The Rise and Decline of Ecological Attitudes in National Park Management, 1929–1940

Part II: Natural Resource Management Under Directors Albright and Cammerer

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When the wildlife biologists under George Wright began their survey of national park wildlife in 1929, the U.S. National Park Service had been in existence nearly 13 years, yet it had never systematically researched the parks' flora and fauna, nor had it articulated a comprehensive set of policies for the management of nature in the parks. By chance, publication of the biologists' survey report, *Fauna of the National Parks of the United States,* known as Fauna No. 1, came in 1933, shortly after Congress created the Civilian Conservation Corps (CCC). Particularly through the CCC program, funds were soon available for national park biologists to implement the policies recommended in Fauna No. 1. Thus, Fauna No. 1 provided policies and the CCC provided funds for the Park Service to conduct its own natural resource management.

During the era of director Stephen T. Mather (1916-1929), the Park Service had relied heavily on scientific expertise from other federal bureaus; now it began to develop its own cadre of scientists, who were "park-oriented," as Park Service biologist Lowell Sumner later expressed it. Reflecting on the emergence of biological research and management in the Park Service, Sumner also recalled that Fauna No. 1 had quickly become the "working 'bible' for all park biologists."[65] This report truly represented the state of the knowledge for national park biological management in the 1930s. However, al-

[65] Sumner, "Biological Research and Management," 6, 10.

though the report did infuse more ecologically sensitive thinking into national park activities and was soon declared official policy, implementation of its recommendations was frequently disputed and never fully realized.

With the build-up of Park Service biological programs in the 1930s, a tension developed between management which focused on scenery and public enjoyment of the parks *versus* that which was based on the newly formulated concerns of the wildlife biologists. This tension had no real precedent, since the scientific, ecological perspective had not previously been expounded to any degree within the Park Service. Indeed, more than that of any other professional group in National Park Service history, the wildlife biologists' vision of the national parks challenged traditional management practices of manipulating natural resources to ensure public enjoyment—practices which had been accepted as standard procedure during the Mather era. The biologists stressed ecological preservation and would let nature take its course, except when manipulation of the resources was deemed necessary for ecological purposes. Yet, because of already powerful traditions within the Park Service, the wildlife biologists frequently encountered conflict and compromise (and often total rejection) in their efforts to change management. The conflicts over natural resource management that arose within the Park Service during the 1930s were a prelude to similar conflicts that would arise in the 1960s, involving many issues which remain meaningful today.

Among Fauna No. 1's recommendations, two were most fundamental: The Park Service should base its natural resource management on scientific research, including conducting "complete faunal investigations . . . in each park at the earliest possible date." And each species should be left to "carry on its struggle for existence unaided" unless threatened with extinction in a park. In effect, the remaining recommendations qualified or elaborated upon these two basic tenets, with specific statements on such concerns as protection of predators, artificial feeding of ungulates, protection of ungulate range, removal of exotic species, and restoration of extirpated native species.[66]

Regarding scientific research, the national park naturalists had noted at their 1929 conference that scientific data on the parks' natural history was "almost infinitesimal." This disheartening situation would begin to change that very year, as preparation of Fauna No. 1 got under way. Following completion of Fauna No. 1, scientific research continued under the guidance of George Wright, head of the Park Service's newly created Wildlife Division. Lowell Sumner later estimated that during the 1930s about half of the biologists' work involved research and wildlife management, while the other half was devoted to review and comment on proposed development projects (many of them being CCC projects). He calculated that prior to World War II the biologists had produced perhaps 1,000 reports. Having joined the Service in 1935, Sumner estimated that he himself prepared about 175 reports before the war began.[67]

The wildlife biologists conducted research on subjects such as bison, elk, and bird life at Wind Cave; white-tailed deer and winter birds in Shenandoah; grazing mammals in Rocky Mountain; and deer and bighorn in Glacier National Park.

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[66] Wright, Dixon, and Thompson, *Fauna of the National Parks* (1933), 147-148.

[67] National Park Service, "Proceedings," First Park Naturalists' Training Conference, Berkeley, California, 1-30 November 1929, typescript, 152, HFLA; Sumner "Biological Research and Management," 11.

Park naturalists contributed further to the gathering of information, such as at Great Smoky Mountains, where plant specimens of about 2,000 species were collected by the mid-1930s.[68] Given the large number of documents prepared and the limited number of biologists in the Park Service (about 27 at most), only a few of the reports and studies could have been in-depth works. Among the most thorough were Joseph Dixon's *Birds and Mammals of Mount McKinley National Park* (1938), published as number three in the Fauna Series, and Adolph Murie's *Ecology of the Coyote in the Yellowstone* (1940, Fauna No. 4). Murie's next major study, *The Wolves of Mount McKinley* (Fauna No. 5), was begun in 1939 and published in 1944.[69]

Research Reserves.

An important element of the biologists' programs during the 1930s was the establishment of "research reserves"—areas within national parks designated to be used for scientific research only. Likely at the urging of the Ecological Society of America and leading biologists such as John C. Merriam of the Carnegie Institution, who feared the disappearance of all unmodified natural areas in the United States, the Park Service in the mid-1920s gradually began to develop a research reserve program. In 1927, Yosemite National Park designated approximately seven square miles of high mountain country north of Tuolumne Meadows as a "wilderness reserve," later termed a research reserve, the first of its kind in the National Park System.[70] At their November 1929 conference, the park naturalists discussed the reserves, and concluded that they should be permanently set aside and should be primarily for scientific study. These areas were to be, as the naturalists phrased it, "as little influenced by human use and occupation as conditions permit." Park Service director Horace Albright followed up in the spring of 1931 by issuing a research reserve policy to "preserve permanently" selected natural areas "in as nearly as possible unmodified condition free from external influences." In effect, the areas would help meet Fauna No 1's recommendation for each species (whether flora or fauna) to "carry on its struggle for existence unaided." The reserves were to be entered only in case of emergency or by special permit; and, as a further means of protection, their location was not to be publicized.[71]

The research reserves emerged in the 1930s as the most preservation-oriented land use category the Park Service had yet devised—an important philosophical and policy descendent of Congress' mandate to

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[68] Victor H. Cahalane, "Activities of the National Park Service in Wildlife Conservation," (ca. 1935), typescript, Central Classified File, RG79; *Annual Report of the Secretary of the Interior for the Fiscal Year Ending June 30, 1936* Washington: Government Printing Office, 1936), 123.

[69] Sumner "Biological Research and Management," 11; Joseph S. Dixon, *Birds and Mammals of Mount McKinley National Park,* Fauna Series No. 3 (Washington: National Park Service, 1938); Adolph Murie, *Ecology of the Coyote in the Yellowstone,* Fauna Series No. 4 (Washington: National Park Service, 1940); Adolph Murie, *The Wolves of Mount McKinley,* Fauna Series No. 5 (Washington: Government Printing Office, 1944).

[70] Harold C. Bryant, "A Nature Preserve for Yosemite," *Yosemite Nature Notes,* Vol. VI, No. 6 (June 30, 1927), 46-48. John Merriam's interest in research reserves is found in Merriam to Members of the Committee on Educational Problems in National Parks, 12 February, 1930, with attachments, Entry, 17, RG79.

[71] National Park Service, "Proceedings," First Park Naturalists' Training Conference, 169, 171-174. Albright's policy on research reserves is stated in Arno B. Cammerer to All Superintendents and Custodians, 27 May 1931, with attachment, Research Reserves file, YOSE. The Fauna No. 1 quote is in Wright, Dixon, and Thompson, *Fauna of the National Parks* (1933), 147.

leave the national parks "unimpaired," and much more restrictive than the traditional policy of allowing park backcountry to be developed with horse and foot trails. The reserves were also precursors to national park wilderness areas established under the Wilderness Act of 1964. Designations such as primitive, primeval, wilderness, virgin, and roadless were used at times in association with the reserves.[72] In George Wright's view, the reserves' greatest value lay in providing scientists the opportunity to learn what certain portions of the parks were like in their original, unmodified condition—a "primitive picture" which would provide a basis of knowledge to benefit all future research. He also believed that the reserves would not become "an actuality" until their flora and fauna had been surveyed. To Wright, setting aside the reserves was a "most immediate urgency" which should be accomplished before further biological modifications took place.[73]

The research reserves became an integral part of park management in March 1932, when Director Albright asked that they be formally designated through the cooperation of the park superintendents and naturalists and the Washington office. He requested that the superintendents indicate the location of the reserves in the five-year park development plans (master plans), and he assigned the wildlife biologists responsibility for gathering information and tracking the progress of this program. By 1933, research reserves had been designated in Yellowstone, Sequoia, Grand Canyon, and Lassen Volcanic national parks. Others followed, in Great Smoky Mountains, Glacier, Mount Rainier, Rocky Mountain, Zion, as well as Yosemite, for a total of 28 designations in 10 parks.[74]

However, the research reserve idea worked better in theory than in practice. The wildlife biologists apparently did not participate in the actual selection of many of the reserves, likely because a number of the areas were designated while the biologists were busy completing Fauna No. 1, and because the biologists were unable to gain a meaningful role in the master planning process. As late as February 1934, the Wildlife Division seemed poorly informed on the exact location and character of many of the reserves; moreover, on those they knew something about, Wright noted that some of the areas did not lend themselves to becoming worthwhile research areas—indications that the biologists had little input in designating the reserves. A reserve in Lassen Volcanic National Park was no more than a strip of land three-quarters of a mile wide and about 5 miles long; while two of Grand Canyon's reserves were so close to the park boundary that activities outside the park were certain to affect their biotic makeup. Noting the potentially serious effects of external influences on the reserves, Wright advocated the establishment of "buffer areas" around the parks (including additional winter range for wildlife), rather than "withdrawing further and further within the

[72] See for instance The Director to Wild Life Survey, 4 March 1932, Entry 35, RG79; and Arno B. Cammerer, "Maintenance of the Primeval in National Parks," ca. 1934, typescript, HFLA. As conceived, the research reserves were analogous to the "primitive areas" being designated in the national forests, although there is no indication that the idea was borrowed directly from the U.S. Forest Service.

[73] George M. Wright to The Director, 14 March 1932, Entry 35, RG79.

[74] The Director to Wild Life Survey, 4 March 1932; George M. Wright, "Research Areas," 1933, typescript, Entry 34, RG79; Kendeigh, "Research Areas in the National Parks," 236-238.

park" to create reserves.[75] Like the parks themselves, the reserves were not truly satisfactory biological units.

Expressing deep concern about the reserve program, Victor H. Cahalane, Wright's assistant division chief, wrote in September 1935 of the problem of selecting research reserves in parks so "artificialized and mechanized." To Cahalane, the difficulty of finding even relatively small unaltered research areas to be specially protected indicated the extent to which the Park Service had failed to meet its basic mandate to protect the parks' wilderness character. Reflecting biologist Ben Thompson's earlier comments about alterations to the parks' natural conditions, Cahalane wrote that Glacier National Park had no pristine area worthy of becoming a research reserve. This had occurred "not by reason of a network of roads" in Glacier, but because

> all streams now contain exotic species of fish, because the wolverine and fisher have been exterminated from the entire park and the bison and antelope from the east side, and because exotic plants . . . have been carried to practically every corner of the park.

