



Interpreting Research: Fundamentals

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Why interpret research? The answer has to do with what the Service is about, where we are, and where we need to be—soon.

Purpose of parks

The NPS organic act tells us that in the areas we manage, we are “to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the benefit of future generations.”

Park rangers J T Reynolds (left) and Craig Johnson log divers' activity during kelp forest monitoring at Channel Islands National Park.

An object “conserved ... unimpaired” is **preserved**. To conserve wild life (not just wildlife, as Al Lovaas points out) unimpaired requires protection of **ecosystems integrity**—not just things but natural processes. Even the scenery is dynamic, of course; and except where historic integrity overrides that of ecosystems, the dynamism should be natural, or as close to it as possible. Some more recent park legislation has been more explicit about ecosystems protection than is the 1916 Act.

Some of what we are to preserve **are** objects—mostly historic objects—which the 1916 Act and some very explicit subsequent laws tell us to protect **from** natural change; protect from decay, from damage by the elements, and from destruction or disruption by animals, including human ones.

We are also expected to preserve the **story** that historic objects can reveal to us—the information to be derived from exactly where they are found, and how their location and condition relate to what is written about them. Such information is found not only in books and monographs, but also in the evidence of their uses by our predecessors, and in the clues to the natural system with which **they** interacted. We preserve the story, and pass it along.

In some places—most notably, in Alaska—we are responsible for helping to preserve a **way of life**—one that is evolving in our midst and that goes on in ecosystems laced richly with artifacts of the millennia-long evolution of that way of life. We are expected to protect those artifacts, and the integrity of those ecosystems. It is an interesting challenge.

The **sacred** aspects of the lives of native Americans, tied ancestrally as they often are to the natural and historic resources of parks, are given special consideration wherever those ancestral ties exist. And sacred **sites** are given special protection.

Role of research

The protection of ecosystems integrity requires **knowledge** of ecosystems—of what they comprise, and the condition, forms, numbers, distribution and processes by which their components exist, interact, and change over time. We must also discover the relationships between those changes and post-Columbian human activities and products. These require carefully thought-out management to avert, or compensate, for the effects of those activities. Both depend on research.

The preservation of historic objects, and of the stories they reveal, requires finding them, recording all that may be pertinent about their relationship to their surroundings, and devising ways to protect them from theft, vandalism, decay, corrosion, erosion, and “improvement.” All of which involves, or is, research.

To manage parks in a way that reflects respect for native American cultures and traditions that have ancestral ties to park resources, we must establish evidence of those ties—by archeological and ethnographic research. Research, again.

To provide for **enjoyment** of all those things, we must understand those who would enjoy them—how they respond to our manage-

ment of park resources and users, and to the other ways in which we communicate; and what gives them pleasure, as visitors or vicarious “users.” With that knowledge we can better communicate with our publics, increasing their enjoyment and enhancing the protection of park resources. We can define and protect the qualities of human experience that are distinctively afforded by those resources. Our success in these endeavors depends on the research of social scientists. To our considerable detriment, we (and I mean **we**) seem to find it particularly tough to internalize that particular realm of science.

So, research is essential to proper management of parks and to the means by which they are enjoyed.

Research is also a **product** of the parks. It will be an increasingly important one, as the naturalness attainable on a large scale in parks is increasingly in contrast with the rest of the home of humankind—the rest of Ecosystem Earth. As human impacts spread, parks and equivalent reserves will be more and more critically important as benchmark areas by which to gauge the effects and potential effects of the change we cause elsewhere. No ecosystem is totally unaltered; but eighty million acres devoted largely to ecosystems integrity (as nearly as it can be attained and maintained) will be of inestimable value for guidance in the care of the planet we share with all living things.

Resource management

Research is science. The application of research findings to the management of resources (and of resource users/uses)—is also science. It’s also art; so it is **very** vulnerable to debate and criticism. People today are making a very nice living by criticizing resource management in the parks. Some of the criticism is well-founded and fair. Some is not; but a target as juicy as the NPS is irresistible, so fact and fairness often fall by the wayside. We must base our responses—both, defenses and changes in the way we manage—on the results of research.

Resource management is both the application and the **subject** of research, as we attempt to improve the ways in which we compensate for changes wrought by post-Columbian human activity. Here, a note about **naturalness**—about man **and**, or **in** nature. Yes, humans are a part of nature. But it is abundantly evident, in law after law, that we are expected to manage parks to protect **wildness**. Naturalness in park ecosystems is to be that of wild nature—nature as it would function had there never been any change as result of technohuman activity. Where do the works of native Americans fit into this? Tough call. There is no nice, systematic, pat answer. Where should we draw that line between wildness and man apart from nature? Far short of the Disneyfication or urbanization of the parks, I hope.

Other resource management issues are similarly debatable. Do our attempts at eradicating exotics do more injury to ecosystems integrity than the exotics do? Does our regulation of recreational activities improve—or degrade—the quality of the activities? How much fire, under what conditions and at what intervals, corrects the ef-

fect of past intervention and contemporary essential suppression? Can the genetic effects of chronic removal of spectacular males from hunted populations be compensated for? Is the possibility that a historic jewel is buried in a junk collection worth spending huge sums sorting through the junk? By what means might we correct the effects of eradication of major predators from park ecosystems—or effects of their reintroduction in parks on neighboring ecosystems where technohuman **is** a part of the system? As global warming proceeds, can we counteract its effects on parks? Should we? Can, and should, we facilitate the movement of species—even communities—to places where they can survive the new climate created by man? All debatable; and the decisions on each will seldom have the support of **all** the information we'd like to have. But it is unforgivable to make such decisions without doing our best to lay a foundation of research under them.

Role of interpretation

Interpreters depend on research for the stuff of the stories they tell. They must actively, systematically, continually comb the output of scientists, past and present.

Interpreters—most of them well-grounded in a science—must provide bridges between researchers and managers. They must understand management, and management needs, as well as science, to do the job effectively. (It helps if scientists understand these things, too.) They help interpret science to managers—or help test it, by inquiry and reasoned debate with managers who have science training. And good managers nurture scientists and interpreters who do those things well.

Those **other**, but hugely important, publics—park visitors, vicarious users of parks, park neighbors, media people, politicians and their staffs, other agencies' personnel, and our growing chorus of critics—need to understand the importance of science in the parks, too. **We need to help them understand the importance of research-based management of their parks**, and the importance of park research, to the health of the ecosystems on which the continuing benefits from parks depend.

How to do it

Well, how do we help them understand? You tell me. You're the interpreters now. (We all are; but if it's in your title, it's your particular responsibility.) Interpreting research may be your most important task. If you don't do it, we are not likely to put science to proper use. And the parks will bump along on the way to becoming less and less distinguishable from the rest of the world.

