

**Mineral Exploration, Mineral Leasing, and Mining**

Except where authorized by law or when carried on pursuant to valid existing rights or as part of an interpretive program, mineral prospecting, mining, and the extraction of minerals or the removal of soil, sand, gravel, and rock will not be permitted. (See also Mining and Prospecting, p. 57, Wilderness Use and Management Policy section.)

**Forest Insect and Disease Control**

Native forest insects and diseases existing under natural conditions are natural
elements of the ecosystem. Accordingly, populations of native insects and the incidence of native diseases will be allowed to function unimpeded, except when control is required (1) to prevent the loss of the host from the ecosystem; (2) to prevent the complete alteration of an environment which is expected to be preserved; (3) to prevent outbreaks of the insect or disease from spreading to forests or trees outside the area; (4) to preserve rare, scientifically valuable, or specimen trees, or unique forest communities; (5) to maintain a suitable overstory, shade, or ornamental trees of Class I and II lands; and (6) to preserve trees significant to the maintenance of historical integrity of Class VI sites.

Where non-native insects or diseases have become established or threaten to invade a natural area, appropriate measures will be taken to control or eradicate them where feasible.

No insect or disease control activities may be undertaken in wilderness areas without the approval of the Director.

Any controls instituted will be those which will be most direct for the target insect or disease and which will have minimal effect upon other components of the ecosystem.

**Physical Resources**

To the extent possible, the physical natural resources in a natural area shall be maintained in a natural state for their inherent educational, scientific, and inspirational values, and as a medium for supporting the diversity and the continuation of life processes.
DISCUSSION

In the Yellowstone National Park legislation of 1872, the Congress charged the Secretary of the Interior to "* * * provide against the wanton destruction of the fish and game found within said park, and against their capture or destruction for the purposes of merchandise or profit."

The act of May 7, 1894 (28 Stat. 73), amending the original Yellowstone legislation, provides, in part, as follows:

Sec. 4 That all hunting, or the killing, wounding, or capturing at any time of any bird or wild animal except dangerous animals, when it is necessary to prevent them from destroying human life or inflicting an injury, is prohibited within the limits of said park; nor shall any fish be taken out of the waters of the park * * * in any other way than by hook and line, and then only at such seasons and in such times and manner as may be directed by the Secretary of the Interior. That the Secretary of the Interior shall make and publish such rules and regulations as he may deem necessary and proper for the management and care of the park and for the protection of the property therein, * * * and for the protection of the animals and birds in the park from capture or destruction, or to prevent their being frightened or driven from the park; and he shall make rules and regulations governing the taking of fish from the streams or lakes in the park * * *.

Congressional policies similar to those enunciated in the 1894 act were prescribed for many of the other national parks as they were established.

Provisions of Article III of the Convention on Nature Protection and Wild-
life Preservation in the Western Hemisphere Between the United States of America and Other American Republics likewise "* * * prohibit hunting, killing and capturing of members of the fauna and destruction or collection of representatives of the flora in national parks except by or under the direction or control of the park authorities, or for duly authorized scientific investigations." (See also Treaty Series 981, Appendix C.)

In the 1950 Grand Teton National Park legislation, the Congress reaffirmed its traditional policy relating to recreational public hunting in the national parks. The Congress did provide, however, that in the elk management program for the park the Secretary of the Interior should engage Wyoming State licensed hunters deputized as park rangers in the controlled reduction of elk when in the proper management and protection of the elk it was found to be necessary to carry out a program of direct reduction. Thus, recreational public hunting has not been approved by the Congress as an appropriate park visitor use in the natural area category of the System.

On the other hand, sport fishing has been an approved park visitor use in such areas since the establishment of Yellowstone National Park.

In implementing these laws, the National Park Service at the outset concentrated on a program of wildlife protection, which in that era was certainly the most obvious need in wildlife conservation, i.e., protecting the wildlife populations from public hunting and protecting their habitat from wildfire. Experience over several decades of park management has demonstrated, however, that protection, though it is important, is not in itself a substitute for adequate habitat.

In 1962, the Secretary appointed an Advisory Board to study and make recommendations on the Wildlife Management Policy in the National Parks. The Advisory Board consisted of Dr. A. Starker Leopold, Chairman (University of California), Dr. Stanley A. Cain (University of Michigan), Dr. Ira N. Gabrielson (President, Wildlife Management Institute), Dr. Clarence M. Cottam (Chairman, National Parks Association), and Thomas L. Kimball (Executive Director, National Wildlife Federation). (See Appendix D for full text of report.)

The Secretary, on May 2, 1963, approved the recommendations of the Advisory Board on Wildlife Management in the National Parks and directed that they be incorporated in the administrative policies of the Service.

Also, the Secretary, on June 17, 1968, issued a policy statement applicable to public lands administered by certain Bureaus of the Department (including the National Park Service), as follows:

A. In all areas administered by the Secretary of the Interior through the National Park Service, the Bureau of Sport Fisheries and Wildlife, the Bureau of Land Management, and the Bureau of Reclamation, except the National Parks, the National Monuments, and historic areas of the National Park System, the Secretary shall—

1. Provide that public hunting of resident wildlife and fishing shall be permitted within statutory limitations in a manner that is compatible
with and not in conflict with, the primary objectives as declared by the Congress for which such areas are reserved or acquired;

2. Provide that public hunting, fishing, and possession of fish and resident wildlife shall be in accordance with applicable State laws and regulations, unless the Secretary finds, after consultation with appropriate State fish and game departments, that he must close such areas to such hunting and fishing or restrict public access thereto for such purposes;

3. Provide that a State license or permit, as provided by State law, shall be required for the public hunting, fishing, and possession of fish and resident wildlife on such areas;

4. Provide for consultation with the appropriate State fish and game department in the development of cooperative management plans for limiting over-abundant or harmful populations of fish and resident wildlife thereon, including the disposition of the carcasses thereof, and, except in emergency situations, secure the State's concurrence in such plans; and

5. Provide for consultation with the appropriate State fish and game department in carrying out research programs involving the taking of fish and resident wildlife, including the disposition of the carcasses thereof, and secure the State's concurrence in such programs.

B. In the case of the National Parks, National Monuments, and historic areas of the National Park System, the Secretary shall—

1. Provide, where public fishing is permitted, that such fishing shall be carried out in accordance with applicable State laws and regulations, unless exclusive legislative jurisdiction* has been ceded for such area, and a State license or permit shall be required for such fishing, unless otherwise provided by law;

2. Prohibit public hunting; and

3. Provide for consultation with the appropriate State fish and game departments in carrying out programs of control of over-abundant or otherwise harmful populations of fish and resident wildlife or research programs involving the taking of such fish and resident wildlife, including the disposition of carcasses therefrom.

In any case where there is a disagreement, such disagreement shall be referred to the Secretary of the Interior who shall provide for a thorough discussion of the problems with representatives of the State fish and game departments and the National Park Service for the purpose of resolving the disagreement.

