

AN
ABBREVIATED
HISTORY
of
NATURAL RESOURCES MANAGEMENT
with the
NATIONAL PARK SERVICE

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INTRODUCTION

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.

Examination of the activities of the first civilian superintendents of Yellowstone, of the U.S. Cavalry in the National Parks, and, finally, of the National Park Service itself, up until the late 1960s and early 1970s, reveals a pattern of vacillation in philosophies related to natural resources management. This resulted in wavering policies and management actions related to the resources within the National Parks.

A general trend of improved resource management developed within the National Park Service during the early 1970s. Although the Service was more actively involved in natural resources management and scientific research during this decade, than ever before, the ability of the Service to protect park resources had actually reached something of 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 the general socio-industrial expansion of the nation.

Between 1980 and 1988 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) long-term 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. Following is a brief account of this evolution.

RUDIMENTS OF RESOURCES MANAGEMENT AND THE EARLY NATIONAL PARK MOVEMENT

The Stage is Set

Between 1872 and 1915 the national parks were subjected to a whole host of threats including poaching of wildlife, theft of geologic and botanical features, trespass grazing, vandalism, 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. 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. In addition, San Francisco needed a water supply and the Hetch Hetchy Valley of Yosemite National Park was looked to as a potential reservoir site. The Hetch Hetchy Valley became a major concern during the 1890s and early 1900s. 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. Some aspects of this understanding and philosophy would persist for many years, but, they would eventually give way to ecologically sound management strategies.

The first 43 years of national park movement were shaky at times. Even so, 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 emerged as a resource concern, with significant stocking efforts being undertaken. Forest fires were fought, and the American Bison was saved from possible extinction. In addition to setting this groundwork, perhaps the most significant contribution of this time, was the germination of the idea that parks are something more than natural anomalies. (80) This concept is particularly important because many of the early parks were established to protect natural curiosities.

The first tentative steps toward ecosystem management had been taken and the time was ripe for the work of Stephen Mather.

THE CREATION OF THE NATIONAL PARK SERVICE

The Organic Act

Stephen T. 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 and on a major publicity program to promote the parks (80). 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, 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 ... by such means and measures as

conform to the fundamental purpose ..., 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 primary purpose for which such park, monument, or reservation was created, except that this provision shall not apply to the Yellowstone National Park. (40)

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. This was far from the truth. This legislation specifically allowed grazing, predator control, forest insect and disease control, and timber removal to enhance visitor use and scenic values. Not only was the agency left with the dilemma of resource protection versus visitor use, but resource use under certain circumstances was condoned.

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. (16) 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, Mather's trusted assistant, 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. Pressure was particularly

sever for allowance of grazing and, in fact, some acreage was opened to this activity. (22,155)

The First Resource Management Staff and Forest Protection

Stephen Mather moved quickly in the organization of the Service. Military control of the parks was ended, and a Washington Office began to emerge. Horace Albright was sent to Yellowstone in 1919 and Arno Cammerer was hired as the Assistant Director (88,160). Mather believed that the Service could best function if the individual parks were allowed to operate with a minimal amount of influence from Washington. Thus the Service's headquarters staff was kept small. (96)

One of the three original divisions established in the Washington Office was that of landscape engineering (architecture) (23). 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.... (96)

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. However, in 1926, several devastating fires occurred in a number of the national parks. This stimulated Mather to designate Ansel Hall, of the Educational Division, as the Service's Chief Forester, and, in 1927, a separate Division of Forestry was established. (6,41) The new Forestry Division was located in Berkeley, 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 (6,41). Additional work of this new Division focused on insect and disease infestations in which the Service had close cooperation with the Bureau of Entomology in the Department of

Agriculture. (86)

Wildlife

Perhaps the best known wildlife management issue of the first two decades of this century is predator control. Victor Cahalane has provided an outstanding summary of the development of predator control activities in the national parks with emphasis on events at Yellowstone. Interestingly, his writing indicates a gradual reduction in control efforts occurred during the period of park protection by the military. Control then expanded significantly when the Service took charge in 1916 with ungulate protection being advanced as the paramount reason. Ten years later, however, the Service's vigilance in this effort had wained somewhat. (134)

It was also during the Mather administration that overabundance of ungulates was first noted. It is now obvious that 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. A cycle of over protection of ungulates and supplemental feeding would leave it's mark on park wildlife for many years to come.