The world has never been more ready to listen. Most of our publics are fascinated by science, by what we are learning, by how we apply it, and why. Caution: People are aware that things are changing, and they're worried; but scare tactics have limited value. They are moved and excited by the sights and sounds, the taste and feel of what is in the parks; but proclamations of esthetics superiority won't cut it. There is, however, good reason to fear the effects of continuing environmental insults—and to sharpen perceptions of esthetics values.

You and your conscientious, creative ingenuity have never been more desperately needed. Help us.

Research—Through The Looking Glass

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John W Hanna*

With apologies to Lewis Carol

"Everything's got a moral, if only you can find it."¹

Looking here, looking there, looking through the looking glass—everywhere—all you see is data. "Visitors to our park are 60% male and 37% female, the majority are white and 80% are urban in origin". Research results such as these are basically "Jaberwocky". Images of reality, warped, blurred, colored! How do you focus this data into a meaningful reflection of your world? How do you take the stacks of research, and turn them into ... windows of opportunity?

Most of us in the interpretive field have numerous occasions to use research results. Unfortunately, a great deal of research is conducted without prior thought to its applicability and usefulness. Those in the interpretive field without a firm grounding in research principles will have the additional problem of distinguishing good research from bad. This article briefly discusses sources for research, some common research studies that might be considered, how to develop a framework for conducting research, and some simple principles that can be used to identify useful research.

Off-The-Shelf Glass Sources

Data you need may have already been collected. These are some of the common sources that you might look for:

- Gate or entrance data
- License plate origin surveys
- Comment books or trail registers
- Visitor center or program data
- Historical records
- Personnel
- Species studies
- Species inventories
- National data.

All of these sources of research, or types of glass, are ways of looking at the world. Unframed glass has little purpose and can be quite dangerous. If your glass comes unframed, you may need to custom design. So if what you need to look at doesn't exist—how do you make your own window?

Home-Built Windows

Deciding to conduct research to collect your own data is similar to

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making a window that you can look through into a part of the world. First you need a hole in the wall. Define the need or portion of the world that needs looking at and then determine where that window can best be placed. Before you contribute to the research litter that is filling up our libraries and using our computer time, determine whether you need answers that can only be obtained through research. After you've decided where to build your research window you will need a frame. After-the-fact shimming and insulation are best avoided, so measure your hole properly. Outline all the research details you need to gather and organize them into a useful framework. For one simple problem a single pane window may satisfy your research requirements, but for complex problems your framing will become more complicated. Prior to constructing your window, review the plans for your frame to see if they will work. Will your window open? Do you see what you want to see? Does it need cleaning, or updating, very often? Will you need to caulk the window to fill-up the holes you missed, or have you covered all the possibilities. Once thoroughly planned and reviewed go ahead and select your glass. Make sure that you select the appropriate size and type of glass to fit in your frame. (These issues, concerning reliability and validity, are discussed below.) When your window is complete, and all your research data is collected, all that's left to do is use it. Your frame, plus a little "Windex" wisdom will help you interpret the view through your window.

*When you are describing a shape, or sound, or tint;
Don't state the matter plainly,
But put it in a hint;
And learn to look at all things
With a sort of mental squint.²*

Custom Built Windows

Customizing an off-the shelf window may be a cost-effective way to view your world. The national Public Area Recreation Visitor Survey conducted cooperatively by five Federal agencies, including the National Park Service, produced some results that could be custom built to view the interpretive world. In order to turn the glass into a useful window, a frame was developed from market segmentation theory. Arranging the glass to fit in this type of frame resulted in a number of different window panes. The view through one window pane showed significant differences between interpretive participants and non-participants while the view through a second pane showed differences between interpretive participants based on their involvement in personal media activities, non-personal media activities or a combination of activities. Placing the glass panes in the market segmentation frame and using some "Windex" wisdom, the window produced a view of the NPS interpretive world that suggested that adaptations in product, price, promotion and placement of the interpretive product could be made to better suit the interpretive participants.³

Broken Glass—Stained Glass

Research results are simply perceptions of reality and as such come in a variety of forms: rose-colored that provide you with a warped view of the world, frosted that doesn't let you see through to the important results, and stained or broken glass that have results that are totally inappropriate. Selecting the wrong piece of research is like breaking a mirror, those seven years of bad luck will undoubt-

edly follow you. Fortunately, there are methods of determining whether the research results already compiled, or the research project you are about to conduct, however informally, will provide you with the proper looking glass. When selecting research results to use, or a methodology to follow in collecting research consider the following items:

- Was the information collected relevant to your problem?
- Was the information collected from the appropriate individuals?
- Was the population studied the same, or relatively similar to the population to which you will apply the results?
- Was the research sample selected in such a way as to ensure that it was representative of the population? This includes both an adequate sample size⁴ and a proper selection procedure. For quantitative research, random selection is the ideal, however, purposeful samples and samples of convenience may provide results that are useful for qualitative types of research where representation is not important.
- Were proper tests for reliability and validity performed for the instruments used and the population studied? Reliability is concerned with determining whether an instrument, for example an attitude scale, if used over and over again on the same population, would collect the same information. Validity is concerned with determining whether the instrument measures what it is supposed to measure, all of what it is supposed to measure and nothing but what it is supposed to measure. Think of these two items in the context of a dart board. If you throw ten darts (or conduct ten identical surveys) and each time the darts hit the seven on the outer ring your instrument is very reliable but it may not be getting you the results you want. If your ten darts all land on the bulls-eye, then the instrument is not only reliable, but it is also valid. The references included at the end of this paper are designed to help you understand these concepts in more detail and be able to judge whether a piece of research was conducted appropriately and whether the results can be trusted.
- Was the information timely or you are using information so dated that its like looking into a rear-view mirror.

Types of Glasses You Can Use

Rear-view mirror Use a rear-view mirror for an evaluation of a program, event, or exhibit. You may decide to measure interest, knowledge gained, or attitudes.

Magnifying glass Use a focus group or a detailed personal interview to collect information to assess proposed programs, or to conduct a general needs assessment.

One-way glass Use unobtrusive observation in a visitor center, or on a trail, to determine if visitors are engaging in appropriate behavior, if they appear to be reading the trail signs or exhibit text, and if they have trouble accessing the exhibit.

Reading glasses Use content analysis to examine the comments left in comment books or trail registers. You can also use this method to examine news releases, photos, brochures and other promotional information to determine if the messages you are conveying about your park or program are consistent with reality.

Leaded glass Use detailed research studies to collect data on visitor

needs or preferences. Mailed-questionnaires or telephone interviews can be used to reach users and non-users.

¹Lewis Carol, *Alice's Adventures in Wonderland*, 1865.