* The term "exclusive legislative jurisdiction" is applicable to situations wherein the Federal Government has received, by whatever method, all the authority of the State, with no reservation made to the State except the right to serve process resulting from activities which occurred off the land involved. This term is applied notwithstanding that the State may exercise certain authority over the land, as may other States over land similarly situated, in consonance with the several Federal statutes. The term is also sometimes referred to as "partial jurisdiction."
ADMINISTRATIVE POLICIES

Fishing
Sport fishing is encouraged in natural areas when consistent with the restoration and perpetuation of the natural aquatic environments and the natural aquatic life. Commercial fishing is permitted only when specifically authorized by law.

Where fishing is permitted, such fishing shall be carried out in accordance with applicable State laws and regulations, unless exclusive jurisdiction, as that term is defined in the Secretary's policy statement of June 17, 1968, has been ceded within the area, and a State license or permit shall be required for such fishing unless otherwise provided by law. (See also Fishing, p. 57, Wilderness Use and Management Policy section.)

Public Hunting
Public hunting shall not be permitted in natural areas. (See also Hunting, p. 58, Wilderness Use and Management Policy section.)

Wildlife Populations
Wildlife populations will be controlled when necessary to maintain the health of the species, the native environment, and the scenic landscape, and to safeguard public health and safety. Ungulate populations will be maintained at the level that the range will carry in good health and without impairment to the soil, the vegetation, or to habitats of the several species in an area.

Wildlife Management Program
Insofar as possible, control through natural predation will be encouraged. Public hunting outside of the area is recognized as the next most desirable means of controlling wildlife populations. Cooperative studies and management plans with States and other Federal agencies are to be continued to facilitate public hunting outside of the areas, especially through extended special seasons established by the States for public hunting outside the areas.

Other control measures, as necessary, shall be undertaken as follows: (1) Live-trapping in the areas for transplanting elsewhere; (2) research specimens for National Park Service and cooperating scientists; and (3) direct reduction by National Park Service personnel. It is recognized that it may be necessary, on occasion, to carry on each phase of this program simultaneously. The National Park Service will adjust the use of these control methods (except natural predation) to meet varying weather and other relevant conditions, giving highest priority to the opportunities for public hunting outside the areas and live-trapping in the areas for transplanting elsewhere. (See also Plant and Animal Resources, p. 17, Resource Management Policy section; Public Hunting, this page, and Cooperation with States, p. 26, this section; Regulation of Excess Wildlife Population, p. 56, Wilderness Use and Management Policy section; and Appendix E.)
Cooperation with States

The Service will consult with the appropriate State fish and game departments in carrying out programs of control of over-abundant or otherwise harmful populations of fish and wildlife or research programs involving the taking of such fish and resident wildlife, including the disposition of carcasses therefrom. In any case where there is a disagreement, such disagreement shall be referred to the Secretary of the Interior, who shall provide for a thorough discussion of the problems with representatives of the State fish and game department and the National Park Service for the purpose of resolving the disagreement.
Explicit in the several congressional enactments is that national parks are established for the "benefit and enjoyment of the people" of this and future generations. The mission of a national park is achieved as it provides enjoyment, refreshment, and knowledge. Implicit in these legislative mandates is the concept that use of a park and its resources is to be of a special kind and quality.

Accordingly, it is clear that park forests, waters, wildlife, and minerals are not available for consumptive, exploitative use as a material resource. The features of a park are to be preserved "from injury or spoliation * * * for the benefit and enjoyment of the people" of this and future generations.

"Benefit and enjoyment" connote more than recreation. The use of national parks for the advancement of scientific knowledge is also explicit in basic legislation. National parks, preserved as natural, comparatively self-contained ecosystems, have immense and increasing value to civilization as laboratories for serious basic research. Few areas remain in the world today where the process of nature may be studied in a comparatively pure natural situation. Such use of national parks and monuments is to be encouraged to the degree that, in the process, the natural integrity is not itself impaired.
Fishing

(See Fishing, p. 25, Fish and Wildlife Management Policy section.)

Research

The public use, protection, development, interpretation, and management of the natural and cultural resources of a natural area shall be predicated on documented data obtained through appropriate investigation and research. Moreover, the use of the resources in natural areas for study or research purposes by recognized educational and scientific institutions and accredited individuals shall be encouraged. Pursuant to the achievement of these policies, the collection of reasonable numbers of biological and geological specimens and historic artifacts and objects may be permitted.

All research should be in consonance with the purposes of the park and the policies of the Service. Procedures which might result in damage or alteration to Class IV areas will not be permitted. Care should be taken to avoid excessive disturbance or destruction of plantlife, as well as excessive disturbance or harassment of wildlife and aquatic life. In no case will harassment of rare and endangered species be permitted, and undue disturbance thereof must be avoided. (See also Research Program, p. 37, Research Station Policy section; Preservation and Display of Natural and Cultural Objects and Disposal of Resources, this page; and Research, p. 56, Wilderness Use and Management Policy section.)

Preservation and Display of Natural and Cultural Objects

Objects representative of the natural and cultural resources of natural areas may be collected and preserved for study and interpretive purposes. Where objects are not obtainable from the area or additional objects are needed to supplement existing collections, such may be acquired by gift, loan, exchange, purchase, etc., in conformance with legal authorization and existing procedures.

Disposal of Resources

Natural products salvaged as a result of resource management activities and physical development projects that are excess to the management needs of a natural area shall be disposed of in accordance with Federal laws and procedures. Also, natural products salvaged from natural phenomena which adversely affect, or impair, the management of a natural area and which are excess to the management needs of the area, shall be disposed of in accordance with Federal laws and procedures. (See also Act of August 25, 1916, 16 U.S.C. 3; and Plant and Animal Resources, p. 17, Resource Management Policy section.)
Archeological and historic objects and artifacts shall not be disposed of or removed from the jurisdiction of the Service except in connection with approved educational or research programs. Arrangements for their transfer, loan, or other disposal shall be made in accordance with Federal laws and established procedures. (See also Sale of Native Handicraft and Artifacts, p. 51, Visitor Use Policy section; and Act of June 8, 1906, 16 U.S.C. 431.)

Aircraft Operations
Where aircraft operations adversely affect the environment of a natural area, the cooperation of agencies exerting flight control over public aircraft will be sought to institute such measures as will minimize or eliminate the disturbance. The use of aircraft in natural areas is permissible in emergency situations involving the saving of human life or protection of threatened park resources, or when the use of aircraft offers significant advantages to area management and such can be accomplished with minimum disturbance to visitor enjoyment. Float-equipped or amphibious aircraft may land in designated water-oriented parks to provide visitor access to selected areas. Landings will be restricted to waters especially designated on the park Master Plan for this use. (See also Fire Control and Rescue and Other Emergency Operations, p. 56, and Motorized Equipment, p. 58, Wilderness Use and Management Policy section; and Airports, p. 60, Physical Developments Policy section.)

