# *Science and the National Parks II*

## ADAPTING TO CHANGE

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United States Department of the Interior

NATIONAL PARK SERVICE
P.O. BOX 37127
WASHINGTON, D.C. 20013-7127

IN REPLY REFER TO:

A16 (001)
X N16

Memorandum

To: All Areas and Offices, National Park Service

From: Director, National Park Service

Subject: Science and the National Parks II - Adapting to Change

Attached is a copy of the August 12, 1993, National Park System Advisory Board report entitled "Science and the National Parks II--Adapting to Change." This report was prepared through the efforts of a working group which functioned as a subcommittee of the Advisory Board. The subcommittee was chaired by Mrs. Frances Seiberling Buchholzer. The working group which comprised the subcommittee was lead by Boyd Evison and Dr. Paul Risser of the Miami University of Ohio. Their purpose was to reconsider the recommendations of the National Research Council's "Science and the National Parks" report in light of the creation of the National Biological Survey and make recommendations to the National Park Service. They did a superb job in a very short time.

I have accepted these recommendations. I intend to act on them as quickly as possible.

I ask you to study this report carefully. Consider ways in which you may help the Service integrate these recommendations at all levels of the organization. I urge you to make thoughtful comments and suggestions and send them to Dr. Dennis M. Fenn, Acting Associate Director, Natural Resources. It is his job to lead us in accomplishing this undertaking.

I have already asked Dr. Fenn to prepare draft legislation that recognizes research as vital to the National Park Service and our mission. I intend to submit it to Congress soon.

Thank you very much.

Attachment

# *Science and the National Parks II*

ADAPTING TO CHANGE

*Science and the Parks* was a stiff, bracing injunction to better science on the part of the National Park Service, and a ringing endorsement of those in the Service who had done their best to achieve good science despite heavy odds.

The following members of the Science Program Committee have come to the aid of the Service and the nation by returning to the themes of that report, and giving practical suggestions for ways to get on with the work:

Frances Seiberling Buchholzer

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|---|---|
| Boyd Evison | Don Field |
| Paul Risser | Jane Lubchenco |
| Rob Arnberger | David Policansky |
| Kate Cannon | Andrew Ringgold |
| Norman L. Christensen | Thomas Ritter |

These people have done their task with admirable dispatch and equally admirable vigor. We must rise to their standard in what we do about their recommendations.

I congratulate the National Park Service people who showed how well and quickly we can move, and thank both them and the rest of the members of the working group for a job well done.

Roger G. Kennedy

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# *Preamble*

A sound, professional science program is essential to the successful achievement of the mission of the National Park Service (NPS).

The NPS response to a long succession of eminent advisory groups' recommendations for carrying out such a program has been spotty, at best.

Entering office within months of the issuance of the most current and thorough of those recommendations – *Science and the National Parks*, from the National Research Council of the National Academy of Sciences – Secretary Babbitt, Assistant Secretary Frampton, and Director Kennedy have given unprecedented emphasis to accomplishing goals clearly consonant with that document. Establishment of the group that produced the following report and recommendations is evidence of that emphasis. Assembled as the National Park System Advisory Board's Science Program Committee, the members were told to:

> Advise the Director and the Secretary regarding measures to be taken to assure that the full range of research, resource management, inventory, monitoring and information transfer needs of the Service are met in light of changes occurring since the NCR report, *Science and the National Parks*, was issued. The principal change to be evaluated is the creation of the National Biological Survey. The ultimate aim is to assure the highest level of effectiveness of both the National Biological Survey and the National Park Service.

We are convinced that the time to establish a sound, professional resource management science program that is deeply and irreversibly integrated into the NPS and the Department of the Interior is here, now.

- With slight modification to take advantage of the services of the NBS, the recommendations of *Science and the National Parks* are sound, and should be strongly endorsed, as the National Park System Advisory Board did in its resolution 109-7 of February 4, 1993.

- The program must be ecosystem-based and directed by a service whose managers – at all levels – are imbued with an understanding of ecological principles and of how to relate effectively with scientists.

