

Is the U.S. National Park Service Ready for Science?

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It is becoming increasingly evident that we are entering into a period of rapid change in American society. This process will be at least partly driven by pressures from a world population explosion and competition for remaining resources. Every day the world's population increases by some 240,000 people. The United States's annual growth rate of 0.81% ranks near the top for industrialized nations, resulting in almost two million additional Americans every year. Emigration is expanding the array of ethnic diversity and the accompanying variety of views and perceptions regarding cultural and economic values.

An equally impressive rate of change is occurring in science and technology, allowing the industrialized nations to explore new avenues of economic growth and changes in lifestyle. We can only speculate about where these changes will lead the United States, but we can be quite sure that government at all levels, including the U.S. National Park Service, is going to be affected by these changes, and in some cases will, by necessity, be instruments of change. It is essential that all of the U.S. government agencies responsible for land and resource stewardship closely examine how their current mission may be affected and how the mission itself may be required to change.

A shift in mission paradigm

One of the most fundamental questions relating to change in the USNPS is the repeated call for the agency to make a major shift in the basic interpretation of its mission. The USNPS has been receiving a strong message from the scientific community, segments of the public, and the Congress that it is past time for the agency to change from a primarily public-use/service management paradigm to a resource stewardship paradigm. Although a gradual shift in this direction has occurred at the park and regional level as a result of enlightened management driven by severe resource threats, this has been largely a "bottom-up" process. A major shift in

USNPS policy, driven from the top, has not yet occurred. The bulk of funding and staffing still is focused on the day-to-day public-service operation functions in the parks.

Many of the benefits that would be derived by the USNPS shifting to a resource stewardship paradigm based upon sound scientific principles have been recognized for at least three decades. The actual need for an institutional shift to this paradigm has become increasingly urgent as the years of inaction have passed and each succeeding blue-ribbon panel report and commission analysis suggesting this shift has been placed on the shelf. Jonathan Jarvis, in a recent article in *Park Science* titled "Action vs. Rhetoric: Resource Management at the Crossroads," provided an excellent summary of the various studies and reports that have been completed to date. Although the Vail Agenda does not explicitly call for a major shift in agency focus, it does state that "The primary responsibility of the National Park Service must be the protection of park resources".

The 1992 National Research Council (NRC) Report, *Science and the National Parks*, prepared by the Committee on Improving the Science and Technology Program of the National Park Service, presents an excellent discussion of "Conservation Amidst Change" in the USNPS. This profoundly insightful analysis of the formation of the basic USNPS interpretation of the 1916 Organic Act mission statement illustrates the continued USNPS emphasis on a passive style of resource stewardship focused on maintaining the status quo for recreational enjoyment, in spite of repeated

calls for change. This discussion ends with the statement that, "unfortunately, these repeated exhortations [to change to a more scientific and aggressive management style] have gone largely unheeded, even though they are all the more relevant today. And even where action has been undertaken, it has been marred by inconsistent administrative support and fluctuating budgets." The Committee determined that the primary reason for this failure to respond to the call for change is that "the USNPS remains an agency guided strongly by tradition" and the original philosophical tenet of passive management focused on public service and recreation.

(The NRC report should be required reading for every USNPS employee. The second reading is even better than the first.)

Science and the stewardship paradigm

A critical element in successfully breaking through the "tradition barrier" and pursuing the stewardship mission paradigm is the immediate improvement of the agency's science capability. This is essential to achieve credible research and resource management programs and bring about an improved understanding and appreciation of the value of good science to park management. National parks must now be managed in a complex local and regional context that requires an in-depth scientific understanding of park resources. Development of this understanding will provide the foundation for the effective application of USNPS stewardship policy. As of this writing, the critically needed focus on science as the basis for park management has not oc-

curred. After careful analysis, the NRC report found that "little meaningful and consistent action has been taken by the National Park Service in response to repeated recommendations for a substantially stronger research [science] program."