Berry Picking
Individuals may gather berries, fruits, mushrooms, and similar edibles for consumption in the area, but not for sale or distribution to others.

Official Records
In conformance with legal authorization and existing procedures, the Service shall make available, upon request, those official records affecting the public. (See also Part 2 of Title 43. Code of Federal Regulations, issued pursuant to the Public Information Act of June 5, 1967 (P.L. 90-23).)
NATURAL RESOURCE MANAGEMENT

POLICIES

1978
CHAPTER IV

NATURAL RESOURCE MANAGEMENT

Management Policies of the National Park Service
United States Department of the Interior

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Natural Resource Management

THE NATIONAL PARK SERVICE WILL MANAGE THE NATURAL RESOURCES OF THE NATIONAL PARK SYSTEM TO MAINTAIN AND PERPETUATE THEIR INHERENT INTEGRITY.

National Park Service planning provides for zoning of all park lands in one or all of four land classifications: natural, historic, park development and special use. Each zone in turn may have various subzones. Use and resource management within these zones and subzones are guided by the management policies and carried out through the planning process. Policies valid for any particular zone or subzone shall be the same for any unit of the System except where legal requirements or valid existing rights require exceptions.

Management of park lands possessing significant natural features and values is concerned with ecological processes and impact of people upon these processes and resources. The concept of perpetuation of a total natural environment or ecosystem, as compared with the protection of individual features or species, is a distinguishing aspect of the Service's management of natural lands.

Natural resources—vegetation, animal life, and water and geological features—occur in most areas of the System. The vegetation may be native plants surviving naturally in an isolated section of a large park. It may also be a formal garden laid out and cared for based upon the historic criteria of the period represented. The maintenance of the historic scene and of the integrity of cultural resources is a primary objective in historic zones.

Park development zones are managed and maintained for intensive visitor use. It is understood that roads, walks, buildings, and other visitor and management facilities may occupy much of the area, and that the natural aspect of the land will accordingly be altered. Historic features will be generally absent in park development zones. Management of the park development zone will aim at maintaining a natural environment if possible, given the use of the zone. Such management may be accomplished through the manipulation of the natural environment or by conformance with the approved historical or cultural theme in historical parks. Any manipulation will be the minimum necessary to achieve the planned use. For example, native vegetation should not be extensively replaced by exotic species for solely aesthetic reasons.

Legislation establishing some parks may permit various resource uses, such as grazing, mining and hunting, which are generally not allowed in the National Park System. In some parks, legislation and policies may also provide considerable latitude for active
management of certain resources. Even in such areas, resource management must seek to avoid unnecessary alteration of the natural scene or interference with natural processes.

In all parks it is necessary for the Service to consciously plan for and carry out the management for the priceless heritage entrusted to its care in the manner best designed to perpetuate that heritage now and in the future. Historic scenes may change due to natural processes. Certain ecological processes altered by human activities may need to be abetted to maintain the closest approximation of the natural scene where a truly natural system is no longer attainable. Prescribed burning in the Everglades sawgrass is an example. The effects of use on the natural resources of all areas must be monitored in order to take appropriate action to assure resource perpetuation.

The dynamic nature of plant and animal population, and human influences upon them requires that they be monitored to detect any significant changes. Action will be taken in the case of changes based upon the type and extent of change and the appropriate management policy.

Natural resources specialists will work closely with historians, visitor use specialists, planners and managers to assure that resource management is consistent with each park's purpose and objectives and Service policy.

(See Management Zoning II-3.)

SCIENCE PROGRAM

Natural and social science information is necessary for management of the National Park System. The National Park Service will, therefore, conduct a program of natural and social science, to support management in carrying out the mission of the Service and provide accurate scientific data upon which all aspects of planning, development, and management of the units of the System may be based.

The Service also may permit the use of parks by qualified investigators for scientific studies when such use shall be consistent with Service policies and contribute to the attainment of park objectives.

(See Information Base II-1, Research Involving Cultural Resources V-6 , Research and Collection Permits VII-20.)
NATURAL RESOURCES MANAGEMENT PLAN

This plan defines the course of action, based on Service policy and law, for the continuous protection, management, and maintenance to perpetuate the resources, to achieve park purpose and objectives, and to appropriately regulate the effect of park use on these resources.

The plan defines the operating program related to all the natural resources and the science program necessary to address crucial aspects or refinements of those operations. In the absence of adequate knowledge, operational programs will be aimed at maintaining the status quo and avoidance of long term or possibly irreversible impacts until priority research can provide necessary information for management changes.

(See The General Management Plan II-2, The Historic Scene V-24, Wilderness Management VI-6, Backcountry Use VII-10, Regulation of Special Uses VII-14.)

RESOURCE UTILIZATION

As a general policy, the Service does not allow consumptive utilization of renewable or non-renewable park resources. However, the diversity of parks within the System, the occurrence of rights and privileges relating to resource uses continuing from prior to the establishment of certain parks, specific provisions of legislation, and management needs require exceptions and modifications for the management of the System. Where consumptive uses are permitted by law, and where it can be demonstrated that they are detrimental to the purpose of a park, the Service will recommend their elimination, limitation, curtailment, or modification through the legislative process.

In units of the System where specified by law, the Secretary of the Interior may utilize such statutory authority otherwise available to him or her for the conservation and management of natural resources where it furthers, is compatible with, or is not detrimental to the area's purpose.

(See Research and Collecting Permits VII-20, Collecting Without Permit VII-21)

DISPOSAL OF TREES AND OTHER NATURAL RESOURCES

Natural resource products accumulated as the result of approved development, vista clearing, and other resource management activities must be salvaged or disposed of in accordance with Service instructions and applicable laws or procedures. Residue resulting from
natural phenomena such as storms and floods will be recycled through the ecosystem, if feasible, but when it poses a threat to human safety or resources, it will be handled in accordance with the same procedures described above.

(See Landscape and Vegetative Manipulation IV-19.)

FIREWOOD

Aesthetically pleasing and energy conserving wood fires may be allowed in designated sites. Foraging for firewood may be prohibited in all or part of parks where such activity is adversely impacting the natural or historic scene. Wood salvaged by the Service as a result of conditions described in the preceding section may be supplied for campfires at the discretion of the Superintendent.

Concessioners may sell wood for campfires in park areas if campfire use is consistent with park regulations. Such wood must be obtained from outside the park or purchased from the Service when available under conditions described in the preceding section, "Disposal of Trees and Other Natural Resources."

AGRICULTURAL USES

Natural Zones - Agricultural uses are not permitted in natural zones on parks.

Historic Zones - In historic zones, agricultural activities, including demonstration farms, are permitted where they conform to those that occurred during the historic period and where they do not detract from the principal interpretive purposes.

