

# Committee on Resources

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## Witness Testimony

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# TESTIMONY BEFORE THE U.S. HOUSE OF REPRESENTATIVES

## COMMITTEE ON RESOURCES

### SCIENCE AND RESOURCE MANAGEMENT IN THE NATIONAL PARK SYSTEM

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I am Frederic H. Wagner, Professor in the Department of Fisheries and Wildlife, Associate Dean of the College of Natural Resources, and Director of the Ecology Center, a 7-department, lateral program that coordinates research and graduate education in the science of ecology, all in Utah State University.

Before moving to Utah, I was a research biologist with the Wisconsin Department of Natural Resources. I have been at Utah State University over 30 years and have been professionally involved in a number of western-U.S., public-policy issues including a 5-year study of national parks. You may know of a book which I and 7 colleagues wrote entitled Wildlife Policies in U.S. National Parks, published in 1995 (Wagner et al. 1995). Two chapters in the book deal with science in the national parks and the National Park Service. Much of my research and writing in the past 10-15 years has been on the role of research in natural-resources management, the role of science in policy formation, and science ethics.

I will address four main issues in this testimony. First, science is, in my opinion, essential to effective management and protection of park resources, and to informed setting of policies that prescribe management and protection. Second, while there has been some good research in some areas of the agency, the Park Service has not overall had a strong tradition or commitment to the use of science in its operations. Third, because of this inadequate commitment, the quality of science and its use in policy have been spotty. In some cases it has been positive. But in others it has resulted in management decisions that have been detrimental to park resources. Fourth, I will comment on the pros and cons of different administrative arrangements for research in the National Park Service.

### Science is Essential to Effective Resource Management and Protection

I am sure the persons on this Committee are well aware that natural-resources systems are extremely complex, involving intricate relationships between water, soils, atmosphere, vegetation, animals, and climate. Appropriate decisions on effective management and protection depend on an understanding of that complexity that can only be provided by competent research.

A recent book by W.L. Halvorson and G.E. Davis (1996) describes the wide range of resource problems in a number of parks that could only be solved after years of research had provided a knowledge base on which to carry out effective management. Sophisticated air-quality studies showed that particulate emissions from the Navajo Power Plant in Page, Arizona were the main cause of the visibility problem in Grand Canyon. Vegetation research showed that periodic, low-intensity prescribed burns, like those set by Native Americans, rather than complete elimination of fire, is the proper management procedure to perpetuate the giant trees in Sequoia National Park. Studies on underground hydrology showed that sewage and toxic-waste pollution could be carried many miles underground to affect the water quality of surface streams in Ozark National Scenic Riverways and subsurface streams in Mammoth Cave National Park in Kentucky. And long-term research on the effects of angling on cutthroat trout in Yellowstone Lake showed that heavy fishing removal not only reduced the fish stocks, but also affected populations of osprey, white pelicans, and grizzly bears which feed on the fish. I am attaching my recent review of this book, now in press, to this statement.

Now while I believe that research is indispensable to rational policy setting and effective resource management, science does not, in my view, set policy or prescribe management goals. I consider these to be social and political processes the purpose of which is to satisfy societal values. I maintain that research in management agencies is a service to policy setting, and to the design and evaluation of management programs. It provides a knowledge base for informed policy setting and effective management. It enlightens these processes.

### **The National Park Service Has Not Had a Strong Science Tradition**

Following passage of the Park Service Organic Act in 1916, the agency has been heavily involved in carrying out its dual mission: protecting the resources "unimpaired for the enjoyment of future generations" and managing the flow of tourists who come to see these natural wonders. In the early decades of NPS history, simple protection was sufficient management of the resources, and the organization was largely staffed with landscape architects and ranger personnel who were well suited to carry out the dual mission.

But within a few decades, as the American population grew and developed economically, park resources began to be impacted from the outside by air and water pollution; by invasion of non-native plants and animals; and by encroachment of urban, industrial, and land-use expansion. And impacts grew on the inside by heavy tourist use, and by distortion of plant and animal communities from their pristine conditions. A 1986 survey of NPS employees (Anon. 1986) produced reports of 101 categories of threats to park resources. And academic researchers have published on the many external threats to parks (cf. Coggins 1987, Freemuth 1991).

It thus became evident to many observers that mere preservation was not sufficient management to protect the resources, that active management was necessary in many cases, and that a strong research program to provide a factual basis for effective management was needed. Recommendations to this effect began appearing in the 1930s, and have continued up to the present.

But with no tradition of science as an integral part of the agency's operations, or a significant cadre of employees with strong science training who had moved into the higher, influential administrative positions, the response to these recommendations has been weak at best. A 1992 National Research Council study (Risser et al. 1992) commented that there had been "a dozen reviews" of science in NPS since the early 1960s. All urged an expanded research program to provide a base of scientific information essential for capable management. But in the words of the NRC review, the response has been "abysmal."

In 1991-92, the research outlay was only 2 percent of the NPS budget. In 1993, when research in several Interior agencies was combined into the new National Biological Survey, the number of scientists transferred from the Fish and Wildlife Service was about 9 times the number from NPS even though both agencies manage roughly the same total area of land.

As one author pointed out (Haskell 1993), the limited research that had developed by the time it was moved to NBS was initiated at the grass roots, and not authorized from the top as a matter of policy. There had been no coherent research arm, separate budgetary line, or high-level research administrator.