During this period of post-Vail Symposium self-evaluation, and change in USNPS and Department of the Interior leadership, it is critical that positive action be taken now to provide a science base to support the agency's resource stewardship mission requirements.

Science and resource management

In July 1993, the USNPS director, Roger Kennedy, asked the National Park System Advisory Board to re-evaluate the recommendations made in the NRC Report in light of the formation of the National Biological Survey (NBS). One of the recommendations found in the committee's ensuing report, titled "Science in the National Parks, Adapting to Change," was that, in light of the transfer of most of the agency's research-grade scientists to the NBS, the USNPS had to make an even stronger commitment to developing not just a strong research program, but a strong applied science program in the parks. As far as the biological sciences are concerned, these resource management programs would have to be developed and managed primarily by park resource management staff.

This worries a lot of park managers, particularly those of the larger national parks. When the final decision was announced that all of the biological science research personnel stationed in the parks, Cooperative Park

Study Units (CPSUs) and central offices would be transferred to the NBS, many superintendents became very concerned about the impact this would have on the future quality and "scientific credibility" of their resource management programs.

It seems that although research-grade scientists are evaluated on the quality of their research and publications, many park-based research staff have been serving as senior science advisors to the park superintendent and have also been deeply involved in resource management operations. There has been a reason for the evolution of this situation. In general, the research grade evaluation (RGE) system supports a grade structure reaching GS-15 and therefore attracts and retains highly educated and qualified scientists. Resource management staff fall under the General Schedule (GS) pay system. The GS classification system rarely supports non-supervisory grades at the park level above GS-11. Although the USNPS has some skilled and dedicated resource managers, most of them are graded from GS-7 to GS-11 and very little training and career development has been offered to enhance the basic skills that they brought to the job. They have also been spread so thinly that they rarely have had the time to address the larger strategic resource management needs of the parks. Therefore, there has been a natural reliance by superintendents on the higher-graded research staff that are recognized experts in their field.

There is a well-founded fear that the loss of these high-graded, highly competent RGE employees from park and regional staffs will leave an sub-

stantial gap in the scientific capability of many park, regional, and agency-wide natural resource programs.

Many park managers are now finding that a strong reliance on RGE staff to support resource management programs was not a good policy, although at the time it might have been perceived as the only good alternative. Considering the repeated recommendations of past review commissions on science and resource management needs of the parks, many observers question why the USNPS didn't start the process of building a scientifically credible resource management program carried out by park biologists and other "applied scientists" decades ago. In retrospect, RGE staff should have been focused on obtaining new information on emerging issues and the resource management staff capability should have been continually expanded and improved to apply this new information to prepare and execute both tactical and strategic resource management programs. Although some limited progress has been made as a result of implementation of the natural resource trainee program, the recent development of the agency's inventory and monitoring pilot park program, and scattered heroic efforts made by individual USNPS regions and parks during the past decade, in general, the development of strong resource management capabilities based on sound science has not occurred. Now we have a crisis situation in some parks that relied heavily on the expertise of their RGE staff to address resource issues.

Is the USNPS ready for science?

So now what? We have had every blue-ribbon advisory group, every ma-

jor national conservation organization, thousands of concerned citizens, and even the Congress tell the USNPS that the agency must get on with the job of building a scientifically credible resource management capability so that management of parks is driven and supported by sound science. Where do we go from here? Is the USNPS finally ready for science?

As of this writing the answer is not yet clear. In spite of numerous lawsuits and admonitions from friends and critics alike, there is no definite signal that the USNPS has yet made the commitment to become a resource stewardship agency. Recently, a very well respected agency watcher was overheard as saying that "The USNPS brain is moribund." I guess this is a straightforward way of saying that the USNPS has a substantial institutional inertia (in the form of tradition) to overcome to bring about any meaningful change in the fundamental management strategy. On one hand, there are forces within the agency that advocate a return to an even more basic traditional style of management. In contrast, there is another, growing group of superintendents and resource managers that have come to understand the essential need for management based on sound scientific information. The USNPS seems to be poised (or balanced) on this decision point. It is to be hoped that one of the leading questions currently being reviewed is, *Is the USNPS ready to adopt a resource stewardship paradigm based on science that looks to the future and insures the ecological integrity of the parks?* If the answer is "yes," then the obvious follow-up question is, of course, "How can it best be achieved?"