²*Ibid.*, "Poeta Fit, Non Wascitur," 1869.

³Pamela A Wright, Gary W Mullins, and Michael Watson, "Market Segmentation of Interpretive Participants at National Park Service Sites," (Paper presented at the annual conference of the National Association of Interpreter's, San Diego, California), 1988 p 31.

⁴Ary, *et al.* say 10% of the population, but generally the larger the population the less needed the sample. Donald Ary, Lucy Chester Jacobs, and Asghar Razavieh, *Introduction To Research In Education*, 3rd ed, (New York, 1985) p 410.

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Guided Biophilia: A Perspective on Interpretation in the National Park Service

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The noted biologist E O Wilson defines "biophilia," in his delightful and thought-provoking book of the same title, as the innate tendency of humans to focus on life and lifelike processes. He suggests that "to explore and affiliate with life is a deep and complicated process in mental development. To an extent still undervalued in philosophy and religion, our existence depends upon this propensity, our spirit is woven from it, hope rises on its currents."¹ Skilled interpreters of natural history have long recognized the existence of this drive, although they may not have fully grasped its power and

*Many of the ideas presented here originated with E O Wilson—his book should be "required reading" for all NPS interpreters. I thank C Hawkins, J Houston, B Moorhead, and E Schreiner for reviews and comments on the manuscript. Janice Walker typed the manuscript.

usefulness. I suggest that National Park Service interpreters can more effectively guide and nurture the biophilia ingrained in each of us to promote understanding of national parks and to help instill a conservation ethic; hence the title of this article.

In working up to biophilia, I begin with a brief look at the relationship of research and interpretation in parks, move on to consider concepts from ecology that seem useful in explaining the goals of national parks, and close with thoughts on the message and audience appropriate for NPS interpretation as the 21st century nears. My emphasis is on interpreting the ecology of NPS natural area; this offered from the parochial perspective of a research biologist.

Interpreting Research

If research is the organized accumulation of new knowledge, then interpretation is the distillation and transmission of new knowledge to educate. This seems straightforward; the difficulty is that the growth of new information in the biological sciences today can only be described as explosive. Full-time research biologists struggle to assimilate new material generated in just their own narrow disciplines. Considering the accumulated information among disciplines, interpreters cannot possibly stay up-to-date in all subjects. Thus, the need is increasing for innovative management of personnel and information to keep the interpretive message current and correct. NPS researchers have a responsibility to provide information that is useful and intelligible to interpreters, and to review interpretive material as requested. Interpreters have the responsibility, if they choose to use the information provided, of getting it right. The only thing more frustrating to scientists than seeing their information go unused, is seeing it used incorrectly.

Additionally, I suggest that as an agency we often underestimate the sophistication of our clientele. Despite the wealth of available information, we oversimplify messages and unnecessarily avoid controversial issues. This was strikingly illustrated during a recent public meeting on the management of the mountain goats in Olympic National Park. I was asked by a member of the "lay-audience" to describe the nature of the genetic diversity in the goat population, and to then explain how elimination of the population would effect the genetic richness of the species overall. Terrific question! Without doubt, the NPS must broaden its offering of interpretive materials.

Thus, NPS interpreters and scientists share an increased obligation to provide current information, to target increasingly sophisticated audiences, and to deal with complex and controversial issues. Presently, the NPS has about sixty scientists stationed in parks or Cooperative Park Study Units and about 1300 interpreters (the latter backed by a cadre of about 2000 seasonals). New bonds between these disciplines must be forged at the field level. Two notable efforts along these lines include: (1) The establishment of "research interpreter" and "science writer" positions in Yellowstone Park. Incumbents are responsible for making research findings available quickly, accurately, and in effective format. (2) A semi-technical publication series will be launched by the science and interpretive staffs of the Pacific Northwest Region. Recent research will be made available through well-writ-

ten articles, in the style of the *Scientific American*, to be sold at visitor centers, etc. Similar innovative means of information transfer must become commonplace to effectively communicate new information.

Interpreting the Purposes of Parks

Worldwide, conservation of nature is generally accepted as the primary purpose of parks. Yet, considerable debate still occurs over how the conservation goal should be pursued. A wonderfully succinct review of park management goals worldwide was published recently in a book about kangaroos. After examining the array of management objectives for parks, these 'roo biologists conclude that the fundamental issue of **how** conservation is to be pursued can be distilled into the alternatives of preserving either biological states or biological processes. In their view, the "management of a national park will be determined by whether the aim is to conserve biological and physical states by suppressing processes, or whether it is to preserve processes without worrying too much about the resultant states."² Differences between the alternatives are subtle but reasonably distinct, and apparently have not been made clear to the American public. Should the reader doubt this—just recall the uproar over the 1988 fires in Yellowstone Park. Levels of misinformation generated in media coverage of the fires, and the resulting outcry from politicians, demonstrated that broad differences and misconceptions still exist over the perceived purpose of Yellowstone.

Effectively explaining the biological purposes and goals of parks is a continuing challenge. Recently, the membership of the British Ecological Society rated the ecosystem, that is, the biotic community plus its non-living environment, as the most important concept that the discipline of ecology has contributed to our understanding of the natural world. I find that reassuring, because it's difficult to imagine a better vehicle to interpret the biological objectives of natural areas. This concept—of the park **ecosystem**—is an excellent foundation from which to explain purposes of the parks and interpret issues. Some of the most substantial and difficult management questions may be more easily explained through interpretation of the park as a changing ecosystem. Using the ecosystem concept, a series of thought-provoking questions could be the raw material of interpretive messages. For example:

1 Are we in business to maintain biological states, or biological processes, or "a bit of both?" If processes are deemed most important, (as suggested by the recent edition of NPS Management Policies³) then states **will** assuredly change over time. Animal populations, for example, may fluctuate markedly within parks as plant communities shift in response to natural forces, like fire. How important are such population fluctuations in maintaining a system's ecological "resiliency?" Does the concept of "multiple stable states" for populations have merit in explaining the dynamics of biological processes in parks?

2 How valuable to society are parks as baseline or control areas? Given the possible effects of technological man on the biosphere, do parks represent meaningful baseline even now? Is it perhaps better to have imperfect baseline than none at all?

3 What is the appropriate role of our national parks in conserving

“biological diversity”? Is it possible to allow ecological processes full rein and simultaneously attempt to maximize species diversity?

4 To what extent are the biological processes in parks seriously affected by human activities beyond boundaries? How dependent are individual parks on the benevolence of neighboring land managers to maintain viable populations of wildlife over time?

5 When and how do we intervene in ecological processes by manipulating the densities of park wildlife? Have we considered fully the consequences on other native fauna from the heavy human harvests of native fishes in many parks? Is there merit to approaching the manipulation of park biota as a scientific experiment?