- Employees having specific resource management responsibilities – and the products of their work – must have the level of professional competence that ensures their credibility in the science community and in court.

- The relationship that exists between the NPS, the academic community, and our many partners in conservation – local, regional, national, and international – must be truly symbiotic, built on interdependent action.

- The relationship between the NPS and the NBS should be the exemplar of such symbiotic relationships.

- Only the passage of a legislative mandate for resource management science in and for parks, keyed to the National Research Council's principles of "science for parks and parks for science" can give assurance of clear authority and genuinely lasting commitment to science-based management.

We strongly recommend that the director begin immediately with implementation of the recommendations that follow.

# 1

# ECOSYSTEM MANAGEMENT

The concept of managing in the context of entire ecosystems is critical to the long-term preservation of national park lands. Ecosystem management should become one of the guiding principles of national park management. Successful implementation of ecosystem management as a paradigm for managing our national parks will require improved integration of biological, physical, and social science concerns, an increased understanding and appreciation of the complex and dynamic nature of ecosystems, increased emphasis on bioregional planning, improved linkages between managers and scientists, and an effective mechanism for evaluating the "success" of management actions. It will also require improved credibility of NPS science managers, increased professionalization of park management, and the use of the best scientific data available. Specific recommendations include the following (others fall under the professionalization and partnership themes):

1. Recognize that ecosystem management (including the human dimension of ecosystems) is the guiding principle behind national park management.[1]

2. Acknowledge that ecosystem management (like all park management) should be viewed as a long-term experiment. Resource management decisions should be presented as hypotheses, with programs established to monitor their success in accomplishing the desired objectives. Management must adapt in response to new information.[1]

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NOTE: Throughout this document items marked with a **1** or **2** either (1) require no additional funding, or (2) require additional funding.

3. Increased emphasis must be given to addressing park resource issues in a broader context. Activities on lands outside of national parks can have significant ecological consequences in parks. Park management affects broader ecosystems, including their socioeconomic aspects. We must become more involved in jointly evaluating these issues in a bioregional, national, and global ecosystem management context with other interested parties. This will necessitate increased transjurisdictional cooperation.[1]

4. The NBS inventory and monitoring (I&M) program should utilize national park lands for developing protocols and focusing inventory and long-term monitoring efforts. National parks are the most extensive, permanently protected places in America, and thus have an intrinsically high value as representative "control" sites. They should thus form a cornerstone of any national I&M effort.[1]

5. The NPS should continue its emphasis on the approved 10-year inventory and monitoring program. An effective I&M program will be essential to effective long-term management of park ecosystems.[1]

# 2

# *PROFESSIONALIZATION*

The 1991 Vail Conference identified the need to professionalize the NPS workforce as one of the top priorities for the agency's future. The advent of the NBS in FY 94 will dramatically increase the importance of professionalizing the NPS resource management program. We simply must have more natural resource management staff, better trained, in more parks, as well as a few in regions and the Washington Office (WASO), if the NPS is to meet its stewardship mandate.

Although the FY 94 professionalization budget initiative will add a number of new resource management positions, it is only a first step. The additions called for were identified before the advent of the NBS. The NPS will need to carefully reconsider and prioritize its needs relative to the effects of the NBS once the structure of that agency has been fully defined. For example, the combined loss of the GIS division and the entire research staff to the NBS will leave the NPS with greatly reduced data management skills at the same time that increased quantities of increasingly sophisticated data can be expected to become available.

The following recommendations are designed to improve science professionalization in the NPS over the next several years:

1. Develop and give high priority to additional resource management professionalization initiatives for the FY 95 and FY 96 budget requests. These should identify additional highly trained positions needed to supplement current park resource management staffs.[2]

2. The professionalization budget initiatives should also reflect the need to replace some of the functional science management skills lost by the NPS when our researchers transferred to the NBS. In some parks and cooperative park studies units (CPSUs) as much as 50% of the individual researcher's time was spent on science management activities and liaison with non–NPS scientists. Many of these activities will now be left to park resource management staffs to accomplish. Large parks and clusters of small parks will need this expertise directly available to them. This function can

be served by "senior science managers," a concept that has been more fully developed in a paper from the Western Region.[2]