Recognizing the existing problems with "pristine" areas in the parks, Cahalane called for a "showdown on this matter of preservation of the greatest resource of the National Park Service—the wilderness."[76]

But beyond the difficulty of identifying largely unaltered natural areas to be designated research reserves, the reserves were the product of decisions made wholly within the Park Service, and thus were subject to administrative discretion and vulnerable to shifting philosophies of management. The reserves had no specific mandate from Congress. They could be supported, ignored, or, as happened to Andrews Bald research reserve in Great Smoky Mountains National Park, created and then summarily abolished. Indeed, the "show-down" that occurred over Andrews Bald went directly against the scientists' recommendations and reflected the Park Service's traditional disregard for scientific research. The outcome was an ominous portent for the science programs overall.

Designated a research reserve in the mid-1930s, Andrews Bald was one of several reserves in Great Smoky Mountains intended to be strictly preserved so that "ecological and other scientific studies" could be conducted on a long-range basis, especially to determine natural plant succession. (The "grassy balds"—open, mountain-top areas of grasses and low-growing shrubs, and without tall trees—were one of the primary scenic features in the Smokies, and were then and remain of special scientific interest). In early April 1936, a terrific wind storm knocked down trees in the vicinity of Andrews Bald and within the established reserve, precipitating a sharp debate in the Park Service as to how to manage the area.

Blown over by the storm, dead and dying trees cluttered the landscape and, in the minds of the superintendent and most of his staff, constituted a fire hazard which needed to be cleared up.[77] Superin-

[75] Wright to The Director, 14 March 1932; Wright, "Research Areas"; Thompson to Cammerer, 23 February 1934; and U.S. National Park Service, Wild Life Division, "Report for February, 1934," Classified File, RG79. Comments on buffer zones for the national parks are also found in Wright and Thompson, *Fauna of the National Parks* (1935), 109.

[76] Victor H. Cahalane to George M. Wright, 7 September 1935, Entry 34, RG79.

[77] H. W. Jennison, Memorandum for Superintendent J.R. Eakin, 21 July 1936, Balds file, GRSM.

tendent J.R. Eakin wanted a cleanup, as did the park's rangers and foresters, and in a letter to Park Service director Arno Cammerer, Eakin stressed the potential fire problems. Reflecting an ongoing disagreement over what to do with naturally downed trees, the superintendent noted that "again," the Wildlife Division and the naturalists were "not concerned with fire protection" and the danger that might arise if the dead trees were left in place.[78] Particularly concerned about scenery, Frank E. Mattson, the park's resident landscape architect, argued for cleanup of the windfall, stating that because the bald attracted so many sightseers it should be treated "much as a trailside or roadside" area.[79]

By contrast, the wildlife biologists (supported by park naturalist Arthur Stupka) advocated special consideration for the reserves, so that "ecological and other scientific studies . . . may be started and continued thru the years to come." They urged that the downed trees be left untouched. Although recognizing the fire prevention concerns, the biologists argued that the wind storm was a natural phenomenon and that cleanup of the area would "thwart the objectives" of Andrews Bald research reserve.[80] Still, Superintendent Eakin believed the area constituted a serious fire hazard and, in an exchange of correspondence with the Washington office, insisted that the damaged trees should be cleared.[81]

In a stinging reply to Eakin, Acting Director Arthur E. Demaray finally granted permission to clear the downed trees, but added that the Andrews Bald Biotic Research Area was thereby abolished. He further stated that "I wish to call your attention to several factors which you seem to have overlooked"—the reserve had been approved by Eakin himself, it was included in the park's master plan, and preservation of such areas was "an established policy of the Service." In the Acting Director's view, the superintendent's insistence was forcing a change in the official use of the area from research and strict preservation to recreation: "The reason the research area is now abolished is that you have convinced us you made an error in approving its establishment. Its apparent proper use is primarily recreational."[82]

Andrews Bald illustrated the vulnerability of the reserves to administrative discretion, and, as well, the vulnerability of research itself. An area committed to serve research purposes over a long period of time was subject to sudden modification as a result of internal decision making. Indeed, the urge to clear the damaged trees was not truly based on whim, but reflected the deep-seated, traditional allegiance of the superintendents, foresters, and landscape architects to preserving national park scenery and accommodating public use—while generally evidencing not much interest in science.

Even though the research reserves were supported by the director's policy pronouncement of 1931 and represented the bureau's strongest commitment to preservation of natural conditions, the Park Service eventually disregarded the entire program. Certainly most reserves did not vanish in as confrontational way as did Andrews Bald, yet Lowell Sumner later recalled that the research reserve program came to be largely ignored,

[78] J.R. Eakin to The Director, 27 July 1936, Balds file, GRSM.
[79] Frank E. Mattson, Memo for Mr. Eakin, 27 July, 1936, Balds file, GRSM.
[80] H.W. Jennison, Memorandum for Supt. J.R. Eakin, 21 July 1936, Balds file, GRSM.
[81] Eakin to The Director, 27 July 1936.
[82] A.E. Demaray to J.R. Eakin, 4 September 1936, Balds file, GRSM.

beginning about the time of World War II. The Park Service itself acknowledged in 1963 that the reserves were "dormant," and that many of the areas had "remained 'on the shelf,' awaiting a more favorable period for their utilization."[83] (This statement came at the very time Park Service leadership was withholding genuine support for the proposed Wilderness Act because it did not want to lose administrative discretion over national park backcountry.)

While it may seem that ignoring the research reserve program meant that these areas would be left alone and thus remain in an unaltered condition, this was very likely not the case. With the program untended and the reserves in effect forgotten, these areas of special research value were likely to be altered through such practices as fire protection (for example, the removal of dead trees from Andrews Bald), forest disease control, grazing, and fish stocking and harvesting. The neglected research reserves were subject to the kinds of modifications which concerned George Wright in the early 1930s when he stressed the "most immediate urgency" of establishing the reserves.[84]

Range Management and Concern for the Ungulates

In contrast to the research reserve program which was intended to leave selected natural areas undisturbed, allowing each species to fend for itself, the biologists believed that in other instances it was necessary to interfere with nature and (as stated in Fauna No. 1) assist certain species to combat the "harmful effects of human influence" in order to restore the parks' "primitive state." Fauna No. 1 also specifically called for preservation of ungulate range, and advocated that a park's "deteriorated range" should be "brought back to [its] original productiveness."[85] During the 1930s, of all the Park Service's attempts to interfere with nature, the manipulation of Yellowstone's "northern elk herd" received the greatest attention and ultimately became the most controversial.

To many familiar with Yellowstone, the park's northern elk herd seemed to have become so large that it was overgrazing its range. The resulting deterioration appeared to adversely affect use of the range by competing ungulates, such as deer and pronghorn. Concurring with this assessment, the wildlife biologists determined that the population of Yellowstone's northern elk herd needed to be reduced, in line with Fauna No. 1's recommendations. Reducing animal populations was not new to the Park Service, given the long-running predator control activities, and (beginning in the mid-1920s) the slaughtering of limited numbers of Yellowstone's Lamar Valley bison herd for population control. In addition, although concerns about over-population of elk had evolved by the early 20th century and the park had practiced limited elk removal for more than a

[83] Sumner, "Biological Research and Management," 10-11. In his history of wildlife management, Gerald Wright states that there is "no evidence" that the reserves were ever used as intended. Wright, *Wildlife Research and Management in the National Parks*, 19-20. The 1960s perception is found in Conrad L. Wirth, Memorandum to All Field Offices, 15 April 1963, HFLA.

[84] Wright to The Director, 14 March 1932. Keith R. Langdon, natural resource management specialist in Great Smoky Mountains National Park, recently commented on the considerable value Andrews Bald and other research reserves could have had for today's efforts to understand and manage the park's natural resources: If the park had maintained the reserves as originally intended, he stated, we would be "in the cat bird's seat." Personal communication with Keith R. Langdon, 18 July 1991.

[85] Wright, Dixon, and Thompson, *Fauna of the National Parks* (1933), 4, 147-148.

decade, there seems to have been no concerted reduction program prior to that encouraged by the wildlife biologists.

Reduction involved shooting large numbers of the park's northern herd, which mostly inhabited the Yellowstone and Lamar river basins. For humane reasons, shooting the animals seemed far preferable to allowing them to die of winter kill when heavy snows restricted their range; furthermore, reduction could bring the population to a specified level. As believed at the time, this plan would prevent overgrazing and deterioration of the winter range and benefit all grazing species. The elk reduction program thus sufficed as the principal management strategy for the park's grazing animals, with the exception of bison.

The wildlife biologists concluded that "human influence" had caused the winter range problems in Yellowstone. This state of the knowledge in the 1930s (which decades later would become intensely disputed) was based on several fundamental assumptions: National Park Service scientists and managers believed that, prior to Anglo-American settlement of the valleys to the north of the park, the herd had wintered in those valleys; and after the park was established its protected elk population had expanded enormously. They also believed that the elk population had crashed in the period 1917-1920, and that this dramatic decline had been caused by range deterioration through overgrazing. With drouth conditions affecting the range in the late 1920s and early 30s, and with elk populations believed to have increased due to protection in the park, a second population crash was seen as imminent—one which the Wildlife Division expected to bring on "hideous starvation and wastage."[86]

In 1931 Park Service biologists Joseph Dixon and Ben Thompson (who were working with George Wright on Fauna No. 1) had participated in a reconnaissance of the deer population irruption in the Kaibab National Forest, north of Grand Canyon. Their report asserted that an over-population of deer threatened the national forest, and recommended reducing the deer herds. Likely influenced by what seemed to have happened in the Kaibab, the biologists made their recommendation that Yellowstone's elk population also be reduced. And in a February 1934 report documented with numerous photographs (and reprinted in Fauna No. 2), the Wildlife Division announced that, as a result of an overpopulation of elk, Yellowstone's northern range had been overused to the point that it was in "deplorable" condition. The biologists believed that the situation had worsened since they first saw the area in 1929 and that it now threatened the survival of other animals dependent

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[86] Wildlife Division to the Director of the National Park Service, "Report Upon Winter Range of the Northern Yellowstone Elk Herd and a Suggested Program For Its Restoration," 28 February 1934, reprinted in Wright and Thompson, *Fauna of the National Parks* (1935), 85; Douglas B. Houston, *The Northern Yellowstone Elk: Ecology and Management* (New York: Macmillan Publishing Co., 1982), 24-25; and Don Despain, Douglas Houston, Mary Meagher, and Paul Schullery, *Wildlife in Transition: Man and Nature on Yellowstone's Northern Range* (Boulder, Colorado: Roberts Rinehart, 1986), 22-24. See also Arno B. Cammerer to Joseph Grinnell, 10 December 1934, with attachment, Arno B. Cammerer files, MVZ-UC; and Victor H. Cahalane, "Wildlife Surpluses in the National Parks," in *Transactions of the Sixth North American Wildlife Conference*, 1941, Washington, American Wildlife Institute, 357-358. Douglas Houston's detailed analysis of the management of the parks northern elk herd, *The Northern Yellowstone Elk*, 12-15, refutes the belief that a population crash occurred in 1917-1920.

upon the range. The report argued that the overpopulated elk herd was on the "brink of disaster," and warned that the next hard winter would cause starvation and death for thousands of elk.[87]

Indeed, the elk reduction program had strong, apparently unanimous support among the Park Service's wildlife biologists. Their statements and reports did not equivocate on the wisdom of artificially lowering Yellowstone's elk population. Commenting in the late winter of 1935 that, without reductions, the elk problems would continue—the "old winter range ghost will be walking again"—Wright himself saw the program as critical to the success of the park's wildlife and range management.[88] Also, Olaus Murie, who had overseen the Bureau of Biological Survey's elk management in Jackson Hole, south of Yellowstone, provided supporting insights on the northern herd. He urged reducing the herd, as did his brother, Adolph, a respected National Park Service scientist. In late December 1934, just before the first big reduction began, Olaus Murie wrote to Ben Thompson approving elk reduction, noting that "if carefully handled it will be successful," and adding that he looked forward "with great interest to the outcome of the experiment."[89]

Beyond their own observations, the biologists based their elk policy on research conducted in the region in the 1920s and early 1930s by U.S. Forest Service biologist W.M. Rush, whose work was privately funded with money obtained by Park Service director Horace Albright. Rush's conclusions supported the biologists' views.[90] Also, since they believed that longer hunting seasons and increased bag limits in Montana and on adjacent Forest Service lands would provide only limited help, the biologists recommended that the park itself be involved in the reduction to ensure that the proper number of elk would be taken each winter. As the biologists noted, until the desired population level was reached, Yellowstone must be prepared "to slaughter elk as it does buffalo."[91]

Much more cautious, however, was the opinion of Joseph Grinnell, head of the University of California's Museum of Vertebrate Zoology and mentor to numerous Park Service biologists. Asked by Director Cammerer to comment on the proposed reduction, Grinnell observed that the elk situation in Yellowstone was "truly disturbing from any point of view." He remarked on the "dam-

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87 Dunlap, *Saving America's Wildlife*, 69; Wright and Thompson, *Fauna of the National Parks* (1935), 85-86.