Agricultural uses that do not conform to those in practice during the historic period are permitted where they contribute to the maintenance of a historic scene, are permitted by law, or are required pursuant to acquisition agreements or similar documents.

Agricultural Subzone - Agricultural practices may be permitted to achieve desirable land uses, in accordance with the area's theme and objectives. Leases or special permits may be issued for the management by others of such agricultural and wildlife enhancement land.

Employee and Community Gardens - Service and concessioner employees living in the parks may cultivate gardens in park development zones and historic zones for personal use, under terms set by the Superintendent, where such use does not deplete or pollute available water supplies, impinge on the visitor's enjoyment of the historic or natural scene, or adversely affect important park resources. In metropolitan parks such as National Capital Parks, community gardens
for recreational gardening may be designated when it has been determined that no significant historic or natural resources are adversely affected, and where such use does not pollute or deplete available water supplies. Pesticide use will be in accordance with established Service regulations and guidelines.

(See Pesticide Use IV-13.)

GRAZING

Commercial grazing is not permitted in any park where such use is detrimental to the primary purpose for which it was established. Grazing on park land is permitted where authorized by law or permitted for a term of years as a condition of land acquisition.

Grazing and raising of livestock is also permitted in historic zones where desirable to perpetuate and interpret the historic scene.

(See Special Use Zone II-4.)

Control and Regulation of Commercial Grazing - Where the Service has direct control over regulation of grazing, it will require that livestock numbers or trail stock use be kept at a level, and distributed spatially and seasonally, to keep them within the carrying capacity of the area being grazed, and to assure that the needs of wildlife in the same area will be met. Where conduct of grazing occurs through others, such as the Bureau of Land Management, the Service will consult and cooperate to achieve the same goal.

Grazing of Trail Stock - Trail stock (horses, mules, and burros) used by the Service, concessioners, or private parties may graze in natural zones of the parks only incidental to passage through these areas. Such grazing may be curtailed in these areas wherever necessary to restore full use by native wildlife and natural fire regimens. When conditions warrant, Superintendents may publish regulations closing portions of a park to stock or establishing the times and places within natural zones when food for trail stock must be carried by the trail party. Where Service and concessioner trail stock must be quartered in parks, they must be limited to designated areas away from significant park features.

(See Grazing and Stock Driveways VI-3.)

Commercial Grazing Fees - Fees will be charged on an annual basis and will conform to fees set by the Bureau of Land Management, the Forest Service or private land owners, whichever applies to the area involved.
Elimination of Grazing - Where grazing is permitted and its continuation is not in the best interest of public use or maintenance of the park ecosystem, it will be eliminated, wherever possible, through orderly and cooperative procedures with the individuals concerned.

MINERAL EXPLORATION, LEASING, AND MINING

Mineral exploration, leasing, and mining are not permitted except where expressly authorized by law, except that the Secretary of the Interior has authority for the utilization of resources in certain units of the National Park System. Such utilization is authorized when it will promote, or is compatible with and does not significantly impair, public recreation and the conservation of scenic, scientific, historic, or other values contributing to public enjoyment. Administrative authorization shall be contingent upon compliance with the Procedures for the Protection of Historic and Cultural Properties promulgated by the Advisory Council on Historic Preservation. The National Park Service will strive to control mineral leasing, and eliminate mining activities that are inimical to the purpose of any unit of the National Park System.

(See Special Use Zone II-4, Wilderness—Mining and Prospecting VI-4.)


MANAGEMENT OF ANIMAL POPULATIONS

The Service will perpetuate the native animal life of the parks for their essential role in the natural ecosystems. Such management, conformable with general and specific provisions of law and consistent with the following provisions, will strive to maintain the natural abundance, behavior, diversity, and ecological integrity of native animals in natural portions of parks as part of the park ecosystem.

Native species are those that occur, or occurred due to natural processes on those lands designated as the park. These do not include species that have moved into those areas, directly or indirectly as the result of human activities.

Native animal life in the National Park System shall be given protection against harvest, removal, destruction, harassment, or harm through human action, except where:
- hunting and trapping are permitted by law;
- fishing is permitted by law for either sport or commercial use or is not specifically prohibited;
- control of specific populations of wildlife is required for the maintenance of a healthy park ecosystem; or
- removal or control of animals is necessary for human safety and health.

Natural processes shall be relied upon to regulate populations of native species to the greatest extent possible. Unnatural concentrations of native species, caused by human activities, may be regulated if those activities causing the concentrations cannot be controlled. Non-native species shall not be allowed to displace native species if this displacement can be prevented by management. The need for, and results of, regulating animal populations, either native or non-native, shall be documented and evaluated by research studies.

(See Wildlife Observation VII-7.)

HUNTING

Hunting, trapping, or other methods of harvest of native wildlife, is not permitted by the public in natural and historic zones, except where specifically permitted by law. Where specifically authorized by Congress, public hunting shall be in accordance with applicable State and Federal laws and regulations. However, the Service may designate zones where, and establish periods when, no hunting shall be permitted for reasons of public safety, administration, or other public use and enjoyment of the area. Under the above provision, the Service, in consultation with States, may ban hunting in part or all of a park for any or all legally huntble game or non-game species for reasons of their:

- being officially designated as endangered, threatened, or locally of rare or unusual occurrence in the park;
- occurring in numbers below the natural capacity of their range; or
- being of greater overall value for wildlife viewing and interpretation.

Regulations prescribing such restrictions shall be issued after consultation with the States.
FISHING

Fishing has been traditionally permitted in the National Park System since the establishment of Yellowstone. The Service will continue this practice, but, in so doing, it affirms that:

- Waters may be closed to fishing to protect rare, threatened, or endangered plant and animal species in the waters on in adjacent habitat.

- Portions of park waters may be closed to fishing when the fish life and other aquatic life has greater value to greater numbers of visitors for the appreciation of plant and animal life, for scientific study, interpretation, or environmental education.

- Fishing may be prohibited in certain waters and at certain times when necessary to protect spawning grounds of endemic fish species or to maintain natural distributions of densities of native wildlife species that use fish for food.

- Fishing may be permitted in historic zones when it does not intrude adversely on the historic scene or harm cultural resources.

Where fishing is permitted, such fishing shall be carried out in accordance with applicable State and Federal laws and regulations. Park regulations may be different for native and non-native species and may be modified for specified waters. Commercial fishing is permitted only where authorized by law.

Natural Zones - Fisheries management shall be:

- specifically aimed towards preservation or restoration of the full spectrum of native species, including fish; and

- regulated for native species so that mortality is compensated by natural reproduction.