Another sidelight, which is indicative of early wildlife management philosophies, is recounted in Swain's book on Horace Albright. Swain explains that Albright felt wildlife should be viewed by the public and so various species were kept in cages and elaborate bear feeding grounds were established. (98)

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). (81) Thus, the tradition, originally championed by the early military custodians, of artificial manipulation of the fishery resource in national parks became firmly entrenched.

Early Insight

In retrospect, many of the manipulative activities which were imposed on park resources, during these early years of agency administration, were scientifically improper but, in their historical context, they represented the state of the art and generally accepted thought. 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 value of parks in terms of contribution to scientific understanding was recognized and the Association urged the Service not to introduce non-native species and not to interfere with natural conditions. (85)

HORACE ALBRIGHT

The first major efforts aimed at organizing the 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 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. (21) 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 interpretive 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.

During this time, Fire Control Expert 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. (11) 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. (37) Vegetation type maps were prepared for a number of national parks and White Pine Blister Rust control efforts were intensified (16,37). White Pine Blister Rust (WPBR) control actually began as early as 1915 in Yosemite and in 1921 in Acadia National Park (16,86).

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. (12)

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.

In 1929 and 1930, Wright personally financed and conducted the first comprehensive survey of wildlife problems in the national parks. In 1931, office space was provided to Wright in the Berkeley office of the Branch of Research and Education. (97)

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. (67) 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. (67)

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. (67)

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. (18)

Predator control continued as an area of concern during Albright's administration. The following excerpt, from Cahalane's writings on this subject, provides interesting insight on this issue.

In 1928, the scientific viewpoint on predator control was presented to a conference of superintendents by Dr. Joseph Grinnell, Director of the Museum of Vertebrate 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 scientific investigation. Among the organizations insisting upon this course were the American Society of Mammalogists, the Wilson Ornithological Club, Cooper Ornithological 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.... (134)

Despite this affirmative step, predator control would surface as an issue in future years (74).

Albright's administration was plagued with many other

wildlife population problems including the mule deer over abundance 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 (24). 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 wild life 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 (69).

ARNO CAMMERER AND THE NEW DEAL

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, and forestry. A discussion of some of these areas follows.

Wildlife Management

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

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.

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 (69). 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.

In addition to this oversight responsibility, the Division was involved in the designation of a number of Research Reserves

in the parks as well as matters like mosquito control, predator control and exotic plant management (69).

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

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.) (97)

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 (97). Much of the wind was knocked out of the sails of the Division. Following Wright's death, Victor Cahalane took charge of the Division and he attempted to continue the initiative started by Wright.

Geology

Although little has been written about the geological program of the Service, it appears to have been very active during the 1930s. A total of 21 geologists were appointed under the Emergency Conservation Work program. (25)

As might be expected, much of the work accomplished by these early geologists was interpretive in nature. Undoubtedly 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. The 1936 "Annual Report of the Director" provides an excellent summary of the activities of the geologists. Projects listed in that report include excavations at Fossil Cycad National Monument and Dinosaur National Monument, preparation of policy on cave development, seismograph operation at Lassen National Park, and salvage geology at the future site of Boulder Lake. (25)

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. 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 (63). 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 (89). Perhaps this was done in anticipation of the extensive forest management projects that the CCC men would be completing. In short order, three other staff

positions were added to the forestry office (63).

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. (86)

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 campground management (15).

The Branch worked on insect control, disease control, and nursery operations. 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. (13)

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" (39). 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 (26).

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.

An "Eclipse" Begins

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 (44). 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 that formed this new Section (97). Supervisor of Fish Resources, David Madsen, and Assistant Wildlife Technician E. L. Green were transferred to the Bureau of Fisheries (45).