I suggest that the ecosystem concept could be used **much** more effectively than it is now by NPS interpreters to address these, and other issues fundamental to park management.

Biophilia and the Message of NPS Interpretation

By the onset of the 21st century, mankind may be driving other organisms into extinction at the phenomenal rate of 10,000 species/year (about one species/hour). This massive reduction in species diversity, unrivaled since a comet likely snuffed out the dinosaurs 65 million years ago, is largely due to habitat destruction, particularly in the tropics where forests are being converted into agricultural lands. This loss of diversity “is the folly our descendants are least likely to forgive us.”⁴ Rates of extinction may reach such levels that the future of the human species could be jeopardized.

The message from these accelerating rates of extinction should be clear enough—parks are doomed ultimately unless mankind develops a conservation ethic much deeper than that which exists today. If you doubt the immediacy of this need as far as North American parks are concerned, consider that many migratory songbirds which summer in our parks require subtropical and tropical forests as winter habitat. Already, some biologists associate songbird declines in northern areas with reductions in tropical forests.⁵ I suggest that the primary role of NPS interpretation should be to instill a meaningful conservation ethic, however lofty-sounding this may seem as a goal.

The charge to NPS interpreters then is nothing less than to change a shallow “surface ethic” held by relatively few, into a deeply ingrained ethic, based upon enlightened self-interest, and held by the majority. The route to follow in developing such an ethic is essentially outlined by E O Wilson and involves guiding the biophilia buried deeply in us all. NPS interpreters would do well to follow Wilson’s lead and consider that we may indeed possess innate bonds with other species. Recognition of such bonds is the first step in deliberately using them as a tool to promote an effective conservation ethic.

To reach the suggested goal, NPS interpreters must deal forthrightly with issues that traditionally make federal agencies nervous—evolution, finite resource bases, the reality of acid rain, the need for slowing rates of increase in human populations, etc. In addition, the interpretive message cannot be restricted to campfire talks and visitor center displays—the broadest possible audience must be ad-

dressed. By this prescription, interpretation is not the mere adjunct to park management that it is so often perceived to be, both inside and outside the NPS; perpetuation of the national park idea could well rest upon the effectiveness of our interpretive efforts.

¹Edward O Wilson, *Biophilia: The Human Bond With Other Species*, (Cambridge, MA, 1984), p 1.

²Graeme Caughley, Neil Shepherd, and Jeff Short, *Kangaroos: Their Ecology and Management In the Sheep Rangelands of Australia*, (Cambridge, 1987), p 191.

³US, Department of the Interior, National Park Service, *Management Policies*, 1988.

⁴Wilson, *Biophilia*, p 121.

⁵John W Terborgh, "Conservation Status of Neotropical Migrants: Present and Future," in A Keast and E S Morton (eds), *Migrant Birds In the Neotropics*, (Washington D C, 1980) pp. 21-30.

Does Interpretation Need Research?

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Of course the answer is yes. Our field needs research just like any other profession. The obvious reasons include adding to the body of knowledge, attempting to address difficult issues that interpreters face and assist academics and graduate students in fulfilling their educational requirements.

From a national point of view, I see a handful of academics doing what most of us would term original research. Some very good work comes from a sociological background and from interpretive training to provide us with insights into our visitors and perhaps into our own operations. The National Park Service has a long history of sponsoring research to better operate national parks.

For those of us who are not in the NPS we must find new information by attending conferences, hopefully the National Association of Interpretation, and reading various publications—once again, through the NAI. My experience at the local level of public service is that we are starved for good research on current and local problems we face. Many city, county and small state interpretive operations have no time, skill nor network to pass on new information to each other.

A couple of things come to mind quickly about how effective research is answering professional needs. Some research I read is based to a large degree on statistics. When I see table after table and equations I normally go on to the next article or scan to pick up any understandable results. Some researchers seem to be writing for the lay reader while others for a more academic purpose.

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Another detractor from research is when the researcher READS his or her paper in front of a professional audience. Interpreters can be pretty hard on each other when it comes to effective communication skills. I'm sure we've all heard or seen this in action.

Given that interpretive research is being done, and some have told me that few persons are doing it, we may need to glean whatever we can from all sources in order to make the research meet the needs of our parks. I remember one article about how visitors and managers have up to a 90% difference in how they view a particular problem in a park. This one article has stayed with me for years and forced me to re-think some actions.

Some research has threatened me. After many years of working in the field, my blood pressure rises when I read research results about how effective our interpretive programs are. Having a critical eye when viewing our precious natural and cultural history programs can threaten our very basis for our professional foundation. What if the top decision-maker read some research that such and such a program is not effective in meeting its educational goals. Can we handle this?

After having what I think is a normal response to a perceived threat, we should see research as an aid to professionals. Interpreters should "lean" into research and see new trends or sign posts for us. Change is all around us now and who knows how crazy the 1990s are going to be for interpretive services. Researchers can help us on the front lines with guideposts and road maps to survive.

Knowing that research can miss the mark, be a little boring to read or listen too, or that it can threaten us with questions of our relevance is unfortunate; but my greatest fear is that research on interpretation will shrink. Some schools have dropped their interpretive programs and fewer people are coming into the field. Only larger organizations like the NPS and the Forest Service can afford to keep research alive. I strongly encourage your agencies work in this sphere.

Another arena for research to be promoted is in a professional organization such as the NAI (yes, time for a plug for the home team). Dr Maureen McDonough is the head of the Research Committee and Dr Gail Vander Stoep head of Curriculum and Education. These two are active members of NAI as are professors Mike Legg, Mike Freed, Gary Mullins, and Sam Ham. There are others, but these five come to mind as active in research and within the NAI.

We encourage these researchers and need to give them opportunities at conferences and within our publications to present their work. They need us and we need them. Their clinical style and careful review of our programs and visitors provide necessary insights we would normally miss in evaluating trends. If I could direct some portion of research, it would be to look at changes within the core of our large cities and how our field can meet new needs. In Seattle we have many ethnic and racial groups and little is known about how they use our parks or our programs.

I'm sure most large cities have the same situation. If we do research only on those who come to our parks we will miss many groups who don't.

And if you really want to be helpful, try answering some timeless city park questions such as, "why can't people keep their — dogs on a leash and stop messing up the parks?" ... Now that's your basic park question, right?

Sorting Out Wild Ideas: Interpretation and Research Are Necessary Partners

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Interpretation and research are necessary partners. To confirm this, interpreters need only imagine having to present their activities without the benefit of knowledge made available through scientific inquiry. We wouldn't have much to say to our visitors if it weren't for the scientists whose earlier "wild ideas" have become conventional wisdom. Science and research provide the substance of interpretation. From the photochemistry of plant growth to how those plants figured in indigenous diets and religion, interpretive subject matter is the product of scientific inquiry.