No artificial stocking of exotic fish species will occur; artificial stocking of fish may be employed only to reestablish native species. Areas that are added to the National Park System that have had an artificial stocking program shall phase it out. Waters naturally barren of fish will not be stocked with either native or exotic fish species but will be allowed to remain in, or revert to, their natural state.
Special Use Zones - Reservoirs, occurring in a number of areas, represent altered natural environments which may reduce populations of some native species of fish and encourage others. New ecological environments and niches are created which may be most successfully filled by exotic fish species; however, native species will be given precedence over exotic species wherever they are adaptable to the altered environment. Rivers and streams may be stocked with exotic species of fish when it has been determined that exotic species are already present and established and where scientific data indicate the introduction of exotics would not seriously diminish native species populations. Accordingly, the Service, in cooperation with State fish and game officials, may work out programs of fish stocking of reservoirs and other waters for purposes of recreational fishing, using either exotic or native species, or both. Active fishery management programs are encouraged in such waters.

WILDLIFE AND FISH MANAGEMENT IN SPECIFIED AREAS

In areas set aside with legal requirements for wildlife and fish management, the Service will still perpetuate native animal life and protect the integrity of natural ecosystems. Management will be directed towards maintaining populations of fish and wildlife for aesthetic, ecological, recreational, educational or scientific value. In those areas where recreational hunting, trapping, and fishing programs are authorized by law and consistent with park objectives, management programs may be directed toward the maintenance and enhancement of habitat for game animals (including fish, amphibians, mammals, birds, mollusks, and crustaceans). The management of fish and wildlife in these areas must be a cooperative endeavor with the States. These cooperative endeavors will be effected through a Memorandum of Understanding with the respective State.

REGULATION OF WILDLIFE POPULATIONS

Regulation of native animal populations in natural zones shall be permitted to occur by natural means to the greatest extent possible. In parks where hunting is not authorized by law, public hunting on land outside of the park is recognized as a means of controlling wildlife populations that move in and out of park boundaries. Cooperative studies and management plans with States and other Federal agencies will be initiated or continued to facilitate desirable public hunting outside of park boundaries, especially through extended or special seasons established by the States.

Other control measures to be used as necessary may include (1) live trapping in the areas for transplanting elsewhere; (2) providing research specimens for National Park Service and cooperating
scientists; and (3) direct reduction by Service personnel. It is recognized that it may be necessary, on occasion, to carry on various phases of this program simultaneously. The Service will adjust the use of these control measures to meet varying weather and other relevant conditions, giving highest priority to the opportunities for public hunting outside the parks and live trapping within parks for transplanting purposes.

The Service will control wildlife populations or individual animals when necessary for visitor safety and health. Where persistent control problems exist, the Service must determine whether or not curtailment or modification of visitor use and other human activities might not be a desirable alternative. Control may include trapping and transplanting or, only when necessary, destruction of offending animals.

DISPOSAL OF SURPLUS WILDLIFE AND CARCASSES

Where the Service removes animals from the parks, consistent with Service policy, the animals or their carcasses shall be disposed of in accordance with applicable agreements, laws, and regulations. Generally, first priority for disposal of ungulates, both live and as carcasses, is with the various Indian tribes in furtherance of their programs.

Cooperation with States - The Service will consult with the appropriate State fish and game departments in carrying out programs of control of populations of fish and wildlife, or research programs involving the taking of such fish and resident wildlife, including the disposition of carcasses. The Service will refer any resultant disagreements to the Secretary of the Interior, who shall provide for a thorough discussion of the problems with representatives of the affected State fish and game department and the Service for the purpose of resolving the disagreement.

REINTRODUCTION OF NATIVE PLANTS AND ANIMALS

The reintroduction of native species into parks is encouraged, provided that:

- adequate habitat exists in the park and on adjacent public lands and waters to support the species;

- the species, based on an effective management plan, does not pose a serious threat to the safety of park visitors or park resources, or to persons or property outside of park boundaries;
- the species being reintroduced most nearly approximates the extirpated subspecies or race;

- the species disappeared, or was substantially diminished, because of human-induced changed—either directly or indirectly—to the ecosystem; and

- confinement of the animals by fencing will be permitted only until the animals become thoroughly accustomed to the new area or they have become established sufficiently that threats from predators, poaching, disease, or other factors have been minimized.

Such programs will be carried out in cooperation with other affected parties and agencies.

THREATENED AND ENDANGERED PLANTS AND ANIMALS

The Service will identify all threatened and endangered species within park boundaries and their critical habitat requirements. As necessary, the Service shall control visitor use and access to such habitat, including closure to entry for other than official purposes. Active management programs, where necessary, may be carried out to perpetuate the natural distribution and abundance of threatened or endangered species and the ecosystem on which they depend, in accordance with existing Federal laws.

The Service will cooperate with the Fish and Wildlife Service, which is recognized as the lead agency in matters pertaining to threatened or endangered species, including delineation of critical habitat on parklands.

Plant and animal species considered to be rare or unique to a park shall be identified also and their distribution within the park mapped. Management actions for their protection and perpetuation shall be incorporated into the natural resources management plan.


(See Natural Resources Management Plan IV-3, Research and Collecting Permits VII-20.)

EXOTIC PLANTS AND ANIMALS

Definitions - Exotic species are species that occur in a given place, area, or region as the result of direct or indirect, deliberate or accidental introduction of the species by humans. For example, species that humans deliberately have introduced into, and established in, the
wild in North America for use as free-roaming game animals on private and non-park public lands clearly are exotic species on National Park System lands that have been set aside for preservation of examples of the natural or historic features characteristic of the United States. Such exotic species are not natural components of the ecological systems characteristic of the given location, and as a result, have not evolved in concert with the evolution of those species that are native to the location. The native species are species which presently occur, or once did occur prior to some human influence, in a given place, area, or region as the result of ecological processes that operate and have operated without significant direct or indirect, deliberate or accidental alteration by humans. For the purposes of this section, direct or indirect, deliberate or accidental introductions by humans are ones that have permitted species to cross natural barriers to their dispersal capabilities thus giving those species opportunities to become established in areas previously inaccessible to them because of natural forces. For example, the stocking of a fish-free portion of a river above a waterfall with fish taken from a portion of the same river below the waterfall is a human act that permits a species to cross a natural barrier to dispersal and thus is an act of deliberate introduction of an exotic species.

Introduction of New Exotic Species - Decisions on whether to introduce to a park species that are not native to the park will be controlled by the purposes and designated zones of the park. In natural zones, non-native plant and animal species may not be introduced except in rare cases where they are the nearest living relatives of extirpated native species or where they may be used to control established exotic species. In historic zones, non-native plant and animal species may be introduced in rare cases similar to those identified for natural zones. In addition, non-native species that are a desirable part of the domestic historic scene being represented in an historic zone may be introduced, but only if they are controlled and maintained by recognized domestic techniques, such as cultivation, tethering, herding, or pasturing. In park development and special use zones, non-native species of plants and animals may be introduced to carry out programs consistent with park objectives only when it can be shown: 1) that the most appropriate native species are extinct, 2) that other native species will not meet the needs of the management program, 3) that, based on scientific advice from appropriate Federal, State, local, and non-governmental sources, each species proposed for introduction will not become a pest, and 4) that such introductions will not spread and disrupt desirable adjacent natural plant and animal communities and associations, particularly those of natural zones.