3. The professionalization budget initiatives should carefully consider and reflect the need for skilled, credible science managers in the Washington and regional offices to provide liaison to the NBS and to manage NPS needs for research information in the nonbiological arena as well as certain types of tactical biological studies that the NBS will not do for us. They will provide liaison with the NBS, university scientists, and various professional societies. These individuals should be recognized subject matter experts who will bring credibility to the NPS.[2]

4. The professionalization budget initiatives should carefully consider and reflect the need for developing the staff necessary to strengthen the NPS data management skills and capabilities. Full-time data management specialists must be made available to all large parks and clusters of small parks. Effective use of scientifically defensible data is the key to management effectiveness, and the NPS needs qualified data managers to provide those services.[2]

5. Whenever vacancies occur in natural resource positions at any level of the NPS, whether in the form of new positions or existing positions, the director should ensure that every effort is made to select persons with the finest skills and training possible. Such vacancies will provide an excellent opportunity for increasing the professionalism of NPS resource management.[1]

6. The director needs readily accessible advice from top-level, national stature scientists who understand the mission of the NPS. One or more rotating visiting senior scientist position(s) in the Washington Office, drawn from candidates from top universities and scientific organizations, would help accomplish this.[1]

7. The regional chief scientist positions will soon be responsible for a greatly increased share of the research-related expertise remaining in the NPS. These positions must be professionalized to the point where they have the reputation and credibility to take effective roles in providing liaison with the non-NPS scientific community.[1,2]

8. Resource management specialists assigned to park resource management science divisions should, wherever possible, be assigned professional series titles (e.g., wildlife biologist, aquatic ecologist). This will recognize the increased professionalism expected of these individuals and divisions.[1,2]

# 3

# PARTNERSHIPS AND LINKAGES

Effective preservation of national park resources will require greatly increased coordination and interaction with universities, scientists, professional societies, and other outside entities.

The following are specific recommendations to facilitate improvement of such partnerships and linkages:

1. Relationships with professional scientific societies must be improved. Specific examples include:

   - Develop a memorandum of understanding with the Ecological Society of America (ESA) on ecosystem management. The ESA Sustainable Biosphere Initiative Office (SBI) currently has such agreements with the Bureau of Land Management and Forest Service. This mechanism could serve as a means of improving communication, providing a source of peer review, educating managers through joint workshops and training activities, and involving outside scientists in the analysis of park management issues, and it would recognize and complement the role of the NBS. Jane Lubchenco, president of ESA, has strongly endorsed such a concept.

   - Pursue similar official relationships with other professional societies with interests relevant to the NPS.[1]

2. A mechanism should be developed to provide incentives for NPS managers and scientists to attend scientific conferences and symposia and to become increasingly involved in other activities of professional societies and organizations. Acquaintance with the work and abilities of "outside" professionals, and recognition as park science professionals, will markedly increase the value of NPS managers and scientists.[1]

3. The "parks for science" concept from the National Research Council's *Science and the National Parks* should be emphatically

endorsed. This is important to help overcome the image that national parks are not receptive to outside research, as well as to help ensure that the data to ensure the long-term preservation of park values and ecosystems will be available when they are needed. The knowledge to be derived from protected areas is, itself, a resource of inestimable value.[1]

4. The success of the NBS in serving the scientific needs of the NPS will be determined, in large part, by the effectiveness of information exchange between the two agencies. It is recommended that a specific mechanism be established that ensures such exchange.[1]

5. The NBS should establish a competitive grants program to encourage creative and innovative science that is relevant to national park management and conservation biology issues. The NPS must be a partner in such allocation decisions.[1]

6. At least until passage of an NPS science act (see chapter 5) and/or selection of a chief scientist, the Science Program Committee of the National Park System Advisory Board should be continued as a mechanism for providing continuing advice to the director on science and resource-related issues, including evaluation of the NPS science program.[2]

# 4

# *Interface between the National Park Service and the National Biological Survey*

The success of both the NPS and NBS in accomplishing their missions depends in large part on the effectiveness of their mutual communication and collaboration. Every effort must be made to enhance effective collaboration between the two agencies. The NPS must clearly articulate the types of information and services it requires from the NBS. At the same time it must ensure that it provides the NBS what it needs to do its job. The NBS must recognize that it is inheriting some long-standing programs and relationships that are critical for the long-term management of national park lands and that these must be continued and strengthened. Assessment of the success of both agencies in accomplishing their missions should be a cooperative effort.