88 George M. Wright to H.E. Anthony, 15 March 1935, George M. Wright files, MVZ-UC. Victor Cahalane later indicated that outside support for the reduction program existed, but that there was "constant protest by a few local organizations." However he was not specific as to which organizations or individuals supported or opposed reduction. Victor H. Cahalane, "Elk Management and Herd Reduction—Yellowstone National Park," *Transactions of the Eighth North American Wildlife Conference*, 1943, Washington, American Wildlife Institute, 1943, 95-97.

89 Olaus J. Murie to Ben H. Thompson, 27 December 1934, Entry 7, RG79 (copy from files of William E. Brown); Adolph Murie to Victor H. Cahalane, 26 July 1936, YELL.

90 Wright, Dixon, and Thompson, *Fauna of the National Parks* (1933), 118. Albright mentions securing private funds for Rush's research in Horace M. Albright to the Director, 18 October 1937, Central Classified File, RG79.

91 Wildlife Division to the Director, "Report Upon Winter Range of the Northern Yellowstone Elk Herd," 85-86; Arno B. Cammerer, Memorandum for Assistant Secretary Walters, 21 November 1933, Central Classified File, RG79. The Park Service also saw overgrazing as a "landscape problem," and Fauna No. 2 advocated close cooperation between the wildlife biologists and landscape architects to address this concern. Wright, Dixon, and Thompson, *Fauna of the National Parks*, (1933), 109-120. It does not appear, however, that the landscape architects became much involved.

age" which he believed elk grazing had done to the winter range, and agreed that human influences had been an important factor in bringing on the situation. Although he carefully avoided criticizing the decisions of his former students and close friends, Grinnell withheld support for the reduction program. Rather, he expressed hope that the killing of any park animals, including predators as well as elk, would become a thing of the past. In his summation, Grinnell advocated "adjustments through natural processes" to restore the "primeval biotic set-up."[92] More than the Park Service biologists of the 1930s, Grinnell expressed faith in allowing "natural processes" to control elk populations, with aggressive measures taken to reduce adverse human influences on the animals. He thus voiced elk management policies that the Park Service would eventually put into effect, after the reduction program had been underway for more than three decades.

Reduction began in January 1935, with Yellowstone's rangers shooting the elk and preparing their carcasses for shipment to tribes on nearby reservations. With the intention of reducing elk population to the range's "carrying capacity," the Park Service's goal of killing 3,000 elk the first winter included animals to be taken outside of the park under Forest Service and Montana State Fish and Game Department regulations liberalized to increase the number killed by hunters.[93] During the first reduction effort, hunters on lands adjacent to Yellowstone took 2,598 elk (up from only 136 the previous year) and park rangers killed 667 (up from only 11 in 1934), for a total of nearly 3,300.[94]

Responding to an inquiry from the American Museum of Natural History in March 1935, George Wright expressed relief that the Park Service itself had not had to kill large numbers of elk during the initial reduction; yet he wrote that "we are glad to have established a satisfactory precedent" regarding the "propriety of direct control" in the national parks. Yet, even after further reduction in 1936, biologist Adolph Murie studied Yellowstone's range and found it "undoubtedly worse" than it had been in six or seven years. Murie recommended that the kill be increased to 4,000 the following winter. A lengthy 1938 report by Yellowstone ranger Rudolph L. Grimm again confirmed the belief that the range was overgrazed, and advocated continued reduction.[95]

With a "satisfactory precedent" established in the mid-1930s, Yellowstone's elk reduction program began its long history, with the policy eventually being applied in other areas, particularly Rocky Mountain National Park. At the end of the decade, the wildlife biologists reported that the "basic and most important problem" at Yellowstone continued to be the condition of the park's range. "As in the past," they

[92] Joseph Grinnell to Arno B. Cammerer 26 December 1934, Arno B. Cammerer files, MVZ-UC.

[93] Cammerer to Grinnell 10 December 1934.

[94] A list of annual elk "removals" from 1923 to 1979, including those taken by hunters near the park, is found in Houston, *Northern Yellowstone Elk*, 16-17.

[95] Wright to Anthony, 15 March 1935. Murie to Cahalane, 26 July 1936. Rudolph L. Grimm, "Northern Yellowstone Winter Range Studies," 1938, typescript, 28-29, YELL. Although convinced that the range was still overgrazed, Grimm perceived that some "range recovery" had occurred, particularly in the two years just before he wrote his report. However, he credited "favorable climatic conditions," i.e. the end of the drought (rather than the elk reduction program), as the "agency most responsible for the improvement of the range plant cover." (p.27)

asserted, the abundance of elk "depletes the forage of other ungulates using the same range."[96] Although he did not speak out aggressively against the reduction program, Joseph Grinnell continued to oppose it, writing to Arno Cammerer in January 1939 that he did not approve of regulating "the numbers of certain animals in certain Parks."[97] Grinnell urged that the Service submit the problem to a group of specially trained ecologists. (This approach, when implemented in the early 1960s, resulted in the "Leopold Report," which clearly recommended that the reduction policy be continued, not terminated. Only later, in 1967-68, did the Park Service change its elk policy to the "natural processes" concept, in line with Grinnell's ideas.)[98]

Bison Management

As with to elk management, bison management in the 1930s did not create discord between the wildlife biologists and other Park Service personnel. Moreover, throughout the decade, management of bison in Yellowstone's Lamar Valley (the herd of most concern to the Park Service) remained more intensive and varied than that given the park's elk. Using domestic livestock ranching methods first developed by the Army, then expanded during Director Mather's time, bison management changed little during the decade. With operations still headquartered at the Buffalo Ranch along the Lamar River, bison work primarily involved rounding up and corralling the herd in the winter for feeding, vaccination (for hemorrhagic septicemia), and for removal of excess animals (or those not wanted for breeding) by slaughtering or shipping them live to other areas.[99]

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[96] National Park Service, *Wildlife Conditions in National Parks,* 1939, Conservation Bulletin No. 3, Washington D.C., 1939, 8. Other parks which eventually initiated limited control programs included Yosemite and Sequoia. Wright, *Wildlife Research and Management in the National Parks,* 77-78.

[97] Joseph Grinnell to Arno B. Cammerer, 23 January 1939, Arno B. Cammerer files, MVZ-UC.

[98] A. Starker Leopold *et al.,* "Wildlife Management in the National Parks," in *Transactions of the Twenty-eighth North American Wildlife and Natural Resources Conference,* ed. by James B. Trerethen, (Washington, D.C.: Wildlife Management Institute, 1963), 39-41, 43. Philosophically and policy-wise, the elk management situation became more complicated when, in 1967-1968, the Park Service terminated elk reduction in Yellowstone. Likely as a gambit to find an acceptable justification in a politically charged situation, the Park Service attempted to base its decision to terminate reduction on the Leopold Report's recommendations—which in fact had urged continued reduction. Starker Leopold, who was the report's principal author (and who also had studied under Joseph Grinnell), continued to doubt the wisdom of the Park Service's new "natural process" elk management policy. In June 1983, a little more than two months before his sudden death, Leopold made perhaps his last written comments on this issue. Seriously questioning the natural process concept of park management as it applied to elk and other grazing animals, he in effect sided with the Park Service biologists of the 1930s, observing that the national parks were "too small in area to relegate to the forces of nature that shaped a continent." National Park Service, United States Department of the Interior, News Release, "National Park Service Director Hartzog Initiates Elk Management Program for Yellowstone National Park," 1 March 1967, with attachment, George B. Hartzog, "Management Program, Northern Yellowstone Elk Herd, Yellowstone National Park," 1 March 1967; A. Starker Leopold to Jack Anderson, 16 March 1971, Hartzog Papers; and A. Starker Leopold to Boyd Evison, 9 June 1983, Leopold Papers. See also A. Starker Leopold, Interview Conducted by Carol Holleuffer, 14 June 1983, Sierra Club Oral History Project, Sierra Club History Committee, typescript, 19-20.

[99] The Lamar Valley bison herd, introduced in the early twentieth century, came from two subspecies, both different from the remnant wild herds located in other areas of the park. While the wild herds at times interbred with the introduced Lamar Valley herd, they were almost always left alone and did not receive the intensive management as did those in the Lamar Valley. See Margaret Mary Meagher, *The Bison of Yellowstone National Park,* National Park Service Scientific Monograph Series no. 1 (Washington: National Park Service, 1973), 26-37.

Principally, the lack of discord resulted from the wildlife biologists' acceptance of the need to manipulate the herd for ecological purposes. In fact, in Fauna No. 1 the biologists had little to recommend regarding bison management, stating only that winter feeding of the animals was "absolutely necessary." Yet, regarding *all* park fauna, the report's recommendations called for putting threatened species on a "self-sustaining basis" when such measures as feeding were no longer necessary. Similar counsel was included in Fauna No. 2. Noting that bison had been saved from extinction in the park by intensive management, the latter report urged returning this species to its "wild state" to the degree that the "inherent limitations" of each park would permit. The biologists believed that such measures as winter feeding and slaughtering would have to continue until "artificial management" was no longer necessary.[100]

Based upon recommendations made during the late 1920s and early 30s, the park sought to keep Yellowstone's Lamar Valley herd limited in size, at first seeking a population level of 1000 animals, then 800 beginning about 1934—levels believed within the "carrying capacity" of the bison range and what the Buffalo Ranch facilities could accommodate.[101] But even by the following year, some concern was being expressed that the population was much too high. Harlow B. Mills, a biologist at Montana State College who had worked in Yellowstone, wrote an extensive report on wildlife conditions in the park in 1935, recommending that the Lamar Valley herd be reduced to "100 or less animals." Mills believed there were likely too many bison in Yellowstone, and that the current population was probably greater than under primitive conditions. The ranching operations seemed to be a loss of "energy, time, and money." And while Yellowstone had helped save America's bison from extinction, Mills added that the bison "has been saved and there is now no necessity of fearing that the species will disappear." But, despite Mills' recommendations, the Park Service maintained the population level at close to 800 through the remainder of the 1930s.[102]

The methods used to maintain the desired population were reported in Fauna No. 2, which also provided statistics on bison losses in recent decades: Since the Army began its bison management in 1902, 682 of the animals had been slaughtered, 279 had been shipped live, and 48 "outlaws and cripples" had been destroyed. In addition, 124 bison had died from disease during this period.[103] In 1935, the year Fauna No. 2 was published, George Wright expressed his considerable displeasure with live shipping, whether of bison or elk, and whether to other national parks or to state or local parks. He believed that such activity involved the "inadvised mixing of related forms and the liberation of certain species in areas unsuited to their requirements," which brought "great and ir-

[100] Also, both Fauna No. 1 and No. 2 recommended reestablishing bison in Glacier National Park, in cooperation with local Indian tribes. The comments on bison are found in Wright, Dixon, and Thompson, *Fauna of the National Parks* (1933), 117, 147; and Wright and Thompson, *Fauna of the National Parks* (1935), 59-60.