Fortunately, the Branch of Forestry remained more or less intact but the activities of the geologists dwindled.

NEWTON DRURY AND WORLD WAR II

When Newton Drury took charge of the agency in 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.

Wildlife Biology and Research

Activities of the wildlife biologists all but evaporated. until Cahalane's reassignment back to the Service from the Bureau of the Biological Survey in 1944.

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. (141) 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 emphasis placed on basic data collection, research based on needs, and identification of potential cooperating organizations. (70)

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" (66).

Forestry

The story of the Branch of Forestry is somewhat brighter.

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.

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.

War Threats to Forestry

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 one of the more significant was logging.

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 C C C workers disbanded and park employees greatly reduced, this looked like a real danger; but no clear evidence of such arson was ever seen. (88)

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 (46). 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. 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. (88)

Drury fought these proposals and as a result was forced to resign in 1951 by the Secretary of the Interior who favored the ideas. By the end of 1951, the Secretary reversed his opinion but Drury was not invited back.

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. (88) 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. (88) Needless to say, those eight months were over before any important changes occurred in the management of park resources.

CONRAD WIRTH

Conrad L. Wirth was chosen to succeed Arthur Demaray. Wirth had extensive Service experience, having started his career 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. (99)

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 (136). 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. (99) 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 two documents indicated that additional funds were sought under the Mission 66 umbrella for soil and moisture conservation, forest pest management, wildlife management and fire control (42,43). Undoubtedly, limited increases were received, but, no major strides were made during the 1950s.

Organization

Division of Natural History

The nucleus of the biological scientific staff was Victor Cahalane, who had returned to the Service. However, the science staff remained very small throughout the 1950s.

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.

During the 1950s, most of the biological staff was stationed in parks and regional offices. 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 parks (36). 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 (66). A 1959 conference report also indicates that management biologists were assigned to Regions Two, Three, Four and Five (77). 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.

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 (84).

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 (84).

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.... (86)

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

During this same period, some regions apparently had Regional Foresters on their staffs (36) and a handful of fire control aids and experts were added to the staff of larger parks where fire was a problem (86).

Wildlife Management Programs

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 (54).

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 (56,66).

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 (73,76). 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 (162). Most of these problems centered around deer and elk (1621).

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.' (87)

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.'... (83)

Fisheries Management Programs

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. (66)

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.

Forest Protection Programs

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 (30,32,35). In 1952, efforts began to control Oak Wilt at Effigy Mounds National Monument (16). In 1954, those control efforts were expanded to include Shenandoah National Park (16,32). 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 Caterpillar, Spruce Bark Beetle, and Douglas Fir Beetle (16,30,32,33).

In 1951, a Tree Preservation Crew was established to work in Region One (29). Most of their work was in the National Cemeteries, although it extended to other historic sites and even Acadia and Mammoth Cave National Parks (30).

As was the case during the 1930s and 1940s, fire control remained a high priority (16). In 1952, smokejumpers were assigned to Yellowstone National Park for the first time (30). Sixty-eight primary fire lookout stations were operated during this period and major efforts to mechanically remove fuel loads were undertaken (16).

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 (66).

Emergence from the "Eclipse"

The early 1960s evolved as a time which 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 during the next Director's administration.

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 (21). 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 (21). 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. (20,21)

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.

GEORGE HARTZOG

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 function of this new Division was solely interpretive while the Office of Natural Science Studies was given the responsibility for natural science research.

... 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. (97)

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.

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" (20). 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. (97) Much of the success which the Service had in developing its 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 (55).

Natural Resources Management

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.

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. (86)

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. 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.

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

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.

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. In June of 1969, the U. S. Court of Appeals ruled in favor of the Department stating that the Secretary of the Interior was responsible for proper management of park wildlife populations.

(66) Despite this decision, this would remain a nagging issue for many years.

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.... (6)

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. (97) 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 Denver, Colorado.

... 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. (135)

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 (65).