Reference: Executive Order 11987, Exotic Organisms, May 24, 1977
Control of Exotic Species Already Present in a Park - Manipulation of population numbers of exotic plant and animal species, up to and including total eradication, will be undertaken whenever such species threaten protection or interpretation of resources being preserved in the park. Examples of threatening situations include: 1) being detrimental to public health, 2) disrupting the faithful presentation of the historic scene, 3) damaging historic and archeological resources, 4) threatening the perpetuation of natural features, native species (including especially those that are endangered, threatened, or otherwise unique), natural ecological communities, or natural ecological processes, and 5) significantly hampering the management of adjacent park or non-park lands. Control programs will most likely be taken against exotic species which have a high impact on protected park resources and where the program has a reasonable chance for successful control; programs are least likely to be initiated against exotic species which have almost no impact on park resources and where there is a minimal probability for successful control. The decision to initiate a control program will be based on existing and newly acquired, scientifically valid resource information that identifies the exotic status of the species, demonstrates its impact on park resources, and indicates alternative control methods and their probabilities of success. Development of a control plan and implementation of actions to protect the park resources will be done according to established planning procedures and will include provisions for public review and comment. Care will be taken that programs to control exotic species do not result in significant damage to native species, natural ecological communities, natural ecological processes, or historic objects.

INSECT AND DISEASE CONTROL

Native insects and diseases existing under natural conditions are natural elements of the ecosystem. Accordingly, populations of native insects and the incidence of native diseases will be allowed to function unimpeded except where control is required (1) to prevent the loss of the host or host-dependent species from the ecosystem; (2) to prevent outbreaks of the insect or disease from spreading to forests, trees, other vegetative communities, or animal populations outside the area; (3) to conserve threatened or endangered, or unique plant specimens or communities; (4) to conserve and protect flora and fauna in developed zones; or (5) for reasons of public health and safety.

The basic objective of insect and disease control in historic zones is to preserve, maintain, or restore the historical integrity of the area. A concerted effort will be made to prolong the life of any
historically significant tree, grove, woodland, forest, or other plant community extant at or representative of the time of the event commemorated. The occurrence of normal endemic populations may be typical of historic, pesticide-free times.

Control operations may be initiated (1) to protect the integrity of the historic scene and (2) to prevent outbreaks from spreading to uninfested forests or trees outside the area.

The measure of control in wilderness areas will be the minimum necessary to prevent escape from the wilderness environment.

PESTICIDE USE

Chemical pesticides of any type will be used only where feasible alternatives are not available or acceptable. The Service's use of all pesticides shall be approved by the Director. Application shall be in accordance with applicable laws, Departmental and Service guidelines, and Environmental Protection Agency and Occupational Health and Safety Administration regulations.

(See Water IV-17.)

FIRE MANAGEMENT

Fire is a powerful phenomenon with the potential to drastically alter the vegetative cover of any park.

The presence or absence of natural fires within a given ecosystem is recognized as a potent factor stimulating, retarding or eliminating various components of the ecosystem. Most natural fires are lightning-caused and are recognized as natural phenomena which must be permitted to continue to influence the ecosystem if truly natural systems are to be perpetuated.

The fire management program of all parks must be designed around park objectives. In natural systems this may include the need for some areas to proceed through succession toward climax while others are set back by fire. Natural zones should represent the full spectrum of the parks' dynamic natural vegetative patterns. Sharply defined zones or blocks of vegetation limited to certain species locked in over time are not natural and only rarely justified. In historic zones fires may be controlled or used to perpetuate the historic scene.

(See Wilderness--Fire Management VI- 8.)
MANAGEMENT FIRES

Management fires, including both prescribed natural fires and prescribed burns, are those fires which contribute to the attainment of the management objectives of a park through execution of predetermined prescriptions defined in detail in the Fire Management Plan, a portion of the approved Natural Resources Management Plan.

Prescribed natural fire is the preferred means to achieve the prescriptions in natural zones. This use of natural ignition may be adopted when analysis of past fire occurrence, distribution, control, and influence, indicates that natural vegetative accumulation and composition has not been significantly altered by past management of fire control. It may also be used where the prescription provides for a transition from an altered state back to historic fuel loading.

In ecosystems modified by prolonged exclusion to fire, prescribed burning may be used to restore fuel loading or vegetative composition to natural levels followed by a prescribed natural fire program, or to create narrow fuel breaks along boundaries of a fire management area and thereby reduce the probability of wildfires crossing into or out of that area.

Prescribed burning may be used as a substitute for prescribed natural fire in natural zones only where the latter cannot meet park objectives. This determination will be documented in the Fire Management Plan. In natural zones, the objective for prescribed burning is to simulate, to the fullest extent, the influence of natural fire on the ecosystem. In other zones it may be used to recreate or perpetuate a historic setting or to attain other resources management objectives.

Clearly defined limits will be established in the prescription of all management fires, beyond which limited or complete control action will be undertaken.

Management fires in the park will be suppressed if they threaten:

- human life;
- cultural resources or physical facilities of the park;
- threatened or endangered species;
- to escape from predetermined zones or from the park, except where cooperative agreements provide for certain fires to cross such boundaries; or
- to exceed the prescription.
WILDFIRE PREVENTION AND CONTROL

All fires not classed as management fires are "wildfires" and will be suppressed.

An active fire prevention program will be conducted in all parks and in conjunction with other agencies to protect human life, prevent modification of park ecosystems by human-caused wildfire, and prevent damage to cultural resources or physical facilities.

Human-caused fires will be controlled to prevent damage and to eliminate impact to the park ecosystems.

The fire suppression methods used in the parks should be those causing the least resource damage, commensurate with effective control.

Cooperative agreements will be developed to facilitate reciprocal fire management activities for land within and adjacent to the parks.

WATER RESOURCES

The waters of a park are a primary resource on par with the wildlife, forest, and geological and historic features, and emphasis should be placed on conservation of water to allow for increased visitation without the need for additional water development. Therefore, the park shall make only those water developments which are absolutely necessary for the visiting public and the operation of the park. Conservation and protection of the water resource are of primary concern to management. Park waters, surface or ground, may be withdrawn for consumptive use so long as such withdrawal is necessary for the use and management of the park and does not significantly alter natural processes and ecosystems. A continuous vigilance will be maintained by observing and monitoring upstream diversions and ground water withdrawals as to their effect on the occurrence, quantity, and quality of water necessary for the continued preservation of the park ecosystem it supports.

Whenever possible, ground water sources should be developed in lieu of, or for replacement of, surface water diversion in parks as being less susceptible for pollution and requiring less maintenance.