The following recommendations are designed to help ensure that communication and collaboration between the NPS and NBS are as effective and mutually beneficial as possible:

1. The director should ensure that there is a clear definition of the roles of the two agencies in identifying research needs, acquiring funding, soliciting investigators, and reviewing, interpreting, and applying results. The roles of the two agencies in developing and implementing inventory and monitoring programs must also be clarified.[1]

2. A mechanism must be established immediately that ensures that parks with resident research scientists continue to provide space and logistical and administrative support for NBS scientists. The director of the NPS or the secretary of the Department of the Interior should mandate that traditional services be continued. A close cooperative relationship at the park level is critically important in avoiding any tendency to make important

management decisions without full consideration of the best obtainable data.[1]

3. In order to complement the biological research to be provided by the NBS, the NPS should strive to increase its science program breadth by adding physical and social science expertise, led by professionals in those fields. This would enable a more thorough "ecosystem" approach to NPS-related research.[2]

4. The NPS should request that the NBS ensure one or more persons at each co-op unit and ecoregion office have full-time responsibility for providing liaison with NPS units.[1]

5. Recognizing that the relationship with the NBS represents a new way of doing business, it is important that a mechanism be developed to assess the progress and effectiveness of NPS/NBS science accomplishments. This will help the NPS address how effectively it is accomplishing its mission.[1]

6. In order to clarify the meaning of the many potentially confusing terms used in discussions with the NBS (e.g., ecosystem, monitoring, tactical research) the NBS should maintain a glossary of terms that the NBS plans to utilize.[1]

7. A mechanism should be developed to encourage the utilization of NBS expertise in the NPS resource management planning process (e.g., scoping sessions at parks, scientific review of draft resource management plans).[1]

8. The director should support the concept that the NBS use an interagency committee to help guide and advise the NBS in such issues as policy and priority setting. The NPS must have strong, high-level representation on this committee.[1]

9. The NPS needs to ensure that legislation authorizing the NBS specifically addresses the need to provide for the research needs of the NPS.[1]

10. The NPS should encourage the NBS to establish separate programs to address research needs on the following levels:

    - National Level – Identify impacts/benefits to national park system areas in a general sense.

    - Ecosystem Level – Deal with research needs of all land managers within the ecosystem.

    - Unit-Specific Level – Identify research issues as part of a park's resource management plan. A portion of the funds in this

category should be devoted to "rapid response" research that may result from sudden unplanned needs, as well as small ticket items of programmed research identified in resource management plans.[1]

11. NBS scientists must be made to feel that an important part of their mission is to ensure the protection of resources and natural processes, unimpaired within the national park system for public understanding and enjoyment, and for the knowledge latent in them. In this manner, NBS scientists will be better able to coordinate/interact (i.e., represent the NPS) with other agency people.[1]

12. Whenever possible, research in national park system areas should include a "cooperative effort" where NPS biologists or managers are included as part of the study. In this way the managers assist with various aspects (e.g., logistical assistance, negotiations regarding minimum-impact research, issuance of permits, participation in data collection) of the study so that they know what has transpired throughout the project. This will help the managers to better implement management recommendations from the study as well as establish liaisons that should be of continuing value to the parks.[1]

13. The NBS should be encouraged to have NPS people (e.g., resource management specialists, GIS technicians) stationed at the co-op units.[1]

14. Make sure that NBS scientists are included in training that is provided to resource management organization personnel and NPS managers during their "professionalization" process.[1]

15. A mechanism needs to be developed with the NPS to establish priorities and associated rationale for needed research. The NPS will need to clearly articulate its needs if it is going to expect to have a significant influence on NBS decision making.[1]

# 5

# A Legislative Mandate for Science in the National Park Service

Although it may be said that the NPS has the authority to "do" science without a specific legislative mandate, the Science Program Committee is firmly convinced that one is needed – now more than ever.