It is true that through the course of scientific research many "wild ideas" remain just that. But, as we all know, others eventually are elevated to the level of plausibility and then to acceptability as facts. The trouble with science is that we never know at the outset which ideas are indeed wild and which are scientific "truths." Research is the process we use to sort it all out.

Today's conventional wisdom seems so obvious—the world is round, not flat; all objects with mass are subject to gravitational pull; the earth revolves around the sun, not vice versa; spontaneous generation does not happen—yet all of these ideas, as obvious as they seem, were once wild ideas that scientists conceived, tested and eventually elevated to "facts." Some of these ideas seemed so preposterous at the time that scientists advocating them were socially ridiculed and even accused of capital offenses. Yet research—countless experiments, no one more important or more compelling than another—has shown these wild ideas to be obvious truths.

Scientific Inquiry and Interpretation

Such is the nature of scientific inquiry, even in interpretation. For as much as interpretation needs research to provide its substance and subject matter, it also relies on research to guide its methodology. Freeman Tilden's principles were the result of one man's penetrating insight and an intuitive understanding of human communication. And today, each of his principles has been grounded in scientific reasoning drawn from cognitive psychology, educational psychology and communication psychology. Such efforts to link Tilden's intuitions to scientific evidence help to underscore our deep respect for him by verifying the "truth" of what he wrote in *Interpreting Our Heritage*. Yet, as revered as his seminal ideas are, were one of them to fly in the face of prevailing scientific

evidence, interpreters themselves would question and even reject the principle as a wild idea. I will return to this point.

Like any research area, interpretive research strives to build a body of knowledge about the interpretation process. Each study, perhaps focused on a particular site or on a particular problem, can tell us a great deal about the specific issue at hand, but comparatively little about the interpretation process at a more general level. This is because sites are not all the same and because the same problems do not usually manifest themselves in the same way in different places. Hence the common scientific apology: “The results should not be generalized beyond the study site.” This just means that one study, itself, doesn’t really tell us much about interpretation. As Charles Lindblom and David Cohen wrote:

Any one specific study, even though it appears to invalidate a standing theory or framework of understanding, fails to do so. Faced by conflict between the results of the test study and the prevailing theory, scientists reject the study rather than the theory.¹

In this view, we must see individual studies as contributing small pieces to the interpretation puzzle. Each study provides a detailed look at the local problem, but only a fleeting glimpse or “pulse” of the general communication process we call “interpretation.” Yet over time, as the small pieces accumulate—some mutually confirming, others contradictory—we begin to see the bigger picture with better clarity; that is, a body of knowledge begins to amass, the puzzle pieces start to fall into place, and wild and plausible ideas begin to sort themselves out. This process, of course, requires researchers committed to chasing ideas, and it requires time for them to do their studies and report their findings. It also requires that all of us pay attention to the results of their work and that we periodically look beyond the individual studies to their collective importance—the big picture.

Interpretive Research Bearing Fruits

Interpretive research is beginning to build a body of knowledge. Some, indeed most studies, have done more to confirm previously held ideas than they have to show new directions. Yet the latter is happening also. For example, results from studies on visitor participation and nonparticipation in interpretive events and facilities collectively suggest that interpretation is not seen by visitors as some autonomous information function, but rather as a part of a larger recreation experience. Some visitors hike, some camp, some fish, some go to visitor centers, some go on guided walks, some take self-guided trails, etc, depending on each group’s idea of a desirable park experience. This viewpoint is contradictory to the old notion that this medium or that medium is somehow inherently better than other media, and that we need only find out which is “best” to fill our visitor’s needs. Rather, we now think that the best way to serve our visitors through interpretation is to learn how interpretation fits, or as Dale Blahna and Joe Roggenbuck put it, “is in tune with” the larger recreation experience.² Slowly, a new way of thinking about interpretation has emerged in some sectors. And this new way of thinking helps to explain why some visitors “specialize” in conducted activity-going, while others tend to prefer self-guided services. And it seems consistent with the frequent research find-

ing that many visitors do not avail themselves of **any** interpretive services. Indeed, this view of interpretation leads us to consider that, to many visitors, interpretation may not represent “information” so much as it does opportunities for desired social interaction, carrying out of tradition, quality family time or other recreational “ritual” not dependent on the nature of the information, itself, but rather on the nature of the delivery system and its setting.

Research on visitors who attend conducted activities is also dispelling the notion that our audiences are naive and impressionable. A growing body of evidence suggests that interpretive activity-goers may represent a small, rather elite segment of the visitor population. They are often different from nonparticipants by their higher educational attainment, their greater familiarity with the local area and others like it, their higher rate of park-going, their higher rate of visitation at the study site, and their higher rate of interpretive activity-going in the past. In fact, prior attendance at interpretive activities is emerging as the single best predictor of whether visitors will attend future activities. Our audiences self-select and those who participate in conducted activities seem to be a highly knowledgeable and experienced lot who regularly attend such events. As Bill Lewis once argued, some conducted interpretive events may simply be informal rituals in which experts tell other experts what they may already know.³ Such a view of conducted activities should not bring their importance or validity into question, but it should lead interpreters to reexamine their techniques, approaches and conventional ways of doing things, because those visitors toward whom interpretation is traditionally directed may not be highly represented in actual audiences. And, as some researchers are suggesting, interpreters might reconsider the strategic importance of self-guided interpretive media in reaching the rest of the not-so-elite visitor population.

Another prevailing notion that is giving way to scientific evidence is that active audience participation is always a desirable quality of conducted activities. While visitors indeed seem to enjoy watching other visitors participate, many do not enjoy being in the spotlight, themselves. In fact, evidence is accumulating that if publicity about interpretive offerings includes references to “audience participation,” attendance will be lower than if no such reference is made. Interpreters, as gregarious, outgoing people, may innocently assume or even prefer their audiences to be the same. In their zeal to make their activities unusual and fun for visitors, they may unknowingly invade the privacy of those visitors who prefer anonymity and who feel most uncomfortable in the spotlight. On the other hand, the elite audiences previously cited may have already self-selected on this variable; that is, they may consist of persons more like interpreters, in personality, than the rest of the visitor population. Research is needed to sort this out.