[101] For carrying capacity figures, see Curtis K. Skinner, *et al.*, "History of the Bison in Yellowstone Park" [with supplements] 1952, typescript, various pagination, YELL; M.R. Daum to Theodore C. Joslin, 9 January 1929, YELL; and Meagher, *Bison in Yellowstone*, 32.

[102] Harlow B. Mills to Ben Thompson, 21 June 1935, Entry 34, RG79; Skinner, "History of the Bison in Yellowstone Park."

[103] Wright and Thompson, *Fauna of the National Parks* (1935), 59.

reparable damage in many instances."[104]

Regardless of the wildlife biologists' disapproval, live shipping remained a regular activity in the parks, as did slaughtering and occasional destruction of "outlaws." Yellowstone superintendent Edmund Rogers reported in late 1937 that 59 bison, including "some old animals that we wish to take from the herd," were being held for live shipment. The park planned shipments to the Springfield, Massachusetts, zoo; to an individual in Wolf Creek, Montana; and to Prince Ri Gin, in Korea. In addition, bison carcasses were intended to be sent to the Wind River Agency, in Wyoming, for distribution to local Indians. In Wind Cave National Park, where until the mid-1930s the Bureau of Biological Survey had been in charge of wildlife management, efforts were begun to reduce bison and elk to satisfactory numbers. The Service reported the following year that both Wind Cave and Platt national parks were reducing their bison populations, mainly by shipping carcasses to nearby Indian tribes.

These live shipments or distributions of carcasses may not have provided much political advantage, but the shipment of buffalo robes was at times partly intended to reap political gain. Recognizing this possibility, Director Cammerer wrote Secretary of the Interior Harold L. Ickes in 1936 that disposition of the hides "to friends of the Service and the Department, upon their special request, has been and will be helpful in maintaining a special interest in matters relating to this Department and the Service." In this regard, Yellowstone superintendent Rogers noted that requests for hides had been received from a number of persons, some of them highly placed, such as Senator Robert F. Wagner of New York, and Clyde A. Tolson of the Federal Bureau of Investigation.[105]

Animal Enclosures

Wind Cave and Platt shared another management practice with Yellowstone, in that these parks set up fenced-in areas for wildlife (particularly bison) to be viewed by the public. Only a few hundred acres in size, Platt had no choice but to build a display area for viewing bison, originally shipped in from a nearby wildlife preserve. The Park Service took over wildlife management in Wind Cave with fences already in place, and despite expressed intentions to remove the fences, continued to maintain an animal enclosure for the public's benefit.[106] As to Yellowstone's bison, Director Albright had stated in 1929 his determination to make the animals "more accessible to the visiting public." The problem as he saw it was how to manage the bison population "under nearly natural conditions and at the same time get it

[104] Specifically regarding elk, Wright cited the situation in Mount Rainier, where nonnative elk from Yellowstone had been transplanted–making it, in his opinion, "impossible ever to realize the restoration of the native Roosevelt elk to the park." George M. Wright to Arno B. Cammerer, 18 January 1935, Central Classified File, RG79.

[105] Edmund B. Rogers to the Director, 10 December 1937, YELL; *Annual Report of the Secretary of the Interior for the Fiscal Year Ending June 30, 1939* (Washington: U.S. Government Printing Office, 1939), 280-281; *Annual Report of the Secretary of the Interior* (1940), 180-181; Arno B. Cammerer to the Secretary of the Interior, 6 February 1936, YELL.

[106] Palmer H. Boeger, *Oklahoma Oasis: From Platt National Park to Chickasaw National Recreation Area* (Muskogee, Oklahoma: Western Heritage Books, 1987), 107, 111-112, 135-137; *Annual Report of the Secretary of the Interior for the Fiscal Year Ending June 30, 1935* (Washington: Government Printing Office, 1935), 198; Ise, *National Park Policy*, 584.

near the main highways where it can be easily and safely observed."[107]

Predictably, the biologists opposed enclosing park wildlife behind fences. In 1931, George Wright made his opposition clear to Albright, pointedly reminding the director that the purpose of park wildlife "does not end with their being seen by every tourist," and that people see many of these animals "when the circus comes to town." To Wright and his fellow biologists, an animal enclosure had the appearance of a "game farm" and was an inappropriate display of park wildlife to the public.[108]

Wright's position was reflected in Joseph Grinnell's remarks to Director Arno Cammerer in 1933, after Yosemite's fenced-in Tule elk herd (*not* native to the park) had been returned to their native habitat in California's Owens Valley. Keeping a close watch on Yosemite's wildlife management, Grinnell wrote Cammerer applauding Superintendent Charles Thomson's decision to remove Tule elk from the park. And, in reference to overall national park policy, Grinnell added that parks were not places "in which to maintain any sorts of animals in captivity," adding that it was the "free-living native wild animal life that . . . gives such rich opportunity for seeing and studying." Moreover, he took it for granted that maintaining free roaming wild animals was the Park Service's "general policy."[109]

However, Grinnell was mistaken as to the bureau's true policy on wildlife enclosures. Yellowstone's most ambitious effort to display bison came in 1935, only two years after Grinnell's letter to Cammerer, when the park established "Antelope Creek Buffalo Pasture," an approximately 530-acre tract south of Tower Falls in the northeast part of the park. Located along the park's main tourist road, the pasture accommodated about thirty bison and included a 5-acre "show corral," to assure visitors a chance to see the animals.[110] Remaining an important part of the park's wildlife display for several years, the Antelope Creek enclosure would be discontinued in the 1940s by Director Newton B. Drury—causing a heated controversy over the very policy issues that Grinnell and the other wildlife biologists had raised.

Predator Control.

The Park Service in the 1930s faced the problem of what to do with native predators—a matter of great concern to the wildlife biologists, who urged that the remaining predators be protected. Again, the Park Service's actions in this regard exposed internal disagreements over policy, and revealed difficulties which the biologists encountered in seeking to change traditional practices. Already by 1931, when Director Albright announced the policy of limiting predator control to that which was absolutely necessary, wolves and mountain lions (major predators which were believed to have kept populations of the more favored species reduced) were virtually eradicated from all national parks in the 48 contiguous states.

Accordingly, the new policy had only limited effectiveness. Of the triumvirate of carnivores most targeted for reduction by the Park Service in past decades (wolves, mountain lions, and coyotes), only the coyote remained in substantial

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[107] Horace M. Albright, "Our National Parks As Wild Life Sanctuaries," *American Forests and Forest Life*, 35 (August 1929), 507.

[108] George M. Wright to the Director, 19 December 1931, Entry 35, RG79.

[109] Joseph Grinnell to Arno B. Cammerer, 9 November 1933, Arno B. Cammerer files, MVZ-UC.

[110] Skinner, "History of the Bison in Yellowstone Park"; Rudolph L. Grimm, "Report on Antelope Creek Buffalo Pasture," (1937), typescript, YELL.

numbers, other than in the Alaska parks which had populations of wolves. And, despite the new predator policies, during most of the decade coyotes continued to be hunted, mainly on an occasional basis, and limited control of wolves was undertaken in the Alaska parks.[111]

Indeed, the 1931 predator policy itself reflected traditional biases against the coyote. Rather than a flat prohibition, the policy stated that there would be "no widespread campaign" against predators, and that "coyotes and other predators" would be shot only when they endangered other species. Thus, the policy did not totally eliminate predator control; rather it only restricted control (no "widespread" campaigns)—and it specifically identified the coyote as a potential target, the only species so designated. Moreover, at the 1932 superintendents' conference, a lengthy discussion of predator policy focused mainly on how to deal with coyotes. The consensus was that coyotes were to be subject to "local control"—i.e., reducing this species would be a matter of each superintendent's discretion. In fact, two biologists attending the meeting, Joseph Dixon and Harold Bryant, conceded that coyote reduction might at times be necessary.

By far, the strongest support for control of the coyotes came from the ranks of park management. Horace Albright wanted to control coyotes when they do damage to "more useful species." He particularly feared that antelope populations were threatened, and that without the current "intensive" control of coyotes, there would soon be no antelope in Yellowstone. Roger Toll, Yellowstone's superintendent, concurred. To Toll, a herd of antelope and deer was "more valuable than a herd of coyotes"; and he stated that rather than predators, the elk, deer, and antelope "were the type of animal the park was for."[112]

With support from leaders such as Albright and Toll, "wholesale coyote killing" (in the words of a Park Service report) continued in Yellowstone until the fall of 1933.[113] Earlier that same year, in Fauna No. 1, George Wright's team of wildlife biologists had declared a more rigid predator policy than before—perhaps a factor in easing Yellowstone's aggressive coyote control. As stated in Fauna No. 1, predators were to be "special charges" of the National Park Service, and would be killed only when the prey species was "in immediate danger of extermination"—and then only if the predator species itself was not endangered.[114]

In truth, the 1930s witnessed a decline in the killing of coyotes. Under the guidance of Sequoia superintendent John R. White, biologist Harold Bryant, and especially George Wright, the Park Service began to rely on "increased scientific data rather than ancestral prejudice" to address the predator issue.[115] In November 1934, Director Cammerer issued a prohibition of all predator control unless written authority was

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111 In 1945, Victor Cahalane recalled that the Park Service "practiced very limited control of wolves and coyotes in our Alaska areas from about 1932 to 1939 or 1940." Victor H. Cahalane to Mr. Drury, 14 March 1945, copy from the files of William E. Brown. See also Brown, *A History of the Denali-Mount McKinley Region*, 198.

112 Horace M. Albright, "The National Park Service's Policy on Predatory Mammals," *The Journal of Mammalogy*, 12 (May 1931), 185. Quotes from the 1932 superintendents' conference are found in National Park Service, "Policy on Predators and Notes on Predators" (1939), various pagination, typescript, Central Classified Files, 715, RG79.