It is clear that many of the National Research Council's 1992 recommendations (*Science and the National Parks*) would not have been necessary had the NPS previously established an adequate science and technology program and organization. Unfortunately, it had simply never done so, in spite of repeated authoritative urging. There is no assurance that it will do so now, on a long-term sustained basis, without statutory direction. Administrations come and go. The law persists.

It would be easy – but also *incorrect* – to assume that: (a) all NPS research needs, or even science needs as more broadly defined, will be met by the NBS and other agencies; (b) a legislative mandate for science in the parks will infringe on the role and responsibilities of the NBS; (c) such legislation would involve amendment of the NPS organic act; or (d) such legislation would constitute inappropriate and unneeded congressional intrusion into NPS management.

The legislation drafted in January 1993 by the NPS Office of Legislative and Congressional Affairs, with minor revisions, satisfactorily addresses these concerns.

Although much of the biological research needed for proper stewardship of NPS natural resources will be provided by the NBS, it will *not* meet the NPS needs for research in the fields of cultural resources, physical sciences, social sciences, or even the inventory of some portions of the parks' biological resources.

The NBS cannot be expected to provide NPS managers with liaison to the broader scientific community, nor with regular and detailed input into NPS planning, partnership arrangements, or operational decision

making. Nor is the NBS designed to provide the NPS with the sound, professional resource management programs and organization essential to meeting its stewardship responsibilities. Such functions will remain the responsibility of the NPS to provide for itself. It should be clear, therefore, that the NPS must have a strong science program even after the creation of the NBS. Some of the research programs are now within the NBS purview, and the NPS must not compete with this mission, but we must retain and/or build a stable and productive science program.

Through this proposed legislation the NPS and the Department of the Interior would be *inviting* statutory institutionalization of a function that is profoundly needed. This legislation would give lasting assurance of:

1. Recognition of the importance of parks as benchmark areas, where research benefiting from sustained assurance of the highest attainable level of integrity of ecosystems and cultural resources can and should be conducted. This – called "parks for science" in the NRC's *Science and the National Parks* – is an easily slighted but profoundly significant reason for protecting park resource integrity.

2. Periodic review and advice by an independent board of scientists and managers to help ensure a high level of professionalism, reliability, and legal defensibility of research, resource management, inventory, monitoring, and information management by and for the NPS.

3. A continuing commitment to mission-oriented research for the NPS.

4. Clear authority to establish and support CPSUs.

5. Authority to make grants for research.

The proposed legislation would, in fact, give strong, continuing assurance of NPS cooperation with the NBS in the accomplishment of its mission.

The proposed legislation would not amend, nor open to manipulation, the NPS organic act.

The committee has edited a copy of the draft legislation and has suggested minor changes to help clarify its purposes and to ensure recognition of the importance and role of the NBS.

The committee considered – and rejected – as a permanent *alternative*, recommending issuance of a secretarial order mandating these measures.

Making sound, professional, defensible science a fully integrated institution of the NPS should not be left to a device that can so easily be altered or withdrawn. However, issuance of such an order, as an *interim* measure pending passage of the legislation, would be beneficial.

Recommendation:

1. The director should instruct the Office of Legislative and Congressional Affairs to draft a final version of an NPS science bill for inclusion in the NPS legislative package for FY 94. The bill should be submitted to Congress as soon as possible and actively supported by the Department of the Interior.



U.S. GOVERNMENT PRINTING OFFICE 1993—839-570



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

Publication services were provided by Ruth Eitel, visual information specialist, Jon Nickolas, editor, and Mary Ryan, visual information technician, of the Branch of Publications and Graphic Design of the Denver Service Center. NPS D-899, September 1993

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