The Import

In this essay I have suggested that interpretation needs research. Scientific inquiry provides not only the raw information that is artfully transformed into interpretive subject matter, it provides insights into interpretive technique, methodology and fundamental ways of viewing the interpretation process itself. But I also have

pointed out that research takes *time* because it is not the individual study but the aggregate wisdom provided by many studies that leads to insight. I have stressed that this process requires *trained researchers* committed to understanding interpretation, rather than myriad other topics on which they could spend their careers. Finally, I have tried to show that interpretive research is beginning (and perhaps only now) to bear fruit. To illustrate this I selected just three new ideas that are slowly taking hold as research results accumulate. But another point needs to be emphasized as well: These “new ideas” may be “wild ideas”, and other researchers may not agree with them. But I have proposed them and, if the scientific process functions as usual, others may try to prove me wrong. That is the nature of scientific inquiry—falsification. In the meantime, they are just ideas and research will be required to sort them out.

Interpreters are crucial actors in the research process and there are three ways in which they make significant contributions.

1 Interpreters can support research. They do this by continually searching for better ways to do things and by always asking themselves what kinds of information would help them solve problems or make better planning decisions. Since research is not free, they must also have a long-term view of their programs which justifies allocating some of this year’s budget to research that may not pay dividends until next year or beyond.

2 Interpreters can help make interpretation an attractive topic for researchers. They do this by encouraging their professional organizations to publish research articles in their publications. Since most interpretive researchers work in academic institutions, they must demonstrate through what are called “refereed” publications that their research is not flawed or error-prone. Refereed publications contain articles that are submitted to a journal or other outlet for consideration and reviews. The articles are sent out, usually to anonymous reviewers (other researchers) who critically analyze them and make recommendations to the publication editor as to their acceptability for publication. Some articles are rejected by the publication, and others may be published only after one or several revisions. Right now, only two refereed publications exist for interpretive researchers: the *Journal of Interpretation* and the *Journal of Environmental Education*. This is a serious limitation because professors’ careers and job security **directly** depend on the number of refereed publications they have authored. If outlets for refereed publications do not exist in interpretation, university researchers are forced to focus on topics where they do exist. Interpreters must not underestimate their role in making interpretation an attractive research topic. Support refereed publications.

3 Interpreters can help drive the research process. They do this by reading research and by being intellectually involved in the search for the big picture. It is true that researchers share much of the burden. They must first be diligent about publishing their work, not only in the final reports that agencies require as part of research contracts, but in popular publications with broad-based readerships. Second, they must work harder at communicating the results of their research to nonscientists. Too many esoteric, jargon-heavy articles ap-

pear in print. When Gary Machlis and I were editors of the *Journal of Interpretation*, we required that all research articles be reviewed by at least one field interpreter. Our experience was that this person was often a more critical reviewer than the other reviewers. We felt the quality of the manuscripts that were eventually accepted improved as a result. Interpreters can and should demand to be part of the "gatekeeping" process in scientific publication.

If you are interested in becoming a reviewer for the *Journal of Interpretation*, you should contact the National Association of Interpretation at P O Box 1892, Fort Collins, CO 80522, or call the office manager at (303) 491-6434. If you want to know the results of current interpretive research, you can become a member of NAI and receive each issue of the *Journal*. If you would like more information or specific citations for any of the studies I have referred to in this essay, give me a call at (208) 885-7911, or send a note to me at the University of Idaho, Department of Wildland Recreation Management, Moscow, ID 83843.

¹Charles E Lindblom and David K Cohen, *Usable Knowledge: Social Science and Social Problem Solving*, (New Haven, 1975), p 5.

²Dale J Blahna and Joseph W Roggenbuck, "Planning Interpretation Which Is In Tune With Visitor Expectations," *Proceedings of the Association Of Interpretive Naturalists Workshop, February 13-17, 1979*, (Bloomington, MN, 1979), p 5-7.

³William J Lewis, "Interpretation On a Carousel", *The Interpreter* 14:3 (1983), p 5.

Cooperation Between Research and Interpretation: A Pragmatic Analysis

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If Research can be thought of as the inquisitive and analytical mind of the National Park Service, Interpretation is its heart. The Service must have a steady stream of ideas and scientific information but, as someone has stated, "You cannot extract the square root of a sonnet." The National Park System consists of and represents many things, but its greatest value to the American people is Inspiration. Without Inspiration, the System could be managed as a simple collection of playgrounds, wildlife reserves, museums, and scientific laboratories. The analytical viewpoint provided by Research is essential, but it is not the stuff of Inspiration; Inspiration is in the realm of Interpretation.

Interpretation is a function unique to the world, and the key to Interpretation is Truth. Truth includes both scientific accuracy and currency, and the world is changing very rapidly. Visitors are ever more separated from nature, and are searching for their roots in the parks. As the National Park Service's primary interface with visitors and nature, and thus keepers of the flame of Inspiration, Interpretation bears a very heavy responsibility. To meet that responsibility, Interpretation must understand and utilize the fruits of Research.

Interpretation must understand Research, its role, and how to interact with it. The administration of Research within the National Park Service presents peculiar problems and is the subject of debate. As

Lyon,¹ a US Forest Service researcher, stated the sole product of Research is ideas; the requisite of Research is good personnel; and research atmosphere is essential to success. Research must have a high degree of freedom, including the freedom to be totally objective. The debate is not whether Research needs freedom but whether it needs almost complete autonomy. "Almost complete autonomy" is the reality because by policy all research projects must be responsive to Resource Management Plans. In the Washington Office, the Alaska Region and some other Regions, Research is paired with Resource Management within the same divisions. That forces Research into the mainstream; where I believe it should be, especially considering present staffing and funding limitations. Research Grade Evaluation requires supervisors to provide time and freedom for scientists to function under that arrangement. Cooperative Park Studies Units provide high degrees of scientific freedom and in Alaska we have plans to establish CPSU's or similar centers for some scientists while others will be assigned to parks. The acceptance of Research by National Park Service managers is as critical as researcher freedom, and understanding is enhanced by requiring their close association. Sequestering Research would have the opposite effect. But, many scientists and authorities insist Research must be set apart from Management if it is to function properly. Valid arguments can be made on both sides of the issue, and include a tenet that Research must be separated from the application of its findings to avoid suspicion of bias.² US Forest Service Research is almost completely separate from Management. The National Parks and Conservation Association recommended establishment of a centrally-directed, independent research arm distinct from management and operations.³ Its "Blue Ribbon Committee" recommended that 35 percent of the research program should be autonomous from line management to ensure the independence and credibility of the program and the necessary independence of investigators.⁴ Interpretation could benefit from a similar analysis of its organizational place in the National Park Service. Research and Interpretation share many similarities in the types of functions they perform.