All such water shall be adequately treated so that its return to water courses meets or exceeds applicable State and Federal water quality standards. Irrigation in order to maintain exotic ecosystems or plantings shall be avoided, except where such irrigation is part of an approved management program essential to achieve park objectives, and dependable supplies are available. Wherever possible, park developments will secure water from municipalities or regional suppliers outside the park.
Before new water systems or extensions of existing systems are constructed, it must be determined that reasonable economies in the use of existing water systems will not cover anticipated needs. No new waste treatment plant should be constructed nor should existing plants be enlarged because of increased sewage flow until it has been determined that reductions in water use are not possible.

*(See Pollution Control and Abatement IV-17.)*

**WATER RIGHTS**

Water necessary for the development, use, and management of the National Park System will be obtained and used in accordance with the "reserved right" principle where applicable. The "reserved right" principle is applicable on lands withdrawn or reserved from the public domain for authorized purposes without ever having been in territorial or State ownership. The right to use of water to accomplish authorized purposes is also reserved. In cases where that principle is applicable, the proper State agency may be notified, as a matter of comity, of current and foreseeable future water requirements in a manner to be developed with each State. Where the principle is not applicable, water rights will be obtained in accordance with State laws.

Comity notifications and water rights filings shall include a disclaimer as to State jurisdiction, i.e., "Nothing herein shall constitute a waiver of any other right which the United States may have to the same water."

All rights to the use of water diverted to or used on Federal lands in areas of the National Park System by the United States, its concessioners, leasees, or permittees shall be perfected in the name of the United States.

Valid existing water rights of concessioners and land-use permittees on Federal lands will be acquired by the United States as funds, legal authority, and overall management objectives permit.

Water rights owned by inholders within parks will be acquired in connection with the acquisition of such private lands when practicable. Conveyance deeds should cite the quantity of water purchased with the property, and appropriate decree and permit numbers. Similarly, private water rights within parks, attached to impoundments where no land is involved, will be acquired as practicable.

Owners of land or interests in land within or adjacent to parks, under the National Park Service General Authorities Act of 1970 (P.L. 91-838, 84 Stat. 825), may be granted, by special-use permit,
the privilege of developing and using water or sources of water owned by the Service only when it is administratively determined that the use of such water facilitates the management programs of the Service. Such permits will not be issued if any other reasonable source of water supply is available. An application docket containing a draft of the special use permit, background material, and recommendations must be sent to Washington for submission to appropriate congressional committees for review and concurrence prior to consummating any binding commitments. Development costs, including cost of access between the private lands to be served and the source of water, shall be borne by the permittee. In all cases, the Service shall retain the right to use water from such a development. If and when such retained rights are exercised by the Service, it shall share in the cost of the water rights development on an equitable basis.

Owner of lands or interests in lands within or adjacent to Congressionally designated recreation areas may be granted, by special-use permit, the privilege of installing, at no cost to the Government, pipelines or other means to transport water across Federal lands administered by the Service when the water rights are either owned by the permittees or another agency of the Government. An appropriate charge for such rights-of-way shall be made.

(See Inholdings IX-2.)

POLLUTION CONTROL AND ABATEMENT

The Service will adhere to all applicable provisions of Executive Order 11752 for the prevention, control, and abatement of environmental pollution at Federal facilities. The Service will also adhere to all other applicable Federal, State, and local laws regarding avoidance, amelioration, or elimination of environmental pollution, and will cooperate with the Environmental Protection Agency to this end.

WATER

The Service and its agents will, consistent with applicable Federal, State, and local laws and regulations, maintain the quality of all waters:

1. originating within the boundaries of parks through
   a. provisions of adequate sewage treatment and disposal for all public-use and administrative facilities, including the requirement for self-contained boat sewage storage units;
b. control of erosion induced by human activities;

c. prevention of direct pollution by livestock through elimination of streamside or lakeside corrals or pastures, or direct watering sites on natural waters;

d. regulation and control, as necessary, of fuel-burning water craft;

e. avoidance of contamination by toxic substance, such as certain pesticides, herbicides, and heavy metals;

f. regulation of the intensity of use in certain areas and at certain times when determined as being necessary based on water quality monitoring; and

2. flowing through or bounding on park areas

a. by applying the methods listed under 1(a), above, for any water use within the park; and

b. by entering into cooperative agreements or compacts with other agencies and governing bodies for cooperative measures to avoid water pollution.

Whenever possible, park sewage and water systems will be connected to outside systems.

(See Pesticide Use IV-13, Water Resources IV-15.)

AIR

The quality of the air in the parks plays a vital role in both visitor enjoyment and perpetuation of historic or natural resources. Efforts will be made to control, mitigate or eliminate adverse alteration of the air quality of the parks by industrial/mechanical sources.

Management of in-park pollutant sources and of influences on the parks from outside sources will require close coordination with regional air shed authorities and adjacent agencies. Pollution from transportation, heating, and power generation sources need particular attention. The Service will comply with the Clean Air Act Amendments of 1970, as amended (P.L. 91-604, Dec. 31, 1970; P.L. 95-95, Aug. 7, 1977; 42 USC 7401 et.seq.), directives and other pertinent regulations.

(See Fire Management IV-13, Formal Campgrounds III-8.)

SOLID WASTE

Proper disposal of all solid waste generated in a park area is the responsibility of the area manager, whether such disposal occurs
inside the Federal reservation or outside. All disposal will be in compliance with guidelines promulgated in the Solid Waste Disposal Act, which apply to waste generated by visitors, concessioners, contractors, park staff, and all other park users. In addition, any park area which issues any license or permit for disposal of solid waste on Federal property shall, before issuance of such license or permit, consult with the Environmental Protection Agency to insure compliance with guidelines contained in this Act.

The Service shall promote the use of biodegradable materials and the reuse and recycling of materials to the degree possible. Waste disposal sites outside of the park will be chosen whenever practical, but if this is impossible, in-park sites for disposal by sanitary landfill shall be carefully selected. Incineration as a means of solid waste disposal shall be used only if there is no other feasible alternative and shall be in compliance with applicable laws and regulations.

(See Comfort Stations III-10, Wilderness—Refuse Disposal VI-6, Backcountry Sanitation VII-12.)

NOISE

Activities causing excessive or unnecessary noise in and adjacent to parks will be monitored and action taken to avoid or minimize noise which detracts from the visitor's enjoyment of park values, unduly disturbs the peace of adjacent neighborhoods, or adversely affects park resources. Maximum noise limits tolerated will, at least, be consistent with OSHA regulations and applicable State and local laws and regulations.

(See Design and Construction Considerations III-5.)

LANDSCAPE AND VEGETATIVE MANIPULATION

Within the four primary management zones that may occur in parks, programs of landscape and vegetative manipulation have differing purposes and are carried out to achieve approved uses.