DIRECTOR AFTER DIRECTOR

Between January 1, 1973 and April 24, 1980, a sequence of three different Directors came to the helm of the agency. (163) 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.

Organization under Walker, Everhardt, and Whalen

As with the Hartzog administration, the seven years of the Ronald Walker, Gary Everhardt, and William 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 styles 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. (115,125) 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. Of far greater importance is a review of the most significant changes related to natural science and resources management.

The Scientists

The Chief Scientist. Robert Linn left the position of Chief Scientist on June 30, 1973 and was immediately assigned to coordinate research conducted at Michigan Technological University. Dr. Theodore W. Sudia was appointed as his replacement. (55) 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 what eventually became an abortive attempt at establishing a centralized science center.

On December 15, 1972, the Service entered into an agreement with NASA to establish a science center at NASA's 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. Staffing reached 13 permanent and 21 seasonal personnel.

The three main program thrusts were: Natural Landmark Studies, Resources Basic Inventory (including a sociologist), and

the Ecological Services Laboratory....(70)

The Center was destined for a very short life, however.

The abolishment and phaseout of the National Park Service Science Center (NPSC) was officially announced on June 30, 1976. (70)

Scientific 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.

Air and Water Quality

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. (151) 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 (49,101,103). 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. (102)

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 cannot be degraded.... (158)

Water quality was another area of major concern.

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.... (158)

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.

Minerals Management

Legislation which established Mt. McKinley National Park in 1917, 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.... (122)

Between 1971 and 1976 conservation organizations repeatedly called attention to mining activities within the National Park System (113,114,122,129,131,159).

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.

The Rangers and Resource Managers

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.

Resource Management Programs

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 (47). 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.

Forest Protection

The reader will recall that forest protection had developed into a strong program during the 30s and 40s with residual strength continuing into the 60s. With the advent of major social problems in the parks, in the late 60s and early 70s, forestry and other resource protection activities took a back seat to law enforcement. One significant exception to this was fire management.

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 NWCG [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 guidelines to give more specific standards for the conduct of its fire program.... (92)

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 (107,116,152,158,160). The National Parks and Conservation Association conducted a systemwide survey in 1977 which identified 48 parks with feral and exotic animal problems (121). Most famous in this group were the burros of the Grand Canyon (128). 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. (128)

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

(BIMS). 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.

Park Resource Conditions

Almost from the creation of the National Park Service, a series of reports on the condition of park resources and threats to those resources had been prepared. Little was done in response to those reports until the Service was forced by Congress to prepare an internal report.

In May 1980, shortly after Director Whalen left his position, a 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.

RUSS DICKENSON

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 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. (62) 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. (147) With this move, came a re-alignment 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.

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 (104,124). 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.

Major Administrative Issues

The staff of the Washington office made major strides in administration of resources management programs with particular emphasis on:

- 1) Issuance of two 'State of the Parks' reports which turned the Service's attention back to resource protection. (50)
- 2) Increased training for natural resource managers. (51)
- 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.
(51)

- 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.

Although some of these resource programs would wane, they formed the foundation for activities well into the 1980s.

During much of Dickenson's administration, an effort to revise the general regulations which apply to the Park System was underway. The first major revision was completed in 1984. This revision was not completely without problems however. The major obstacle centered around hunting and trapping. The Service argued that these activities could only occur in areas where it was specifically authorized by Congress. In 1984, the National Rifle Association filed a suit against the Department of the Interior challenging the Service's ban on hunting and trapping. In the spring of 1986, the United States District Court ruled in favour of the National Park Service.

This same revision of the regulations called for a ban on commercial fishing everywhere but where it was Congressionally authorized. Once again, in 1984, the Service canvassed park areas to determine the extent of commercial fishing activities. To date, nothing has been done with this issue.