113 National Park Service, "Policy on Predators and Notes on Predators."

114 Wright, Dixon, and Thompson, *Fauna of the National Parks* (1933), 147.

115 The quote is found in National Park Service, "Policy on Predators and Notes on Predators."

obtained from his office. Yet the following year, in Fauna No. 2, Wright and Ben Thompson acknowledged that coyote management was still controversial. They defined Park Service policy as allowing "judicious control of coyotes" to be undertaken in any park with the necessary authorization from Washington.[116]

Ongoing coyote control clearly demonstrated that these predators were not altogether "special charges" of the Park Service. Particularly in Yellowstone, efforts to reduce coyote populations continued, although apparently with less zeal after 1933. A matter-of-fact report in March 1935 revealed a cavalier attitude toward eliminating coyotes, as one ranger described how he discovered a pair of coyotes copulating "just at daylight," near lower Slough Creek; then (although aware that he had never seen coyotes do this before) he shot one of the animals dead.[117] By contrast, some Yellowstone staff doubted the wisdom of continued coyote control. In April 1935, Assistant Chief Ranger Frank W. Childs recommended that the park suspend the killing of coyotes for at least two years, with the intention of carefully studying the resulting effect on prey populations. Childs and others recognized the conflicts between, on the one hand, efforts to reduce elk populations, and on the other, killing predators that themselves were presumed to help reduce the numbers of elk. He suggested that scientific research might prove that discontinuing coyote control permanently would be best for the "general wildlife balance" in the park.[118] Evidence indicates that the park eased up on coyote control in 1935, but by 1937 considerable interest in further coyote reduction had developed.[119]

Pressure on the National Park Service to reduce its predator populations stemmed from several factors, including demands for protection of the spectacular game species so that they could be enjoyed in the parks (and hunted on lands adjacent to the parks), and demands for protection of livestock on adjacent lands. Concern for the game species and domestic livestock kept the Park Service under constant pressure from sportsmen's clubs and livestock growers associations to reduce or entirely remove major carnivores from the parks. In November 1935, Crater Lake superintendent David H. Canfield responded to the Southern Oregon Livestock Association's "sweeping condemnation" of predatory animals in national park areas. The association was particularly anxious about coyotes in the vicinity of Lava Beds National Monument (a park under Canfield's supervision); and Canfield stated that the wildlife problems of the area would be ad-

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[116] Wright and Thompson, *Fauna of the National Parks* (1935), 71.

[117] Curtis K. Skinner to Dr. Mills, 12 March 1935, YELL.

[118] Frank W. Childs, "Report on the Present Status of Wildlife Management in Yellowstone National Park With Suggested Recommendations for Future Treatment," 19 April 1935, YELL. There was also interest among Yellowstone's staff in restoring some of the park's extirpated species. Naturalist Assistant Harlow B. Mills wrote to Ben Thompson in 1935 that,

> As a policy I can see no great obstacle in the way of our, at least, attempting the introduction of cougar and wolves into the Park. They were a vital part of the picture at one time, a picture which can never be the same in the Park in their absence. This should be done, I realize, with considerable forethought and care, but I believe that it should be done, nevertheless.

Harlow B. Mills to Ben Thompson, 21 June 1935, Entry 34, RG79. Such interest would have been in accord with the recommendations of Fauna No. 1 that "any native species which has been exterminated from the park area shall be brought back if this can be done. . . ." See Wright, Dixon, and Thompson, *Fauna of the National Parks* (1933), 148.

[119] Murie, *Ecology of the Coyote*, 16; Sumner, "Biological Research and Management," 14.

dressed through scientific research. Subsequent research on coyotes in Lava Beds supported protection of these predators rather than control.[120]

The Park Service's policy for protection of predators, although flawed in its implementation, nevertheless contributed to sportsmen's associations and other groups opposing new national park initiatives for the Kings Canyon area in California and Olympic Mountains in Washington.[121] As elsewhere, such groups wanted the predators in these areas eliminated to protect game species. Resentment over the Service's policies motivated the California state legislature to petition Congress to force strict predator reduction in the national parks, but to no avail. This proposal would have been, in the words of Joseph Grinnell, who had long opposed predator control, a "calamity" to those "who see in national park administration the last chance of saving to the future entire *species* of certain animal groups." Viewing predators in an ecological context, Grinnell wrote to Arno Cammerer of the need to protect the "biotic mosaic" of each park, including predators. The Park Service should protect the whole "biotic superorganism uninjured—to the benefit of *all* its constituent species and populations" (emphasis Grinnell's).[122]

In addition to pressure from outside organizations, repeated recommendations that some predator populations be reduced came from within Park Service circles, such as from Horace Albright. Maintaining a keen interest in national park management long after he resigned from the bureau—indeed until his death in 1987—Albright seemed most alarmed about what effect suspension of coyote control would have on the spectacular grazing species, for instance antelope. Although Albright had established the Wildlife Division after George Wright had funded the initial wildlife survey, the former director was intensely interested in assuring public enjoyment of the parks' more popular animals, and he remained steadfastly loyal to the Park Service's traditional management practices.

Albright's letters to Director Cammerer on predators and antelope were strongly and plainly worded. In October 1937, the former director wrote that he deplored the ongoing, as yet inconclusive studies of the coyote's impact on Yellowstone's antelope population. He advocated "open war" on coyotes for the purpose of studying stomach contents to determine how much coyotes fed on antelope. In fact, he urged reducing the coyote population under almost any pretext, stating that, in spite of Park Service policy or the results of the studies of coyote stomachs, he would:

> continue to kill coyotes on the antelope range for the reason that the coyotes are of no possible advantage in that part of the park, can rarely be seen by tourists . . . while on the other hand there will always be danger of depleting the antelope herd. It must be remembered that one of the animals most interesting to tourists is the antelope. . . .

Albright also feared that, if protected, the coyotes would "over-run adjacent country," causing conflict

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[120] C.A. Henderson to David Canfield, 21 November 1935; and David Canfield to C.A. Henderson, 30 November 1935, Entry 34, RG79. Victor H. Cahalane, "Evolution of Predator Control Policy in the National Parks," *Journal of Wildlife Management*, 3 (July 1939), 236.

[121] David Madsen, Memorandum for The Director, 20 May 1939, Entry 36, RG79. See also Susan R. Shrepfer, *The Fight to Save the Redwoods: A History of Environmental Reform* (Madison: The University of Wisconsin Press, 1983), 61-63.

[122] Joseph Grinnell to Arno B. Cammerer, 10 April 1939, Central Classified File, RG79.

with land managers and owners outside of the park.[123]

When Albright made these remarks, the Park Service was beginning its most in-depth research to date on coyotes as predators. In line with recommendations from the wildlife biologists and from the park itself (such as ranger Frank Childs' suggestions), biologist Adolph Murie initiated in 1937 a study of Yellowstone's coyotes, at a time when there was renewed interest in predator control in the park. Murie's findings, entitled *Ecology of the Coyote in the Yellowstone*, were published in 1940 as the fourth in the Wildlife Division's "Fauna Series" (Fauna No. 4). His research indicated that coyote predation did not appreciably affect prey populations—having, for instance, only a "negligible" impact on elk populations. Murie noted that in view of the National Park Service's "high purpose" of preserving "selected samples of primitive America," the parks' flora and fauna should be subjected to "minimal disturbance." He concluded that coyote control was "not advisable under present conditions."[124]

Coming from one of the most outspoken Park Service biologists, Murie's conclusions drew severe criticism from those within the bureau who did not want to see coyotes protected. Indeed, there is indication that some individuals in top management wanted Murie fired.[125] Moreover, already aware of Murie's findings and the Wildlife Division's opposition to coyote reduction, Horace Albright wrote Cammerer in January 1939, reiterating his disagreement with the biologists. Believing there was nothing to be gained "either in wildlife management or in service to the public" by protecting the coyotes, Albright stated that, if not controlled very strictly, "powerful predators" such as the coyote were certain to menace the "more desirable species of wildlife." But despite the criticism, Murie's findings gained support from Director Cammerer, who opposed further coyote reduction. As Cammerer stated in his 1939 annual report, the coyote was a "natural and desirable component of the primitive biotic picture," not affecting the well-being of any of its prey species, and "not requiring any control at present"—words that sound as if they were written by Murie himself.[126]

Cammerer also noted in his 1939 report that Murie had begun long-range studies of the wolves in Mt. McKinley National Park. Public pressure for wolf control in McKinley (which resulted from fear that this predator was reducing Dall sheep and other popular wildlife populations) prompted Murie's study, which would extend into the early 1940s. As with the coyotes in Yellowstone, the Service sought to establish a scientific basis for its treatment of Mt. McKinley's wolves.

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[123] Horace M. Albright to the Director, National Park Service, 18 October 1937, Central Classified Files, RG79.

[124] Murie, *Ecology of the Coyote*, 146-148.

[125] Thomas Dunlap, in *Saving America's Wildlife*, 75, indicates that some Park Service officials "wanted to fire" Murie. Alston Chase, in *Playing God in Yellowstone: The Destruction of America's First National Park* (Boston: The Atlantic Monthly Press, 1986), 126-128, describes the "fierce Park Service resistance" which Murie faced during the coyote controversy. Lowell Sumner, in "Biological Research and Management," 15, recalled that, following the coyote study, "Murie's findings, and his personal concepts of ecological management of park resources, continued to be unpopular in various administrative circles." However, given that Murie was very soon assigned to a similar study of wolves in Mt. McKinley National Park, it is clear that he had support in high places, very likely from Director Cammerer himself.

[126] Horace M. Albright to A. B. Cammerer, 11 January 1939, Central Classified Files, RG79; *Annual Report of the Secretary of the Interior* (1939), 282.

Again, however, Horace Albright's comments on this matter revealed the differences between the wildlife biologists' recommendations and traditional Park Service attitudes. In his January 1939 letter to Cammerer, the former director stated that he found it "very difficult" to accept the idea of protecting McKinley's wolf population in the "territory of the beautiful Dall sheep." Albright believed the Park Service was taking a "grave risk" in spending so much time and effort caring for predators, a responsibility which in his opinion "does not or need not fall on the National Park Service at all."[127]

Writing to Cammerer in May 1939, Park Service biologist David Madsen reflected on the state of national park predator management near the close of the decade. Noting the ambivalence that still existed, Madsen observed that:

> In one breath we say that it is a good thing to have large predators present in the park to control what would otherwise be an over supply of our large mammals; and in the next breath we state that the large predators in particular the coyotes are not a factor in reducing the antelope in Yellowstone Park.

Madsen cited Adolph Murie's belief that the Park Service was troubled with "confused thinking" and did not have a "philosophical point of view" on predators. In part, Madsen attributed this indecisive attitude to a lack of scientific information, affecting all bureau personnel, both managers and biologists. He saw a "need for enlightenment" on the predator issue, to help the Park Service handle the "crossfire" between the scientists and such groups as sports-men and livestock owners.[128]

Although influenced by the wildlife biologists (who found support from park management at different levels, such as from Director Cammerer or Yellowstone ranger Frank Childs), the Park Service moved slowly and erratically during the 1930s toward a more scientific understanding of predator and prey populations and the discontinuance of predator control. Murie's work at Yellowstone and Mt. McKinley, and the coyote studies at Lava Beds, evidenced a willingness in the Park Service to use scientific research to address specific predator concerns. Nevertheless, as Madsen recognized, a strong ambivalence existed. The scientific perspective within the Park Service was countered by traditional biases which favored the popular game species over important carnivores, and by agitation from livestock owners' and sportsmen's organizations. Such pressure would continue to affect predator management in the national parks.

Fish Management

Similar to practices during the Mather era, the Park Service's fish management under Albright's and Cammerer's leadership was primarily intended to enhance sport fishing as a means of providing for public enjoyment of the parks. The Park Service took considerable pride in maintaining high-quality fishing in the national parks, even though it involved harvesting and consumption of native park fauna and the introduction of exotic species. In its management of fish, more than any other natural resource, the Park Service grossly violated known ecological principles. Yet so deeply entrenched was the tradition of fishing national park rivers and lakes that the wildlife biologists themselves

[127] Murie, *Wolves of Mount McKinley*, xiii-xv; Albright to Cammerer, 11 January 1939. Murie's wolf study is discussed in Brown, *A History of the Denali-Mount McKinley Region, Alaska*," 198.