### **The Weak Science Commitment Has Produced Spotty Research and Management Decisions**

The weak commitment to research and lack of formal policy made it difficult to produce consistently high-quality research. With no central policy and administration, research on natural resources was administered under Natural Resource Management with which it competed for funds. The section on Science and Research in the chapter on Natural Resource Management in the NPS 1988 Management Policies is only four sentences long. At the field level, research was administered out of the regional offices in some regions, by park superintendents in others. Without central direction, procedures, and standards for ensuring research quality, persons involved in research varied from highly qualified scientists to individuals with lesser credentials.

As a result of this lack of coherence, research quality varied. The 12 case studies discussed in the Halvorson and Davis book are examples of good science that has contributed to effective management programs which protect the resources. Research at the Beard Research Center in Everglades provided an excellent knowledge base with which to address the daunting management problems of that park.

But research on the ecology of elk in Yellowstone produced faulty conclusions that were the basis of the ill-conceived, natural-regulation management policy to which Dr. Kay has referred. This policy is generating overpopulations of deer in eastern parks and elk in the West that are ravaging the other resources in those parks. And in my opinion, you can place the Yellowstone bison problem that we are reading so much about in the press these days squarely at the feet of the natural-regulation management policy. Bad science produces bad management.

The weak mandate for science in NPS also makes it possible for some administrators to ignore it or act belligerently toward it when it is inconvenient, or to use it selectively to support policy positions. If research is to serve policy and management effectively, it must be free of coercion to seek truth regardless of where the chips may fall. It must have that freedom even if at times it produces results that are contrary to policy or indicates changes that are less comfortable than maintaining the status quo.

Administrators must then decide whether to change directions, or stay the course. If they apply pressures on researchers to produce biased science that supports present policy, or if they select only those findings that support current positions and ignore contrary evidence, it basically destroys the values and credibility of science.

While I don't suggest that such misuse of science has been the norm in NPS, there have been instances of it. Yellowstone and the natural-regulation policy has again been a case in point. That policy was greeted with skepticism in the wildlife profession from its inception in 1967. The skepticism was ignored by Park officials just as they have refused to recognize contrary evidence from recent research. And Park

researchers who generated contrary evidence were threatened with their jobs, transferred elsewhere, or denied access to the Park. Dr. Keigley, who has testified today with admirable professional restraint, is one example.

### **So What is the Best Administrative Structure for Research in NPS**

Since research in resource-management agencies is a service to policy setting, and to the design and evaluation of management programs, the question arises as to what administrative alignment with management allows it to serve most effectively. Several considerations bear on the answer, and these are a function of the personal and administrative distance between research and management:

1. Research must be relevant to management needs. Since research is a service to management, its practitioners must be close enough to management to understand the management problems and insure that their investigations are relevant to the solution of those problems. This argues for relative administrative proximity between scientists and managers.
2. Research must have the managers' trust. If managers are to accept research results and adapt their programs according to what is indicated by the latest findings, research must have the managers' trust. This is earned by the managers' recognition that the researchers understand the management problems, and are committed to helping solve them. This is another consideration arguing for personal and administrative proximity of research to management. If researchers are not known personally to managers, and/or they are situated at considerable administrative distance, it is much easier to ignore research recommendations.
3. Research must be free of political, policy, and bureaucratic pressures to seek objective truth without fear of administrative, personnel, and budgetary reprisal. There are instances where this has occurred in NPS, Dr. Keigley's example being one case in point. This consideration argues for administrative distance between management and research. Research should not be administered by the people who are making and administering policy.

Thus, there are arguments both for keeping research and management close together, and for distancing them. The question then arises as to what is the best compromise, and more specifically what is the best arrangement for NPS. I believe this is a major purpose of these hearings.

When we began writing our book on wildlife policies in national parks, we were prepared to recommend putting NPS research in its own, newly created division, with separate budget and administrative lines, and its own associate director. This was the structure in the Fish and Wildlife Service, and is the current situation in the U.S.D.A. Forest Service. But in October 1993 before we had finished our book and as everyone here knows, NPS research was moved into the new National Biological Survey and eventually into the Biological Resources Division of U.S.G.S.

I certainly do not think it should go back to its previous structure in NPS with the lack of a formal policy directing the use of research in management programs, and the disparate administrative status under which research operated. If it were restored to the agency, it should be in a discrete research arm with its own budget, administrative line, and administrator, and independent of park operations. And it should be expanded to provide a more adequate service to the parks than it did prior to 1993.

Its present position in U.S.G.S. now gives it the administrative distance it needs to allow it to seek objective truth without policy or bureaucratic pressures. Perhaps it should be left where it is for a while to give it a

chance to work. It has been a political football for nearly 4 years, and to uproot it and reposition it once again would just prolong the agony with the violence that does to the organization's morale and productivity. It has just recruited a new director who is moving to establish procedures and relationships.

I do think that if park research remains in the Biological Resources Division of U.S.G.S., there is a real need to develop formal liaison with the Park Service to insure relevance of the research to park needs. I also think there needs to be provision at top administrative levels in NPS to direct park administrators to consider and adopt research results in their management efforts.

And I agree that park superintendents should have a major say in what research is carried out in the parks. But I think there should be provision at the top for directing research that superintendents might not want out of concern for results that would challenge policy, but would clearly be relevant to enhancing the understanding of management and policy problems. There need to be safeguards against park superintendents refusing access to federal scientists proposing to do research relevant to park management problems, but for whatever reason inconvenient for the superintendents. The parks, after all, are public property.

Thank you very much for the invitation to present this information, and for your attention.

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