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COLLEGE OF NATURAL RESOURCES
DEPARTMENT OF FORESTRY AND CONSERVATION
DEPARTMENT OF FORESTRY AND RESOURCE MANAGEMENT

BERKELEY, CALIFORNIA 94720

July 13, 1977

Mr. William Whalen, Director
National Park Service
Interior Bldg.
Washington, D. C. 20240

Dear Bill:

Last fall some time Gary Everhardt asked Durward Allen and me to look into two matters: (1) the status of the Natural Science Program, and (2) problems of managing bears in national parks.

Enclosed herewith are our comments on the Natural Science operation. Suggestions on bears will come along one of these days, probably in August.

Congratulations on your new post! We look forward to working with you.

Sincerely,

A. Starker Leopold

ASL:na
cc: D. Allen
D. Schwartz

encl.

July 12, 1977

Memorandum to the Director of the National Park Service

From: Durward L. Allen, Council, National Parks Advisory Board

A. Starker Leopold, National Parks Advisory Board

Re: A review and recommendations relative to the NPS Natural Science Program.

Per the request of Director Everhardt, we have used available time in the first half of 1977 to appraise the structure and functioning of the Service Natural Science Program. Following, we submit summary recommendations and a discussion of measures considered appropriate for consideration by you and your administrative staff.

This review is addressed to immediate needs and makes no attempt to compile a history of policy and operations in the natural science field. We are sure that you share with us the outlook that (1) an effective science program is vital to the accomplishment of National Park Service missions, (2) it must be structured and staffed to serve management, resource preservation, and public service needs efficiently, and (3) the time is right to establish natural science functions and research as a firm, better recognized, and dependable adjunct to operations of the National Park Service.

We find no major fault with the science program, except that it is inadequate to meet its implied responsibilities. Considering its modest level of staffing and funding, it has been surprisingly productive and progressive. One evidence of this is the excellent series of recent research publications. Another is sponsorship in the past year of two outstanding conferences: one on research in the national parks at New Orleans in November

1976 and the other on bear management at Kalispell, Montana, in February 1977. The number, variety, and management pertinence of papers given at New Orleans and at Kalispell was a revelation to nearly everyone who thought he knew something about National Parks research. The publication of these symposia will make available valuable documents on natural resources under NPS administration. The manner in which these conferences were planned and carried out bespeaks a staff capable of the highest order of scientific leadership.

As used in the National Park Service, we take natural science to mean the collection and dissemination of scientific information. It includes a primary responsibility for research and advisory services to the Director and his administrative staff. Scientists make recommendations on technical matters, help create management policy, and represent the Service, when appropriate, in the scientific community.

We are impressed by a general concurrence among managers and scientists alike that research in this land-holding agency must be strongly oriented to the problems of resource preservation and management. Such fact-finding is fundamental to the master-planning process. It forms the basis of environmental conservation, and by a constant updating of interpretive information it enhances visitor experiences in the parks. It can help defend the agency and the public interest against increasingly popular and often frivolous tort claims. Constant monitoring and scientific oversight can guarantee a responsible custodianship by the National Park Service of unique natural areas and living things that may not be found in any other category of public land.

We admit to little concern about questions of "applied versus basic research." Major projects funded wholly or in part by the National Park Service

will usually have important management objectives and applications. But they will inevitably be involved with basic (i.e., "pure") science -- which means that they will find out some things for which no one sees an immediate "practical" use. This is an expected bonus that will eventually pay off somewhere. It does not mean that someone is wasting funds on visionary projects. A research scientist who does not have his eyes open for any kind of new information would not be a credit to the Service.

Lastly we wish to reiterate that this memorandum is intended only as a general overview of the program by two sympathetic and deeply involved outsiders. It is by no means a detailed task force analysis, which perhaps might well be called for five years hence when the research program has grown and matured a bit more.

Summary Recommendations

The following points are proposed as essential to a viable and productive science program in the National Park Service. No attempt has been made to establish priorities.

1.) Natural Science Program should be a line item in the budget, and each Region should have a dependable budgetary base for this function. The natural science budget, most notably for research, should be doubled within the next two years if possible, and doubled again within five years. Its adequacy should then be reappraised.

2.) In the Washington Office we recommend the establishment of a position of Associate Director for Natural Science. This would include the Office of the Chief Scientist, who would be the same individual. This would give the Natural Science Program a position comparable to that of Archaeology and Historic Preservation and also the stature it needs in the scientific community at large. It can serve the Director and his deputy to better advantage at this level in the administration.