[128] Madsen to the Director, 20 May 1939.

seemed ambivalent and did not categorically challenge management practices.

That these practices contradicted the idea of preserving park wildlife in its natural state was, however, clearly recognized. In Fauna No. 1, the wildlife biologists noted in a section suitably entitled "Conflicts With Fish Culture" that fishing in parks was an "important exception to general policy." Yet, granting the long-established fish management practices, they conceded that the benefits to park visitors overruled the "disadvantages which are incidentally incurred" by allowing fishing.[129]

Already, in 1928, five years before Fauna No. 1 appeared, the Park Service had detailed a biologist from the Bureau of Fisheries to become the Service's specialist in "fish culture" and coordinate with the Bureau in raising fish and planting them in park lakes and streams. The specialist was probably David Madsen, who by the early 1930s, was in fact working with the Park Service, on detail from the Bureau. Like his fellow biologists, Madsen recognized that the Park Service's fish management was "entirely inconsistent" with other wildlife policy. Yet as a fish culture specialist he predictably appreciated the popularity of fishing in the parks and stated that the sport should be "maintained and in some instances developed to the highest point possible in the interest of the visiting public."[130]

Moreover, in an effort to improve fishing elsewhere in the country, the Park Service regularly shipped fish eggs to areas outside the parks—thus its manipulation of fish populations and distribution extended far beyond national park boundaries. The Yellowstone Lake Hatchery was particularly active, shipping millions of native and non-native fish eggs to numerous states and some foreign countries.[131] In maintaining the sport for the visiting public, and in shipping eggs to areas outside of the parks, the Park Service continued Director Stephen Mather's policy of extensive reliance on expertise in the Bureau of Fisheries and the state game and fish departments—offices which shared the Park Service's interest in promoting sport fishing.

Early in 1935, just as Madsen was being converted to permanent Park Service employment, assigned to the Wildlife Division, he reviewed the fish cultural activities in the national parks. Madsen observed that in the past "other agencies" had run national park fish programs, and in fact often with very little direction from the Park Service. He wrote that the Bureau of Fisheries had managed fish culture in Glacier, Mount Rainier, Yellowstone, and Grand Teton, while state offices had overseen the work in the national parks of California, and in Crater Lake and Rocky Mountain national parks. However, the Park Service had recently begun asserting a greater voice in fish management, by using park rangers to do the planting (and by hiring Madsen), thereby assuming greater control over what species were planted, and where. But Madsen urged that the Park Service take charge of "all fish cultural activities" in the parks, in the same way that it oversaw other activities which were "properly the function of the Park

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[129] Wright, Dixon, and Thompson, *Fauna of the National Parks* (1933), 63.

[130] David H. Madsen, "A National Park Service Fish Policy," (ca. early 1930s), typescript, Entry 36, RG79; and Madsen, "Outline of a General Policy of Handling the Fish Problem in the National Parks," 10 May 1932, typescript, Central Classified File, RG79. The records do not indicate whether Madsen was first detailed to the Park Service in 1928 or in the early 1930s.

[131] John D. Varley, "Record of Egg Shipments from Yellowstone Fishes, 1914-1955," Yellowstone National Park, Information Paper No. 36, May 1979, YELL.

Service."[132] His greater concern seemed to have been to exert control over the fish programs, rather than change policy.

Nevertheless, although Park Service biologists seem to have voiced only limited opposition to fishing in the national parks, apparently not recommending banning fishing altogether, Madsen and the other biologists were largely responsible for the slight modifications in the Service's fish policy that did occur in the 1930s. As a fish culture expert who encouraged fishing in the parks, Madsen still acknowledged that "indiscriminate introduction" of non-native fish had adversely altered the natural conditions of park lakes and streams—a concern shared by the other biologists.[133] Fauna No. 1 contained clear recommendations to reduce populations of exotic species already present in the parks, and to prevent the invasion of other exotics. In addition, the report advocated setting aside one watershed in each park to assure "preservation of the aquatic biota in its undisturbed primitive state." No introduction of fish or fish food would be allowed in any of these watersheds, except as might naturally occur; and fishing would be permitted, but only if it did not "deplete the existing stock."[134]

Overall, since there was apparently no strong push to eliminate fishing and fish culture in the national parks, the concerns about exotic species and the recommendation to keep selected park watersheds in an "undisturbed primitive state" were the only factors likely to be affected by a policy change. Thus when Director Cammerer issued the National Park Service's first written policy for fisheries management (in April 1936, and almost certainly prepared by the biologists), it dealt primarily with the question of exotic fish species, and, to a lesser degree, the idea of leaving some park waters in their natural condition. That fish cultural activities would continue in parks was a given in the new policy—in fact, the document's introduction specifically stated that it was a policy for "fish planting and distribution." Still, the policy favored protection of native species, emphasizing that the intent was to "prohibit the wider distribution" of exotics within park waters. Among other points, exotic species were not to be introduced in waters where only native fish existed; and in waters where exotic and native fish *both* existed, the native species were to be "definitely encouraged."[135]

The new policy contained, however, significant deviations from the protection of native species and restrictions on exotics—deviations that left substantial options open to park managers and thereby reduced the degree of true change from earlier policy. Despite the concern about "indiscriminate introduction," stocking was allowed in waters previously barren of game fish, based on the Park Service's judgment whether or not a lake or stream was of "greater value without the presence of fishermen." And in waters where exotic species were "best suited to the environment and have proven of higher value for fishing purposes than native species," stocking of exotics could continue if approved by both the park superintendent and the director. Subsequently, Cammerer refined this last point in his 1936 annual report by specifying that native species would be "favored" in waters where such species "are of equal or

[132] David H. Madsen, "Report on Fish Cultural Activities," 5 April 1935, Central Classified File, RG79.

[133] David H. Madsen to Arno B. Cammerer, 6 October, 1933, Central Classified File, RG79.

[134] Wright, Dixon, and Thompson, *Fauna of the National Parks* (1933), 148, 63.

[135] Arno B. Cammerer, Office Order No. 323, 13 April 1936, Entry 35, RG79.

superior value from the standpoint of fishing."[136]

The new fish management policy thus allowed continued alteration of national park aquatic conditions for utilitarian purposes—i.e., the promotion of sport fishing and the enhancement of public enjoyment. As during the Mather era, fish management remained essentially commodity based, with stocking and harvesting on a massive scale. And the Park Service continued to plant exotic species in large numbers in such waters as Yellowstone's Madison, Firehole, and Yellowstone rivers in the years following issuance of the 1936 policy. In some instances, as at Mammoth Beaver Ponds in the Yellowstone River drainage, previously fishless lakes were first stocked about the time the policy was declared, and such stocking continued for years afterward.[137] Not even mentioned in the new policy, the shipment of millions of fish eggs (including both native and exotic species) from national parks to non-park areas continued undiminished throughout this period. Director Cammerer reported in 1937 that 20 million rainbow and Loch Leven trout eggs (both exotic species) were collected near Yellowstone's west boundary, with only one-fifth of them returned to park waters, the rest shipped elsewhere.[138]

Indeed, the Park Service's first detailed fisheries policy—which would remain essentially unchanged for two decades—had limited effect on fish management in the parks. Park Service biologist Carl Russell's remarks to the North American Wildlife Federation in March 1937 reflected the continuity in national park fish management when he asserted that the new policies would mean continued "maintenance of good fishing," and that the Park Service was "definitely" committed to fishing as a "recreational activity in parks." Similar observations came from other biologists. Victor Cahalane commented in 1939 that the Park Service deemed fishing to be acceptable because of the "readily replaceable nature of fish resources," and because sport fishing results in "recreational benefits far outweighing any possible impairment of natural conditions." But, evidencing the ambivalence among the biologists, Cahalane also stated that it was the Park Service's responsibility to address the contradictions "existing between use of fish resources and of other natural resources within the parks."[139] Due to

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[136] Cammerer, Office Order No. 323, 13 April 1936; *Annual Report of the Secretary of the Interior* (1936), 124.

[137] John D. Varley, "A History of Fish Stocking Activities in Yellowstone National Park Between 1881-1980," Yellowstone National Park Information Paper, no. 35, 1 January 1981, typescript, 9, 13, 17, 19, 21, 26, 52-53, YELL. The stocking of Mammoth Beaver Ponds took place in 1936, quite possibly in the months after the park had received the new fish policy, issued by Cammerer in mid-April of that year. In the case of McBride Lake, also in the Yellowstone drainage, exotic rainbow trout were introduced in 1936, where previously only native cutthroat trout existed. Varley, "History of Fish Stocking," 17.

[138] Varley, "Record of Egg Shipments"; *Annual Report of the Secretary of the Interior for the Year Ending June 30, 1937* (Washington: U.S. Government Printing Office, 1937), 44. As another example of fish production and shipment during the 1930s, the collection of approximately 60,000,000 trout eggs in one year from several unspecified national parks, with about half of them being shipped to various states, is mentioned by Cammerer in *Annual Report of the Secretary of the Interior* (1936), 124.

[139] Carl P. Russell, "Opportunities of the Wildlife Technician in National Parks." Paper presented at the North American Wildlife Federation conference, St. Louis, Missouri, 1 March 1937, typescript, HFLA. Victor H. Cahalane, "Thoughts on National Park Service-Bureau of Fisheries Agreement," draft, 4 August 1939, Entry 36, RG79. Cahalane accepted that the Service would continue its dependency on other agencies for fish culture work. And Director Cammerer had reported

the very deeply ingrained acceptance of angling in national park waters, however, the contradictions in fish policies would never be fully resolved. And with widespread acceptance of fish stocking and harvesting, as sanctioned by the 1936 policy, extensive manipulation of park fish populations and distribution to areas outside of the parks would continue long after issuance of the policy.

Protecting the Forests

Similar to fish management, the treatment of national park forests was at odds with known ecological principles. Nevertheless, traditional forest practices endured. The entire emphasis was on maintaining green, attractive forests, even though this policy was strongly challenged by the wildlife biologists, who wished to adhere to the current ecological principles which they articulated. The debates over forestry policies highlighted fundamental differences between the wildlife biologists and much of the rest of the Park Service, with the biologists' views of park management being far ahead of the times. The failure of their challenge to forest management showed the weakness of the biologists' position within a very traditional organization, and conversely, the considerable bureaucratic strength which the foresters were developing in the Park Service.

National park forestry operations expanded tremendously during the 1930s, receiving far more funds and support from the New Deal's emergency relief programs than any other natural resource management activity in the parks. So important was forestry in the overall work of the CCC that the organization was at times referred to as "Roosevelt's Tree Army." And, as the 1916 National Park Service Act itself had done, the 1933 act creating the CCC specifically called for protection of the forests. Among the CCC's other responsibilities, Congress mandated that it would protect the forests from fires, insects, and disease damage—goals which fit perfectly those of most national park managers.[140]

In his 1933 annual report, Horace Albright's comments on the initial work of the CCC foreshadowed the virtual explosion of national park forestry. The director stated that the newly established CCC crews were accomplishing "work that had been needed greatly for years," but which had been "impossible" under ordinary appropriations:

> Especially has the fire hazard been reduced and the appearance of forest stands greatly improved by clean-up work along many miles of park highways; many areas of unsightly burns have been cleared; miles of fire trails and truck trails have been constructed for the protection of the park forests and excellent work accomplished in insect control and blister-rust control and in other lines of forest protection; improvements have been made in the construction and development of telephone

in 1937, the year after the new fish policy was issued, that cooperation was closer "than ever before" between the Service and the Bureau of Fisheries and state game departments. Cooperation became even closer in 1940, with the transfer of the biologists to the Bureau of Biological Survey and its subsequent merger with the Bureau of Fisheries. Cahalane, "Thoughts on National Park Service-Bureau of Fisheries Agreement"; *Annual Report of the Secretary of the Interior* (1937), 44.