Because Research must be largely independent no matter which organizational arrangements are provided, cooperation between Research and Interpretation is incumbent upon Interpretation. Not only will Interpretation be the greatest beneficiary of that cooperation, Research cannot and should not determine or dictate what Interpretation wants and needs. Research has the obligation to provide project reports, but these usually form only a basis for cooperation. Interpretation must get involved, read the reports, ask questions, participate in field projects, review project proposals, invite researchers to make presentations, attend scientific conferences, request critical review from scientists, etc. None of these are new thoughts and many interactions are ongoing, but the pragmatic concept of Research as a producer of information and Interpretation as a consumer may be new to some. Researchers naturally are interested in the effectiveness and influence of their work and are responsive to appropriate requests for assistance in its use. They also realize all functions of the National Park Service must succeed if the Service as a whole is to be successful, and are willing to reach out to ensure that success. Greater cooperation between Interpretation and Research is possible and necessary.

Interpretation should not lose sight of basic messages when attempting to assimilate research findings. While such things as protection of

endangered species, maintenance of biological diversity, provision of research opportunities, and public education are all very important and real benefits of national parks, they are not the basic reasons for establishment of national parks. Too much elaboration of these benefits without the basics is confusing to visitors and blurs their search for ties to the parks and their roots in nature. Interpretation should emphasize national parks are areas of land and water designated by the people of the United States through their elected representatives as special places for the protection of natural resources and processes, and cultural resources, for the benefit and enjoyment of the people forever. Interpretation must use science, not be used by it. Together, along with the other functions of the National Park Service, we must keep the flame of Inspiration burning brightly.

¹L Jack Lyon, *Administration of Natural Resources Research* (American Institute of Biological Science and the State of Colorado, Department of Game and Fish, c 1965), pp 1-5.

²Fred H Dale, "Research Problems in Wildlife Administration," *Journal of Wildlife Management* 25:3 (1961), pp 265-271.

³National Parks and Conservation Association, *Investing in Park Futures: A Blueprint for Tomorrow*, vol. 2, *Research in the Parks: An Assessment of Needs*, (1988), pp 101-02.

⁴Commission on Research and Resource Management Policy in the National Park System, *National Parks: From Vignettes to a Global View* (National Parks and Conservation Association, 1989), p 11.

The Visitor Services Project and Beyond

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Cooperative Park Studies Unit
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The Organic Act directs National Park Service employees to provide for visitors' enjoyment. Therefore, it is important to know what visitors need and want, especially in this fast-paced, changing world. There are many ways to learn about park visitors and their views—by interaction, observation, and inviting their comments and opinions.

While field interpreters generally have a good "feel" for the visitors they interact with on a daily basis, they can't always produce concrete information to back up their feelings. Gaps exist in their knowledge about visitors. Interpreters' perceptions often leave out a considerable segment of the visitor population—all those visitors who don't interact with an interpreter. Interpretive managers sometime end up basing decisions on these intuitive perceptions which may or may not be accurate.

If interpreters can't rely solely on their contacts with and observations of visitors, visitor studies can assist. Park resource inventory surveys have received a lot of attention in recent years. But what about the people who visit the parks in ever increasing numbers? Interpretive research, in the form of surveys, has been done on a limited basis in some national parks for the last twenty years. Such research helps visitor studies, such as those conducted by the Visitor Services Project, offer interpreters another tool to help learn more about visitors.

The Visitor Services Project

Recognizing the need for an easy-to-use, consistent and relatively

inexpensive research technique, the University of Idaho Cooperative Park Studies Unit developed the Visitor Services Project. In 1982, Dr Gary E Machlis, Sociology Project Leader of the University of Idaho CPSU, began developing a standardized technique for studying National Park visitors, and has continued to expand and refine the survey techniques.

In 1988, the Washington Office greatly expanded the scope of the VSP. Two NPS employees began a two year training program under Dr Machlis to convert the VSP into a NPS operation. In 1990, the VSP will split into eastern and western coordinating offices. Dwight Madison is Eastern Coordinator and Margaret Littlejohn is Western Coordinator. Since both offices will conduct visitor studies in parks within their respective areas, this will increase the number of surveys which can be conducted.

To be selected for a survey, a park must submit a justification to its respective regional office when they are requested each year. Each region submits a prioritized list of parks to the VSP Advisory Committee, which recommends selections to WASO where final selections are made. To date, 23 VSP surveys have been completed in 21 national park areas, with ten more surveys scheduled in 1990.

VSP studies involve first holding a workshop with the park staff to determine the questions to be asked in the questionnaire. Questionnaires are then distributed to the public during the survey period, usually one week. After they complete the questionnaires, visitors are asked to mail them to the University of Idaho CPSU. For the parks surveyed in 1988, an average of 86% of the visitors returned their questionnaires. The answers are coded and input into a computer. The data is then converted by VSP staff into graphs, charts, and maps with accompanying text, for use by the park. A followup workshop is held at the park to explain the study results. The park can request additional analyses of the data to provide more specific information about visitors.

Basic Questions Facing Interpretation

The VSP studies offer the opportunity to learn about park visitors. Trends about visitors will begin to emerge as parks repeat surveys. These trends may be useful in broad range planning by the Denver Service Center and Harpers Ferry Center. By using a standardized format, VSP data from different parks can more easily be compared to see what systemwide trends are occurring. This information may be useful for regional offices or Harpers Ferry in justifying additional funds for interpretive personnel or media. As more parks complete surveys, the data can be compared between thematically similar parks surveyed in the same season. A database is being planned which will allow access to data already gathered.

All VSP park surveys gather basic data on visitors through a series of "core" questions which provide information on visitor demographics, as well as sites visited in the park, length of time spent in the park, and participation in activities. A few examples follow of how the data can be used by interpreters.

All interpreters are interested in finding out the answer to the question "Where are visitors from?" Figure 1 shows the percentages

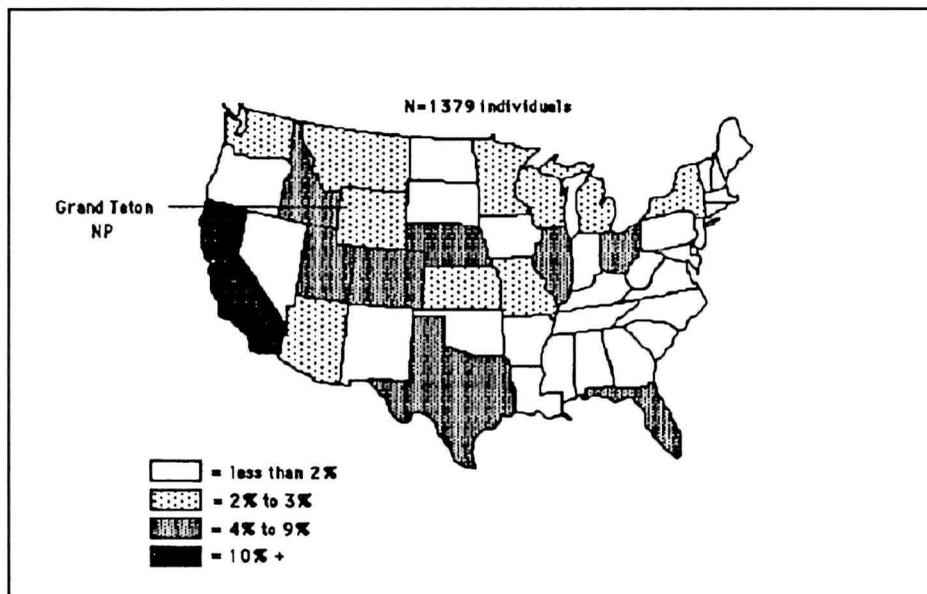


Figure 1: Proportion of visitors from each state, Grand Teton National Park, Summer 1987

of Grand Teton National Park visitors from each state. World maps are produced for foreign visitors.