3.) The Chief Scientist should advise the Director on matters pertaining to natural resources management in the parks, and the research required to guide such management. He should recommend service-wide policies in this field and be prepared to furnish constantly updated information on sensitive issues concerning resource management and public safety. Regional Chief Scientists should perform the same functions for the Regional Director and transmit appropriate information to the Chief Scientist, WASO.

4.) It should be a standing principle that in their technical functions scientists should be supervised by their professional peers. There should be a line relationship of this kind from the Chief Scientist, to Regional Chief Scientists, to staff scientist, to personnel in cooperative study units, field laboratories, and staff or contract scientists in the parks. In short, natural science research workers in a region should receive technical supervision and funding (including contracts) from the Regional Chief Scientist. This will provide the kind of quality control assistance most needed by Park Superintendents and Regional Directors, who have ultimate responsibility for all decisions and to whom sensitive issues should be referred.

5.) Whereas technical supervision of research design and execution is the responsibility of the Regional Chief Scientist, the Superintendents of individual parks should exercise administrative control over all scientific activities, including research in their respective parks. They should issue necessary permits for collecting and the use of facilities and decide on matters of staff cooperation. The need for special management reports should be agreed upon among the researcher, the Superintendent, and the Regional Scientist or his representative.

6.) Research proposals needing NPS funding or higher administrative approval should routinely originate with park Superintendents and be transmitted to the Regional Office. The Regional Chief Scientist should set up a priority list. According to the research funding base and any increases requested, the Regional Director can then

submit his science and research budget to WASO. The Chief Scientist is in a position to perform similar services for the Director, including coordination among Regions and giving a national perspective to the budget.

7.) In many of the larger parks there will be increasing need for Resource Management Biologists to help the Superintendents interpret and apply the knowledge derived from research projects.

8.) Location of the Natural Landmark and Theme Studies Division at the Denver Service Center appears advantageous. However we believe that technical direction of these programs should come from the Office of the Chief Scientist.

Discussion

One can not visit many parks and discuss problems with many superintendents without engendering a deep impression: These men, whatever their personal interests or professional training, have a many-faceted and demanding job to do. They must manage resources and increasing numbers of people, and they know they need facts on which to base and defend their actions. Superintendents are asking for more studies of unknowns in both natural and social science fields; they also need authority to do things that often are controversial -- fire management being an outstanding example.

As a result of many years of study and experimentation, the role of fire in wilderness preservation and the techniques of controlled burning are well understood in the West. In the east, this program is just beginning, but the need is there. Shenandoah National Park should use fire in maintaining the Great meadows area (in grass since prehistoric time), and fire could be used for economical vista maintenance. The park should have formalized studies and

authority to go ahead with experimental fire management. There is also need for research on bear habits, habitats, and visitor relationships. Shenandoah is used as an example because it has a higher per-acre rate of back-country visitor use than any other park in the country, yet the park never has had a funded project from NPS Natural Science Research Program.

Our sampling has been inadequate to justify a detailed analysis of research deficiencies in the National Park Service. But deficiencies are widespread and, on the whole, surprising. In the Rocky Mountain Region a research questionnaire was sent to all Superintendents, and from many of the smaller parks and monuments came expressions of frustration and anger that requests for research were almost universally denied. The existing science program is largely a function of the larger parks, but research needs on some of the small units are in fact equally great. We note with satisfaction that there is a growing realization of research needs, and steps are being taken to remedy the situation.

Our estimate that the total research effort should be doubled in two years is based on a consideration of what might logically be possible. From what we have seen, it appears that, country-wide, research should be multiplied by a factor of 4 or 5. Since this is indeed an estimate, we recommend another appraisal after a major increase has been assimilated. The main criterion would be whether park Superintendents with natural areas to manage, large or small, are getting the services they need.

The science-management interface

Not only is there still a major deficiency in the research effort in national parks, but there is shortfall also in the extent to which existing information is being applied. This results mainly from personnel cuts since the early 60s, the reasons for which are commonly known: the need to rob old parks

to staff new ones, and major increases in visitation. While this report is concerned with the science program itself, we can not ignore the problems of getting information applied.