[140] John C. Paige, *The Civilian Conservation Corps and the National Park Service, 1933-1942: An Administrative History* (Washington: National Park Service, 1985), appendix A, 162. The National Park Service Act authorized the Service to "sell or dispose of timber in those cases where...the cutting of such timber is required in order to control the attacks of insects or diseases or otherwise conserve the scenery. . . . " Hillory A. Tolson, *Laws Relating to the National Park Service, the National Parks and Monuments* (Washington: U.S. Department of the Interior, 1933), 10.

lines, fire lookouts, and guard cabins; and landscaping and erosion control has been undertaken.[141]

Park Service forestry programs of the 1930s came under the direction of John Coffman, who had been hired from the U.S. Forest Service in 1928 and placed in the Division of Education and Forestry, supervised by Ansel Hall. That same year, with assistance from the recently established, multi-bureau Forest Protection Board, which the Park Service had joined, Coffman and Hall drafted the Park Service's first formal forestry management statement, declared official policy by Director Albright in 1931. And during the buildup of CCC-funded forestry programs in 1933, Director Cammerer designated Coffman the Park Service's "Chief Forester," in charge of the newly created Division of Forestry, separate from Hall's educational work.[142]

The 1931 forestry management policies promulgated by Albright provided guidance for the Park Service throughout the decade, and beyond. Under the new policies the park forests were to be "as *completely protected* as possible" against fire, insects, fungi, and "grazing by domestic animals," among other threats. This comprehensive protection was to be extended to "*all* park areas," such as those associated with "brush, grass, or other cover" (italics in the original).[143] The CCC provided the Park Service with sufficient manpower to implement these forestry policies. Armed with new policies and staffed by thousands of CCC enrollees, Coffman's forestry programs became an increasingly important force in national park operations during the New Deal era.

The forest management practices drew frequent and sometimes barbed criticism from George Wright and the other wildlife biologists. Central to the biologists' concerns were the various "pre-fire" protection activities. They objected to the Park Service building fire roads through natural areas, or clearing hazardous dead trees and snags which contributed to the fuel buildup and increased the possibility of fire (for example, the insistence on clearing storm-damaged and dead trees from the Andrews Bald research reserve in Great Smoky Mountains). Some national park areas were particularly affected by pre-fire development. On the North Rim of Grand Canyon, fire protection preparations by the CCC included improvement of existing roads; and construction of primitive fire-access roads and trails, lookout towers, warehouses, a fire cache, maintenance shops, residences, telephone lines, and water ponds.[144]

Significantly, although the Park Service established a Wildlife Division in the 1930s and (mostly using CCC funds) hired about 27 wildlife

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[141] *Annual Report of the Secretary of the Interior* (1933), 157.

[142] John D. Coffman, "John D. Coffman and His Contribution to Forestry in the National Park Service," n.d., 36-39, typescript, HFLA. Because of the CCC's heavy emphasis on forestry, Coffman was also given the huge responsibility for overseeing CCC operations within the national parks. However, in 1936 the director consolidated oversight of these operations with the Service's state parks assistance program (also funded by the CCC). This expanded office combining all CCC-related national and state park work was supervised by Assistant Director Conrad L. Wirth, leaving Coffman free to concentrate on directing forestry management in the parks, which continued to rely on CCC manpower and money. See Coffman, "John D. Coffman and His Contribution to Forestry," 44; Conrad L. Wirth, *Park, Politics, and the People* (Norman: University of Oklahoma Press, 1980), 118; and Paige, *Civilian Conservation Corps*, 39-40, 48.

[143] "A Forestry Policy for the National Parks," approved by Horace M. Albright, 6 May 1931, typescript, Entry 18, RG79.

[144] Stephen J. Pyne, *Fire in America: A Cultural History of Wildland and Rural Fire* (Princeton: Princeton University Press, 1982), 300.

biologists, the bureau did not hire plant biologists *per se*. Also, the Park Service foresters (not known as biologists or botanists, but as for-esters) were deeply influenced by the management practices of the U.S. Forest Service, particularly regarding control of forest fires, insects, and disease. With such forest protection concerns dominating Park Service thinking regarding plant life, the wildlife biologists were, by default, left to deal with many plant biology issues. And as evidence of their broad ecological interests, the biologists did not shrink from the task. Moreover, they advocated ecological-attuned forest management, placing them in direct conflict with Park Service foresters.

Indeed, the wildlife biologists were never in agreement with the forest management policies made official in 1931. Although forests were not the focus of Wright's initial wildlife survey, preserving natural habitat, including plants, was recognized as fundamental to successful park management. In direct contradiction to ongoing Park Service forestry practices, Fauna No. 1 declared that park forests should be left in a natural condition: "It is necessary that the trees be left to accumulate dead limbs and rot in the trunks; [and] that the forest floor become littered. . . ."[145] Nevertheless, the CCC programs provided funds and manpower for extensive clearing of forest underbrush and dead trees—and this clearing became of increasing concern to the biologists.

Among other clearing work, roadside clearing, a widespread practice in national parks, was intended as a fire protection measure, but was equally important, in the words of a Park Service manual, as a means "to improve the appearance of the immediate landscape of the main drive" through parks. A conflicting view came from George Wright, who wrote Director Cammerer early in 1934 of the need to consider "all sides of the question" regarding clearing of hazardous debris along park roadsides, including the concern for "wild life values." Wright realized that clearing dead limbs and trees affected habitat, and he urged that the Park Service "reconsider" and determine "exactly under what conditions and in what parks road-side clean-up is a benefit and to what extent it should be carried on." He also told Cammerer that the biologists had discussed this matter with park superintendents and rangers, and that it was "amazing to discover that there was anything but unanimity of opinion on the value of this work." Some superintendents and rangers recognized the impacts on natural conditions, while others believed cleanup did not help prevent fires.[146] Nevertheless, clearing was sufficiently accepted by the Park Service rank and file so that it remained a common practice in the parks.

An even stronger opinion than Wright's came from biologist Adolph Murie in the summer of 1935, during an extended debate over whether or not to clear a twelve-square-mile area on Glacier National Park's west slope, just north of McDonald Creek, an area covered with damaged trees as a result of a recent fire. With many of the trees only partially burned, the tract seemed ripe for another fire, which could spread to adjacent, unburned forests. A meeting in the

[145] *Fauna of the National Parks* (1933), 33.

[146] U.S. Office of National Parks, Buildings and Reservations, "Instructions for Superintendents of Eastern National Park ECW Camps and CW Projects Concerning Roadside Clean-up, Fire Hazard Reduction, Brush Disposal," Chapter IX, 3, Supplement No. 7 to *Forest Truck Trail Handbook* (Washington: U.S. Forest Service, 1935); George M. Wright to the Director, 28 February 1934, Central Classified File, RG79.

park in July provoked strong disagreement on the propriety of cutting and removing all of the dead trees, whether standing or down. The contentious debates reflected sharp divergence between the wildlife biologists and the foresters on fire protection and on overall national park policy and philosophy.

Following the July 1935 meeting in Glacier, Murie reported to the Wildlife Division in Washington his intense opposition to the proposed clearing. In a lengthy letter, Murie wrote that the burned area was still a natural area, and he questioned the desirability of "removing a natural habitat from a national park." With roads for trucks, bulldozers, and other equipment, the clearing operation would cause "gross destruction," which, he believed, would interfere with the normal cycles of forest decay and growth, creating instead a "highly artificial appearance of logged-off lands." The removal of the trees would reduce the area's organic material and its soil fertility, and would cause drying of the soil and increased erosion. Moreover, this large clearing project would be a precedent to justify "almost any kind of landscape manipulation" in the future. "For what purposes," Murie asked, "do we deem it proper to destroy a natural state?" His answer was that almost no purpose justified such destruction. He concluded his argument with an opinion surely unheard of in national park management before the wildlife biologists began their work under George Wright: "To those interested in preserving wilderness," Murie wrote:

> Destroying a natural condition in a burn is just as sacrilegious as destroying a green forest. The dead forest which it is proposed to destroy is the forest we should set out to protect.[147]

Murie's remarks were quickly challenged. Lawrence F. Cook, head of John Coffman's forestry operations in the western parks, had also attended the July meeting in Glacier. Cook found Murie's report "rather typical"—and took a directly opposite position, fearing the long-term loss of green forests. "Nature," he commented, "goes to extremes if left alone." He reported that "gross destruction" had been done by the fire itself, despite the Park Service's best protection efforts, which were carried out with trained employees working under professional plans and with good equipment. In addition to adequate detection, fire protection depended on "easy access" into the forests, and the "reduction of potential fuel" through clearing—both of which would result from the proposed work in Glacier. Cook anticipated a rapid recovery of forest growth, but only if the area was cleared of dead trees so it would not be burned over by another, more damaging fire. Seeking to protect the beauty of the forests, he also recognized that this part of Glacier was intensively used; it was seen, he claimed, "by more travellers than any other in the park." Thus, Cook argued that the question was not whether to allow nature to take its course in the national parks, but to what extent the Park Service "must modify conditions to retain as nearly a natural forest condition as possible for the enjoyment of future generations."[148]

In a separate memorandum to Coffman, written the same day, Cook reflected on his concern that the Park Service's foresters had been

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[147] Adolph Murie, memorandum for Ben H. Thompson, 2 August 1935, Entry 34, RG79.

[148] L.F. Cook, memorandum for the Chief Forester, Reply to Dr. Murie's report on the Glacier National Park Cleanup Project, 28 August 1935, Entry 34, RG79.

accused of being "destroyers of the natural." Their promotion of physical development for fire protection, such as truck trails and fire lookouts, and their efforts to clear forests of fuel hazards had been criticized not only by the biologists but by other Park Service officials, including some superintendents, rangers, and landscape architects. Cook insisted, however, that the foresters were seeking to preserve the "natural values" of the parks, while also providing for the "greatest use and enjoyment of the parks with the least destruction." He summed up his credo of national park management, and fire protection in particular:

> The parks have long since passed the time when nature can be left to itself to take care of the area. Man has already and will continue to affect the natural conditions of the areas, and it is just as much a part of the Service Policy to provide for their enjoyment as it is to preserve the natural conditions. There is no longer any such thing as a balance of nature in our parks—man has modified it. We must carry on a policy of compensatory management of the areas.