Resource stewardship

There has never been a greater opportunity for the USNPS to embrace the concept of resource stewardship. The term "resource stewardship" rather than "resource management" or "protection" seems more appropriate to describe the USNPS mission, because it connotes a long-term commitment to sustaining, not just the fabric, but the very integrity of the parks, be they one of the last great natural places or a piece of our cultural heritage. In addition, "stewards" are acting on behalf of someone else, in this case the American public. The USNPS managers must view themselves not just as the day-to-day protectors of the parks, but as stewards with a vision, a vision of the public value of the National Park System in the year 3000.

To initiate evolutionary change and achieve this vision, the USNPS must first find the will to do so. The will of the USNPS is greatly enhanced or slowed by the level of support throughout the Administration and in the Congress. At all levels the support is now there. Never before in the history of the USNPS has the potential support for ecologically and scientifically sound park stewardship been so great. This is indeed an astrological window. All of the planets are lined up to allow for, if not a cosmic event, at least a significant turning point in the management philosophy of the US NPS. This may be the only time in the history of the agency that the agency itself is the only obstacle to accomplishing this shift.

Elements of a successful resource stewardship mission

Much needs to be done. The fol-

lowing are some of the key recommendations that have been made to date.

- USNPS managers, at all levels, must realize that we are entering into an even more complex government service arena that demands a management sophistication equal to that found in the private sector. The parks can no longer be managed in isolation. Superintendents must have sufficient understanding of park resources and greater ecosystem processes in order to integrate park and regional resource protection strategies.
- The USNPS must recognize that an effective and responsive science program is essential to understanding park resources and developing sound stewardship strategies.
- The USNPS should adopt and quickly move forward with the recommendations of the NRC Science and the National Parks report and those of the National Park System Advisory Board.
- The USNPS must develop an understanding of the strengths and weaknesses of its internal culture. The ingrained bias that prevents the formation of science-based programs must be overcome through the careful and thoughtful application of senior-level leadership.
- The USNPS must adopt the highest standards for science, including minimal recruitment standards for new resource managers and science advisors, and a well-defined program of training and professional development to maintain a high-quality staff capability. Many

of these recommendations are detailed in the draft Natural Resources Professional Development Program document.

- An organizational structure throughout the USNPS should be established that assures a career ladder for scientists (resource managers and RGE staff) from entry level through the supervisory levels into top management.
- A high priority must be given to creating resource management organizations in the larger parks that include an adequate staff of biologists, ecologists, hydrologists, and other scientists of sufficient professional capability to address resource issues and obtain scientifically credible answers to difficult questions.
- Parks with complex and or controversial resource issues that requires a substantial research program should consider establishing a position of senior science advisor. This person would assist the chief of resource management in obtaining needed research and would also serve as the senior science advisor and principal liaison with the research community.
- A major effort is needed to obtain additional staffing and funding for

science positions, particularly in the parks. In addition, upper level management should encourage superintendents to adjust the priorities of existing funding to support the greatest stewardship needs and prepare long-term stewardship strategies to continue to improve each park's scientific management capability.

- An agency-wide educational program is needed to bring about an understanding, at all levels and in all disciplines, about the critical necessity for the acquisition of sound scientific information to support park management.
- Rangers and interpreters throughout the USNPS should be called upon to educate the public about the relationship of science to perpetuating park ecosystems and preserving cultural resources.

The discussions in this article certainly do not contain all of the answers, nor have they even asked all of the needed questions, but the achievement of these ten elements should go a long way to prepare the USNPS to fully embrace science as an integral part of the resource stewardship process. *The question still remains: Is the USNPS ready?*