Major Resource 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 (142) and wolves (145,153), control of feral goats (3,9) and European wild boar (107,116), concern over the status of the Florida panther (106,138), and mosquito spraying at Fire Island National Seashore (105,110). Other challenges centered around visitor use of the parks. Snowmobiling was reopened as an issue (117,118,119,132); use of mountain bikes on park trails threatened park resources (146); and nude bathing was linked to resource degradation (112,164). The presence of Giardia in park waters posed problems for visitors (148). 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 (139,149,154); tar sands mining in southern Utah would be potentially damaging to an extensive number of parks (133) and integral vistas, views between points inside parks and other points outside of parks, became a concern (109).

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. (19)

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 (111). By 1985, the issue evaporated as the majority of the feral burros were either removed alive or shot.

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 a 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 G. 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 Interagency 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. (155)

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 (75). In April of 1980, the Department was sued by the Organized Fishermen of Florida and in 1981, Secretary Watt reopened this issue to public comment. Watt hoped to be able to reopen the park to commercial fishing (100). The court ruled in favor of the Service but the case was appealed. It finally reached the United States Supreme Court which refused to hear the case in June of 1986. Thus commercial fishing was outlawed at Everglades National Park. (71)

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 (157). 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 (123,130,144). Canyonlands National Park was threatened with the installation of a high-level nuclear waste storage facility within close proximity of its boundary (133).

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.

WILLIAM PENN MOTT

Shortly after Mott took charge of the agency, he proposed entrance into a major planning/goal setting initiative. This evolved into the Twelve Point Plan - an umbrella of statements of concerns under which a plethora of individual projects were proposed. Concerns ranged from improvements in interpretation to better employee housing to movement of facilities out of critical resource areas. Of particular note were the points which address resources management issues:

- Develop a long range strategy to protect our natural, cultural, and recreational resources.
- Share effectively with the public our understanding of critical resource issues.
- Seek a better balance between visitor use and resource

management. (52)

One of the actions proposed in the 12 Point Plan was the appointment of a Blue Ribbon Panel with the goal of examining the Leopold Report as well as policies and programs related to natural resources management. In early 1988, the National Parks and Conservation Association announced that it would undertake this task independently. (60)

Organization

On December 16, 1985, Dr. Ted Sudia returned to the agency in the capacity of the Senior Scientist. About this time, it appears that the Division of Biological Resources became the Science Support Division.

January of 1987 brought further changes. Dr. Briceland left the position of Associate Director for Natural Resources and Dr. Gene Hester, formerly of the U.S. Fish and Wildlife Service, replaced him. During the same month, the Energy, Mining and Minerals Division was transferred under the Land Resources Division which reports to the Associate Director for Operations. Finally, creation of a Wildlife and Vegetation Division was proposed but implementation did not occur until February 1988. Most of the Science Support staff was moved into this Division while a handful of employees remained in the Office of the Chief Scientist. (72)

Servicewide Programs

Between 1985 and 1988, efforts were made by the Service to get somewhat better organized in terms of resources management planning and budgeting. Each of these areas went through a number of evolutionary changes which involved an ever increasing amount of computerization.

Between 1986 and 1987, the Service began to focus on the need to assess agency-wide conditions related to park resources. This materialized as the Natural Resources Assessment and Action Program (NRAAP). Information gathered through this evaluation was computerized and identified funding, manpower, project priorities, planning status, and resource conditions. Results from this assessment were used to identify un-met funding needs and to set priorities for the various natural resources fund sources (these had evolved from the original SRP funds).

Threats reporting also evolved as a component of the 1987 NRAAP. In September 1987, a new threats report was compiled but would not be released until 1988. (72)

Coincidental to the release of this report, the Service started several projects which have been long overdue. First, a task force was brought together to develop standards for baselined inventory and long-term monitoring programs. Second, a guideline for the preparation of resources management plans was developed, and, third, an editorial board was convened to guide the preparation of a Servicewide Guideline on Natural Resources Management.

Other areas which were topics of considerable discussion

during this time were career ladders for natural resources management personnel, classification, organization of regional offices regarding natural science and natural resources management, and the natural resources management trainee program. (57) Despite the ups and downs of the trainee program, a fourth group of trainees started their coursework in the spring of 1988.