"Forest protection," he added, is a "very necessary part of this management"; and without protection, the Park Service faced the destruction of "any semblance of biological balance, and scenic or recreational values, as well as the forests with which we are charged." Certainly Cook's views prevailed within the Park Service. But, before any significant clearing could get underway in the area north of McDonald Creek, the huge Heaven's Peak fire swept through Glacier in 1936, drawing attention from McDonald Creek and likely meaning that the disputed cleanup was never completed.[149]

Indeed, the Park Service's biologists and foresters all believed they were seeking to preserve "natural values," which would allow for the "greatest use and enjoyment of the parks with the least destruction." But the two groups were operating from fundamentally different perceptions as to exactly what constituted "natural values," and what constituted "destruction" in national parks. Adolph Murie opposed the extensive alterations which resulted from the Park Service's fire protection methods employed before, during, and after fires. And in his letter on the proposed clearing in Glacier, he concluded that:

> My feeling concerning any of this manipulation is that no national park should bear the artificial imprint of any man's action of this sort. We have been asked to keep things natural; let us try to do so.[150]

Cook, by contrast, had written Chief Forester John Coffman that human modifications to national parks meant there was no longer a "balance of nature"—thus his argument for "compensatory management," including determined efforts to protect the forests. His compensatory management would also preserve the beauty of the forests, so important to the public's enjoyment of the parks. Cook's philosophy of national park management reflected the Park Service's forestry policies as well as its overall management practices. And with funds and manpower coming from the CCC program, the Park Service continued its intensive

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[149] L.F. Cook, memorandum for the Chief Forester, Re: Criticism of Forestry Recommendations by Other Technicians, 28 August 1935, Entry 34, RG79. Personal communication with Bruce Fladmark, Glacier National Park, August 1991, regarding clearing in the McDonald Creek area.

[150] Murie to Thompson, 2 August 1935.

protection and suppression activities, very much against Murie's wishes.[151]

The biologists' and foresters' different approaches to national park management were evidenced in disagreements over other aspects of forestry. Continuing practices of the Mather era as stated in the 1931 forest policies, both Albright and Cammerer supported aggressive war against forest insects and disease, regularly calling upon the Bureau of Entomology and the Bureau of Plant Industry for expert assistance. In his last annual report (1933), Director Albright noted that "successful campaigns" had been waged against insects in park forests, ending or reducing several major epidemics. The Park Service, he said, had sought to eradicate infestations of the bark beetle in Yosemite and Crater Lake, and the mountain-pine beetle in Sequoia National Park. Both Glacier and Yellowstone faced insect infestations of such magnitude that studies were being made to determine if control efforts were practicable. It seemed to Albright that the national parks were truly under siege from insects, as well as from disease. Among the many threats, the disease known as blister rust was "spreading rapidly," threatening the western parks. "Unless checked," Albright reported, it was "only a matter of time" before blister rust would invade the white pine forests of Glacier and the sugar and white pines of the California parks.[152] As with fire protection, the CCC provided the Park Service with funds and manpower to wage intensive campaigns against forest insects and disease.

Again, however, the wildlife biologists challenged these efforts. George Wright wrote Director Cammerer in August 1935 regarding use of the New Deal work relief programs to the greatest advantage, but he cautioned against too much "zeal for accomplishment," particularly in insect and disease control. Generally, the biologists directed their criticism toward widespread control efforts, while accepting limited control in and around park development. Wright would largely confine control to "heavily utilized areas" most frequented by visitors. The piñon pine scale infection in Colorado National Monument was, he pointed out, a natural phenomenon which seemed "best to leave undisturbed" outside of developed areas. Similarly, reporting on CCC work in Grand Canyon during 1935, Victor Cahalane commented that the Wildlife Division "disapproves of insect control, outside of developed areas," unless a native plant was threatened with extinction.[153]

Much more critical comments came from Adolph Murie, who, after a visit to Mount Rainier in 1935, strongly objected to the Park Service's disease and insect control. Murie acknowledged to George Wright that "possibly some effort" was necessary to save "certain outstanding forests." But he opposed extensive control, emphasizing that in its forest management the Park Service should not "play nursemaid more than is essential." Since beetles were native insects and ribes native plants (currants and gooseberries which serve as an alternate host to the blister rust fungus—the reason the foresters sought to eradicate

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[151] Cook to Chief Forester, 28 August 1935. In Cammerer's 1939 annual report, the director discusses fire prevention and fire protection work undertaken with CCC funds and enrollees. *Annual Report of the Secretary of the Interior* (1939), 272-275.

[152] *Annual Report of the Secretary of the Interior* (1933), 180-181.

[153] George M. Wright to Arno B. Cammerer, 1 August 1935, Entry 35, RG79; Victor H. Cahalane to A.E. Demaray, 23 September, 1935, Entry 34, RG79. For comments on CCC involvement in insect and disease control see Paige, *Civilian Conservation Corps*, 101-103.

ribes), Murie advocated leaving them alone and "permitting natural events to take their course" because "the cure is about as bad as the disease." Ribes were, in his words, "just as desirable in the flora as is pine," and Murie concluded that "justification for destroying a species in an area should be overwhelming before any action is taken."[154]

Arguments such as Murie's did not at all sway the foresters. In his letters to Coffman on fire management, Lawrence Cook rebutted the biologists' position and defended the Park Service's forest disease and insect control policies as an essential part of park management. Just as with fire suppression, the foresters believed that "some modification," including insect control, "is necessary to preserve for the future the living values of the parks." And indeed, forest insect and disease control continued especially strong while CCC money and manpower were available. Late in the decade, Director Cammerer reported on aggressive blister rust control and beetle eradication in a number of parks, noting the support of the Bureau of Entomology and that all control was carried out through the CCC program.[155] The termination of the CCC just after World War II began would drastically reduce the resources available to the Park Service for control work—but the policies remained in force.

Leadership in National Park Policy and Operations

During the 1930s, guidance of the Park Service's natural resource management had become the responsibility of two professions, forestry and wildlife biology, and they often clashed over the basic principles and the specifics of national park management. The wildlife biologists had found a voice in national park policy and operations, but so had the foresters, who were able to continue their practices despite the biologists' objections. Decades later, Lowell Sumner reflected that "even George Wright was unable to make much progress" in establishing more ecologically sound forest management.[156] Indeed, the biologists' criticism of various forest practices had little effect on the bureau's management policies—a reflection of the fact that the foresters' practices were not seriously questioned by Park Service leadership. The policies on forest fires, insects, and disease were aimed at maintaining the beauty of the parks and thereby enhancing public enjoyment, thus bringing the foresters much more into the mainstream of national park thinking than were the wildlife biologists. Moreover, the foresters were backed by CCC money and by the mandate of the act establishing the CCC, much less by the National Park Service Act itself.[157]

At the end of Cammerer's directorship and while the biologists' influence was in eclipse, the foresters

[154] Adolph Murie to George M. Wright, 26 March 1935, Entry 34, RG79. Similar statements regarding insect control are found in biologist Harlow B. Mills letter to Ben Thompson, 21 June 1935.

[155] Cook to Chief Forester, 28 August 1935; and *Annual Report of the Secretary of the Interior* (1939), 272-274. For similar comments made earlier by Cammerer, see *Annual Report of the Secretary of the Interior* (1937), 42-43.

[156] Sumner, "Biological Research and Management," 13.

[157] The utilitarian aspects of the National Park Service Act and the act's ramifications for national park management are discussed in Richard West Sellars, "The Roots of National Park Management: Evolving Perceptions of the Park Service's Mandate," *Journal of Forestry*, 90 (January 1992), 16-19; and Sellars, "Science or Scenery? A Conflict of Values in the National Parks," *Wilderness* 52 (Summer 1989), 29-38.

were truly in the ascendancy. The Park Service's official organizational chart, revised in mid-1941 (a year and a half after Interior Secretary Ickes transferred the wildlife biologists to the Bureau of Biological Survey), showed the Branch of Forestry with no less than three divisions: Tree Preservation, Protection and Personnel Training, and Administration and General Forestry.[158]

Furthermore, foresters entering the Park Service in the 1930s and subsequent decades were heavily influenced by the policies of the U.S. Forest Service; individuals such as Chief Forester John Coffman had worked with the Forest Service before employment by the Park Service. Also, many national park rangers who did not have the specific title of forester nevertheless had been trained in forestry at such schools as Colorado A&M College. The "ranger factory," which was just coming into being at Colorado A&M by the late 1930s and would flourish during the ensuing decades, trained young men to become national park rangers under a program administered by the forestry school.[159]

Altogether, an alliance was building between the Park Service's foresters and rangers (they would be combined organizationally in the mid-1950s). The strength of this alliance was bolstered by the fact that these two groups fed directly into top leadership positions, in charge of national park policy and operations. With an increasing number of forestry graduates attracted into the ranks of the National Park Service, the profession was evolving into one of the most influential in the organization. By the end of the decade (with the few remaining wildlife biologists transferred to the Biological Survey and Fauna No. 1's influence on national park management swiftly declining) the foresters' bureaucratic power had begun to rival that of the landscape architects and engineers under Thomas C. Vint and Conrad L. Wirth, whose authority had also been greatly enhanced by the New Deal programs.[160] Although not always in full accord, the foresters, rangers, landscape architects, and engineers formed the core of National Park Service leadership and would dominate national park philosophy and operations for decades.

[See page 109 for a key to the meaning of abbreviations used in the footnotes.]

158 Russ Olsen, *Administrative History: Organizational Structures of the National Park Service, 1917 to 1985* (Washington: National Park Service, 1985), 63. Under Coffman, the Park Service also provided considerable training in forest protection, including techniques in fire, insect, and disease control. In many parks, rangers, park naturalists, and maintenance staffs all received this training. John W. Henneberger, "To Protect and Preserve: A History of the National Park Ranger," 1965, typescript, unpublished manuscript, copy courtesy of the author, 307.

159 Tom Ela, interview with the author, 26 January 1989; Arthur Wilcox, interview with the author, 17 March 1992.

160 As an example of the growing strength of the forestry programs, a list of 137 professionally trained foresters in the National Park Service by 1952, shows most of them in key positions. Robert N. McIntyre, "A Brief History of Forestry in the National Park Service," March, 1952, Appendix A, typescript, BL. About eight wildlife biologists were transferred back into the Park Service around the end of World War II, yet Lowell Sumner later recalled that Fauna No. 1 itself became "forgotten." Moreover, the number of biologists did not increase until the 1960s. Sumner "Biological Research and Management," 16-17, 19.

This is the second of a three-part series, excerpted from Richard West Sellars' forthcoming history of natural resources management in the U.S. national parks. Part III will examine the wildlife biology programs in the context of the Park Service's growth and expansion in the New Deal era.

Abbreviations Used in the Footnotes

BL
Bancroft Library, University of California at Berkeley

GRSM
Great Smoky Mountains National Park Archives

Hartzog Papers
George B. Hartzog Papers, Clemson University

HFLA
Harpers Ferry Library and Archives, National Park Service

Kent Papers
William Kent Papers, Yale University Library

Leopold Papers
A. Starker Leopold Papers, Department of Forestry and Resource Management, University of California at Berkeley

MVZ-UC
Museum of Vertebrate Zoology, University of California

RG79
Record Group 79, Records of the National Park Service, National Archives

YELL
Yellowstone National Park Archives

YOSE
Yosemite National Park Archives

Authors in This Issue

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James W. Coleman, Jr. was appointed Regional Director of the Southeast Region of the US National Park Service in September 1991. For more than ten years prior to this appointment he served as Regional Director of the Mid-Atlantic Region. He began his USNPS career in 1958 at National Capital Parks and has served in a number of park areas since that time.

John Donahue is an environmental protection specialist with the US National Park Service in Washington, DC. He has also been a natural resource management specialist, an interpreter, and a gardener for the agency. He recently completed a temporary assignment as the Chief of Resource Management and Visitor Protection at Cape Cod National Seashore. Donahue has numerous publications on a wide variety of