Parks with large natural areas and important wildlife resources to manage are in need of technical assistance in the management staff of the Chief Ranger. The position that could fill this need might be described as a Resource Management Biologist -- preferably a person with research experience and at least MS training. This position could provide valuable liaison between research people working in a park and the ranger staff, who must sometimes carry out such functions as trapping and moving bears, controlled burning, managing fish and fishing, and similar functions. It is counterproductive to expect research workers to assume responsibility for such management operations, nor have we found a superintendent who wants ranger jobs handled in this way. A Resource Management Biologist could provide the technical know-how and leadership that ranger teams with special training should have available. He could help coordinate the logistic support of research people in the park, and he could keep records needed by the Superintendent on such critical matters as bear incidents and public safety.

We realize that there are Civil Service complications to the establishment of a scientist position of this kind -- but personnel standards and regulations should be kept up to date according to changing times and needs of the program. A Resource Management Biologist should have eligibility for promotion in any direction according to his qualifications. The need for a scientist promotion ladder in the Service has often been recognized, and we subscribe fully to this ideal. In addition to the above, there should be free promotional interchange between the interpretive staff and the science heirarchy, and from the field to the front office.

A field position that commonly was lost in the staff-cutting of the 60s was that of Chief Naturalist. The "overview report" of the National Parks Advisory Board in 1971 gave emphasis to the need to restore this position in many parks, and to some extent this has been done. However, many large units of the system are still without a Chief Naturalist, and they are much in need of such services. A primary purpose is to improve interpretive programs for the enhancement of visitor experience. However, we also wish to encourage a return to the inventory and publications work that formerly were traditional for scientists in this position.

The Chief Naturalist, as well as the suggested Resource Management Biologist, can assist the Superintendent in formulating resource management plans, developing research proposals, monitoring research activities, and advising on technical matters. The Chief Naturalist would, of course, supervise the work of seasonal naturalists -- who should have such a title. The general designation of technician is unsatisfactory to young professionals seeking identity in their chosen fields.

Funding and supervising research

We recommend that Natural Science and Research be identified as a separate recognizable item in the budget sent to Congress. Allocations to the regions must, of course, be subject to adjustment in the Director's office, but each region should have its base budget. Stability in funding of the science program is a major need of Regional Directors. We recognize that the Service is on its way toward some of these mechanisms. To our knowledge the Southeastern and Western Regions now have base budgets, but this should be uniform throughout the Service.

In the regions, science and research money should follow the technical supervisory and contracting authority of the Regional Chief Scientist. We suggest that reprogramming science funds to other activities be done only on an emergency basis by specific approval of the Director. However, the Regional Director or a park Superintendent should be free to utilize override or other available funds to contract for or supplement project that can not be included or provided for adequately in the science budget.

It is obviously desirable that contractors for research in the parks utilize outside grants to every extent possible. For convenience, research in areas under the administration of NPS can be roughly categorized as follows:

1. Projects established in response to urgent management needs of the Service. These would be specified as to objectives and duration, and they probably will need full funding in the science budget.

2. Long-term projects addressed to broad management problems, often utilizing unique (endangered?) species or life communities. It should be recognized that some research on natural systems requires work over many years -- even decades -- but contract directors of such programs should assume responsibility for securing part of their support outside the National Park Service. Cooperative funding also is possible in many short-term projects.

3. Lands and waters under park service administration are an important scientific resource of the nation, and they should be available for research, as it can be accommodated conveniently, on nearly any problem that will contribute new scientific knowledge. However, problems of choice that have no particular present application to park management should be funded by the research applicant. Often these will be student projects of short duration and

requiring little expenditure. The Park Service obviously has an interest that applies to all fact finding: the information is likely to be useful for interpretive programs now, and it may have other applications at a later time.

It is to be expected that most research proposals will be initiated in the parks. Superintendents have stated the need for an organized method of making their interests known and getting attention in the bureau. Probably a standardized form and a date for submission relative to the budgeting process should be established service-wide. This is a logical function of the Office of the Chief Scientist.

It should be understood that we do not recommend total regidity in such matters. It should be possible for outsiders to deal with the bureau at any level, and referals can be made in-house as may be necessary. Projects not needing funding would appropriately be approved by the Park Superintendent.

Requests for funded research will ordinarily be assembled in the office of the Regional Chief Scientist, where a priority list will be prepared for the Regional Director. This will conform to the base budget and any requested increases. Regional budgets can then be acted upon in the office of the Chief Scientist and a total science budget recommended to the Director. As is the practice in many programs, an unallocated contingency fund should be retained both in Washington and in the regions to meet unforeseen needs.