Noteworthy Resource Issues

By 1988, several resource issues were emerging as hot items of the Mott administration. The peril of the Florida panther was highlighted and significant interest was placed in habitat protection through land protection around Big Cypress National Preserve. The decline of wolves at Isle Royale was being monitored closely by researchers and the issue of wolf re-introduction at Yellowstone was given serious consideration. (150) Concern over the degradation of park resources by air pollutants evolved into a Servicewide interpretive theme during 1988 and a series of prototype ecosystem monitoring programs was established to attempt to monitor the impact of air pollutants on park resources.

In 1986, a task force report on Wilderness Management within the system was released and in 1987, a Servicewide Wilderness Coordinator was finally designated. The Service was finally making headway in addressing a void which has existed for many years. (59)

The Service's fish stocking policy came under fire at North Cascades National Park. This prompted the Director to issue a letter which finally provided some concrete guidance on dealing with fishery issues and clearly narrowed the number of situations in which stocking would be permitted. (58)

Surprisingly, the idea of draining Yosemite's Hetch Hetchy reservoir and removing the dam, with the goal of restoring the valley to natural conditions, surfaced on the agenda of the Secretary of the Interior and the Director. The idea was given serious consideration despite major obstacles like finding an alternate water supply and the rather unique challenges which would face resource managers in the restoration process. (140,143)

By far the most publicized resource issue of Mott's administration were the major wildland fires which occurred in Yellowstone during the summer of 1988. Significant acreage in the park burned and a national debate on NPS fire management policy followed. The long-term effect of the policy debate will evolve over the next several years but clearly the biological effects have been positive. This event has spurred the development of one of the most comprehensive research initiatives of the Service.

Close on the heels of the fires came the Valdez oil spill in Prince William Sound, Alaska in 1989. This disaster caused significant resource damage in Kenai Fjords, Katmai and Aniakchak. Final assessment of the scope of the resource damage has not been done but the Service is more acutely aware of the need to develop baseline resource information and an outstanding, though unfortunate, opportunity presents itself to monitor the long-term impacts of oil spills in the environment.

Criticism

Despite the efforts made during this period, several documents were published which severely criticized the Service on resources management programs. The General Accounting Office (GAO) released a report which chastized the Service for:

- failing to prepare Resources Management Plans,
- failing to use Resources Management Plans in budget decisions,
- failing to adequately track threats,
- failing to implement initiatives proposed in 1981,
- and, failing to seek additional funding for resources management. (10)

Close on the heels of the GAO report came a major plan from the National Park and Conservation Association titled, Investing in Park Futures - The National Park Plan: A Blueprint for Tomorrow. Volumes which addressed specific resources management concerns include Volume I - To Preserve Unimpaired - The Challenge of Protecting Park Resources and Volume II - Research in the Parks: An Assessment of Needs. (1)

In May 1988, the Wilderness Society issued a report on what the Society considered the ten most threatened park units. Concerns included logging, exotic animals, intense use, and adjacent development. (108,127)

Despite the criticism and call to action, an up beat pattern seems to be emerging. 1989 will bring a new administration to Washington along with an ideal opportunity for significant changes in resource protection. These reports have laid the groundwork for that action.

One of the actions proposed under the 12 Point Plan was the appointment of a Blue Ribbon Panel. The role of this group was to re-examine the Leopold Report as well as policies and programs related to natural resources management. In early 1988, the National Park and Conservation Association announced that it would undertake this task independently. (60) This critique may provide long-term guidance to the agency on resource concerns. Guidance which is sorely needed in some areas.

Summary Comments

Despite the ups and downs of resources management within the National Park Service over the years, major advances in the right direction have been made. Much work still remains, however and that progress should not cease. Perhaps the 1990s will be a decade of environmental reconsideration and greater support and opportunities will be given to the Service. Whatever occurs in the future, the Service must regularly remind itself of it's fundamental mission.

The following quotations set a context in which natural resources management must continue within the National Park System:

... 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 (38)

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 (38)

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.

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