Examples are Turkey Run Farm in Washington, D.C., and the pastoral area at Point Reyes National Seashore. Management may include but is not limited to:

- encouragement of certain species of plants for aesthetic or wildlife and vegetative management purposes;

- maintenance of certain plant associations for approved livestock or agricultural uses;

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- increasing the ability of certain areas to absorb recreational use through vegetative management; and

- retention of provision of open areas, meadows, vistas.

(See Management Zoning II-3, Disposal of Trees and Other Natural Resources IV-3, Exotic Plants and Animals IV-11, Fire Management IV-13, Inventory of Cultural Resources V-4, Proposal Formulation Affecting Cultural Resources V-11, Pesticide Use IV-13.)

NATURAL ZONES

Manipulation of terrain and vegetative cover may be carried out to restore natural conditions on lands altered by human activity through, but not restricted to the following:

- removal of man-made features, restoration of natural gradients, and revegetation with native park species on acquired inholdings and sites from which park development is to be removed;

- restoration, to a natural appearance, of areas disturbed by fire control activities; and

- minor or infrequent rehabilitation of limited visitor impacted areas. Regular activities such as vista clearings should be limited to defined Landscape Management Area Subzones.

Conditions caused by natural phenomena such as landslides, earthquakes, floods, and natural fires will be modified as little as possible commensurate with public safety and the reconstruction—if necessary and desirable—of public use facilities in the affected area.

HISTORIC ZONES

Trees, other vegetation, and other natural features in a historic zone shall be managed to reflect the historic scene which prevailed during the historic period.

Every effort shall be made to extend the lives of specimen trees dating from the historic period. An individual tree of historical value posing a safety hazard, and diseased beyond recover, shall be removed and replaced. Provisions should be made, while unique trees or shrubs are healthy, for their eventual replacement by progeny through sprout, seed or cuttings.

(See Exotic Plants and Animals IV-11, Insect and Disease Control IV-12, The Historic Scene V-24.)
SPECIAL USE ZONES

Primary authority over these lands rests with entities other than the National Park Service. The management of the national resources of these zones will be directed (to the maximum extent possible) toward achievement of the defined objectives of the park. Vegetative manipulation may be used to achieve these objectives.

(See Exotic Plants and Animals IV-11.)

PARK DEVELOPMENT ZONES

Management of landscape and vegetation in developed areas shall be commensurate to the greatest extent possible with the purpose of a given park. The landscape and vegetation should be managed to affect the transition between park developments and the terrain, biota, and physical appearance of surrounding management zones commensurate with the requirements and impacts of visitor use.

Rehabilitation and maintenance is expected on areas impacted by visitor use including, if necessary, the redesign, relocation, removal—or the provision—of facilities to avoid or ameliorate adverse visitor impacts on the ecosystem.

(See Construction III-6, Design Quality and Control III-5. Employee and Community Gardens IV-4, Exotic Plants and Animals IV-11.)

WEATHER MODIFICATION

Weather modification projects affecting parks generally are in conflict with the congressional mandate to perpetuate the integrity of the park environment. Therefore, the National Park Service is opposed to modification proposals unless it can be conclusively demonstrated that weather modification will not influence the natural or historic environments of National Park System areas.

(See Hydrometeorologic Devices VI-6.)

CAVE MANAGEMENT

The National Park Service will manage caves for the perpetuation of their natural, geological and ecological conditions, and historic associations.

Developments such as artificial entrances, enlargement of natural entrances, pathways, lighting, interpretive devices, ventilation
systems and excavation of elevator shafts are permissible only where necessary for general public use when such development will not significantly alter any conditions perpetuating the natural cave environment or harm historic resources. General public access by tours of suitable duration and interest will be limited to a representative sample of a cave.

No development above or adjacent to caves will be undertaken which would significantly alter natural cave conditions including subsurface water movements.

Caves, or portions of caves, may be closed to public use or restricted to access by conducted tours when such actions are required for human safety and the protection of cave resources. Caves, or portions of caves, may be managed exclusively for research and access limited to approved research personnel.

SHORELINE PROCESSES

In natural zones, shoreline processes—erosion, deposition, dune formation, inlet formation, etc.—will be allowed to take place naturally, except where control measures, required by law or Service commitment, are necessary to protect life and property in neighboring areas.

In historic zones, control measures, if necessary, will be predicated on thorough studies taking into account the nature and velocity of the shoreline processes, the threat to the cultural resource, the significance of the cultural resources, and alternatives, including costs, for protecting the cultural resource. Such studies must also determine if and how control measures would impair resources and processes in natural zones, in order that management may make an informed decision on the course of action to be followed.

In development zones, management should plan to phase out, systematically relocate, or provide alternative developments to facilities located in hazardous areas that cannot be reasonably protected. New developments will not be placed in areas subject to flood or wave erosion or active shoreline processes unless it can be demonstrated that they are essential to meet the park's purpose, that no alternative locations are available, and that the development will be reasonably assured of surviving during its planned lifespan without the need of shoreline control measures. Before development in such areas is provided, the requirements of Executive Order 11968, "Floodplain Management" must be fulfilled.
Where erosion control is required by law, or where present developments must be protected to achieve park management objectives, the Service will employ the most natural appearing and effective method feasible.

Most shoreline areas of the National Park System are part of larger physiographic systems, and the processes of these larger systems directly affect the management of those NPS areas contained therein. Therefore, the Service shall seek to obtain the assistance of appropriate Federal, State and local agencies in carrying out the management objectives of NPS shoreline areas.

The Service will cooperate with State and other Federal entities to develop strategies for maintaining existing transportation and utility links on barrier islands in the event of storm damage or inlet formation. Where these links are interrupted by inlet formation, the Service will recommend, within the limits of practicality, reestablishment in a manner that allows the unimpeded operation of inlet formation and closures.

Where navigation channels are established in NPS waters, the Service will work with the responsible agency to see that necessary dredging is carefully controlled and that dredged material is disposed of in such a manner as to have the least adverse impact on the aquatic ecosystem and to optimize the value of spoil deposit as wildlife habitat.

(See Cooperation for Preservation I-9, Cooperative Regional Planning II-5.)
VITA

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President's Park, National Capital Region
National Park Service
1978 - 1979

Park Technician (Law Enforcement)
Antietam National Battlefield
National Capital Region
National Park Service
1979 - 1981

Park Technician (General)
Wolf Trap Farm Park
National Capital Region
National Park Service
1981 - 1982
Park Ranger (Natural Resource Management)
Antietam National Battlefield
National Capital Region
National Park Service
1982

Professional Organizations:

Society of American Foresters
(former member)
National Recreation and Park Association
(former member)
Association of Interpretive Naturalists
(former member)
Western Interpreters Association
(former member)
Interpretation Canada
(former member)
Forest History Society
(former member)
National Association for Search and Rescue
Association of National Park Rangers