Reporting on research should be required in accordance with the interests of the park and taking into account the best season for an annual summation of a particular problem. Superintendents at times request ad hoc reports on subjects of immediate concern. Routinely, however, it should be a condition of all funded or permitted research that an informative report (not just a record of work done) be issued once a year, with copies to the Superintendent,

any appropriate Cooperative Park Studies Unit, the Regional Chief Scientist, and the Office of the Chief Scientist.

The administrative structure

We believe it to be a widely recognized principle that the supervision of research and management be separated -- a tenet as clearly defined as the separation of church and state.

Thus, the National Park Service should have an independent, high-level science program immediately accountable to the Director and his deputy. This was precisely the recommendation of the Robbins Committee of the National Academy of Sciences, and we endorse it warmly. The pattern of organization for the social-sciences in Archaeology and Historic Preservation should logically be duplicated for natural science. This means that an Associate Director for Natural Science would also be the Chief Scientist. We strongly support the regional organization of the science program as it now exists, subject to the supervisory recommendations made above.

Service biologists stationed in parks, and such research units as the ones in Everglades and Great Smokies are undertaking projects of direct interest to management. Other studies represent a long-term effort to meet the implied NPS obligation to study unique wildlife resources, both for preservation purposes and as a matter of general scientific interest. This seems an appropriate utilization of scientific help.

It is evident that the Cooperative Park Studies Units established at universities are performing valuable service through liaison activities, technical aid to superintendents, conference planning, developing new research programs, exercising supervisory functions for the region, and in other ways.

adjunct professors, NPS personnel effectively represent the National Park Service in Academia, and they help make resources of the universities readily available to the federal government.

To expedite contract research programs with universities and non-service research units, the Park Service must adopt far more efficient contracting procedures. We are aware of a great deal of justified complaint about inadequacies in the business arrangements made by NPS with its contractors. One of us (DLA) has had personal experience in the frustrations of contracting to do research with Park Service support. The report of Russell Olsen to the Deputy Director, dated January 31, 1975, fully documents the problem. Presumably there has been some recent improvement in this area, but much remains to be done.

In the annual submission of regional science budgets to WASO it is evident that some statement of program outlook and objectives will be needed in support of priorities. In addition, we think it might be beneficial if the regions prepared a longer-range statement of science and research needs at, perhaps 5-year intervals. A national plan could then be formulated and incorporated into any forthcoming administrative manual. The present statement on science in the operations manual is of little value. We think a current statement, issued periodically, would be helpful to reflect changing conditions and especially to incorporate the outlook of new administrations. Basic policies, as established in the legislative charge of NPS, are unlikely to change much. Any restatement will naturally draw upon far-sighted documents that include much enduring professional thought. These date from the time of Wright, Dixon,

Thompson (1930s) and, more recently the Leopold, Sumner, and Robbins reports (of 1963 and 1964) -- obviously a partial listing.

As another suggestion on organization, we believe the Natural Landmark and Theme Studies program in Denver should be associated with the Office of the Chief Scientist. The nature of this work is allied closely with research being done in natural ecosystems, including contract projects. The expertise of science leadership should be utilized in appraising and selecting natural landmarks.

Publication of results

The quality of NPS natural science publications has been, and remains, excellent. We urge that every possible measure be explored for shortening the time between submission of manuscripts and the appearance of a finished product. There have been recent problems of this kind that we understand are in the process of resolution. We approve the policy of contributing page and reprint charges for selected research papers in scientific journals.

It is a longstanding lament of many professionals concerned with research, including responsible administrators, that a great deal of costly work goes unpublished. We submit that no research job is complete until the results are published. The research worker should be under an inescapable mandate (and be given the time) to do his writing. Then he must have reasonable support in getting a quality product published. The National Park Service has experienced personnel and can continue to merit its past distinction in this field. However, time marches on, and a greater investment in publications should logically be anticipated.

Summary

The National Park Service has reached a time in its history, and in the history of the nation, when science and research should be given a much greater

ıd clearly recognized responsibility in policy making, planning, and operations. Seat-of-the-pants guesses in resource preservation and management are open to challenge and do not stand up well in court or in the form of public opinion. To be right in decisions affecting natural environments, and to serve its educational missions, the Service requires an increasingly sophisticated system of gathering new facts and getting them applied at all levels, from the back country to WASO.

We have suggested some changes in organization and responsibility that should help expedite a progressive maturity in natural science functions. We urge that they be given an opportunity to prove themselves and suggest that another and more searching review in about a five year period would be much in order.