Grand Teton visitors come from all over the United States—a national visitation, although less came from the Southeast. This data could be combined with information on where visitors arrive from, and what their destination is after leaving Grand Teton. The results could be useful in preparing regional information and in determining what cities need advance information for visitors. Interpreters could prepare a visitor handout to help them plan their visit to distribute at those cities.

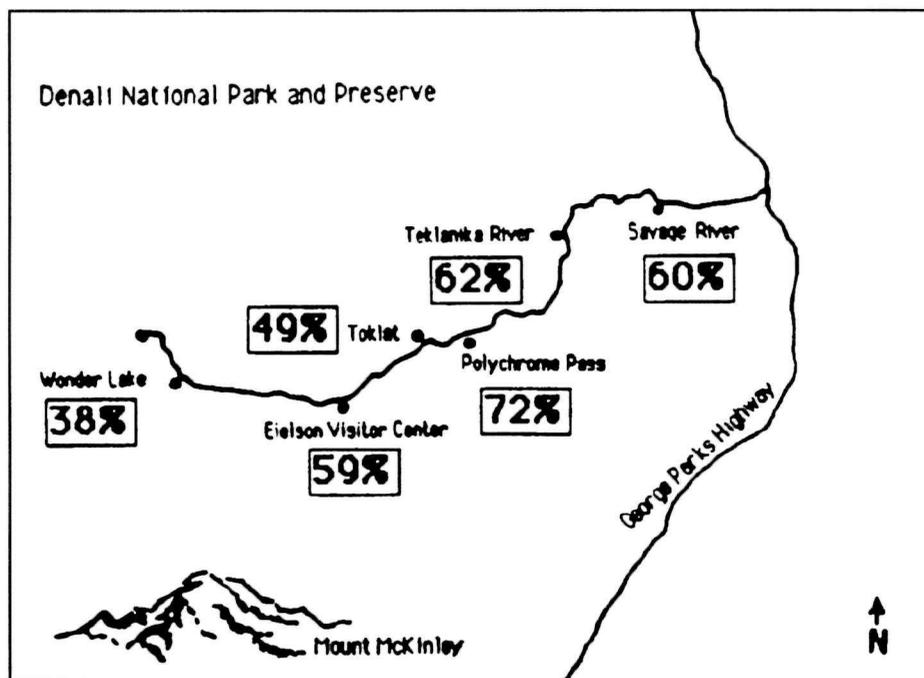


Figure 2: Proportion of visitor groups that stopped at each site, Denali National Park and Preserve, Summer, 1988. N=428 visitor groups. Percentages do not equal 100 because visitors could visit more than one site

“What sites do visitors use in the park?” is another question which can help interpreters in planning. Figure 2 shows the percentages of visitor groups who stopped at each site in Denali National Park and Preserve.

The above map of Denali shows what percentage of visitors stopped at park sites. By combining this information with the activities those visitors engaged in, the number of backpackers, photographers, etc. to each site could be determined. This information could be then be used in planning interpretive activities for specific sites in the park.

Another question which concerns interpreters is: What activities do visitor participate in when they visit a park? Visitor participation in eleven activities, chosen by Colonial National Historical Park interpreters, are shown in Figure 3.

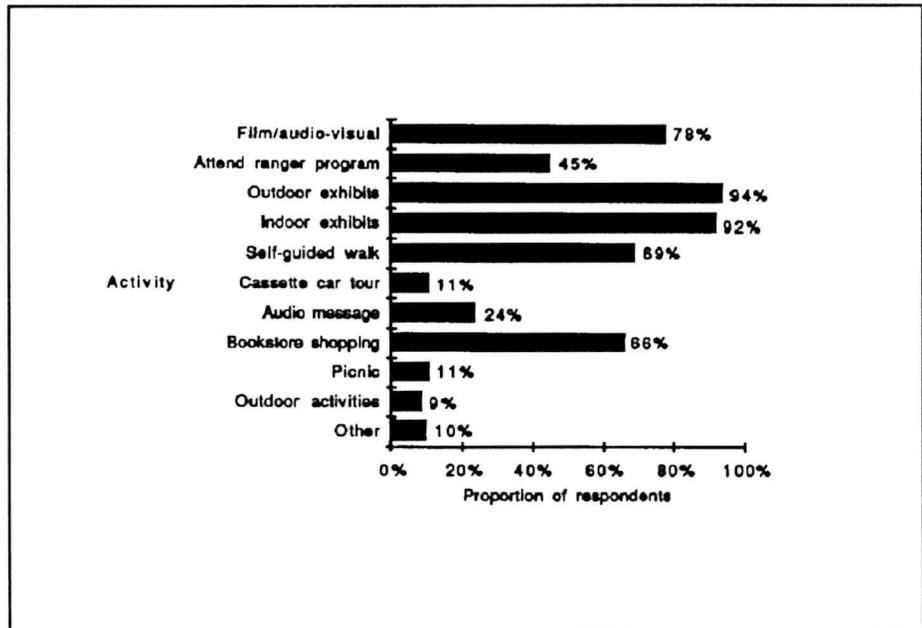


Figure 3: Visitor activities, Colonial National Historical Park, Summer, 1987 N=439 visitor groups. Percentages do not equal 100 because visitors could report more than one activity.

By finding out which activities visitors did during their visit to the park, interpretive managers can make better decisions about which activities should be improved with scarce interpretive dollars. By requesting additional computer analyses of other data gathered in their survey, Colonial interpreters could find out more about the visitors who did specific activities. For example, if they found out that a large number of children used outdoor exhibits, they could develop some exhibits tailored specifically for children.

Interpreters can also ask park-specific questions which may help them in making decisions, such as “How useful are the services offered in the park?” Figure 4 shows how visitors who went on guided walks rated the usefulness of this service at Craters of the Moon National Monument:

Guided walks were considered extremely or very useful by 84% of Craters of the Moon visitors who went on a guided walk. While it is reassuring to interpreters to find out their services are supported, they could use the survey data to find out more. For example, the

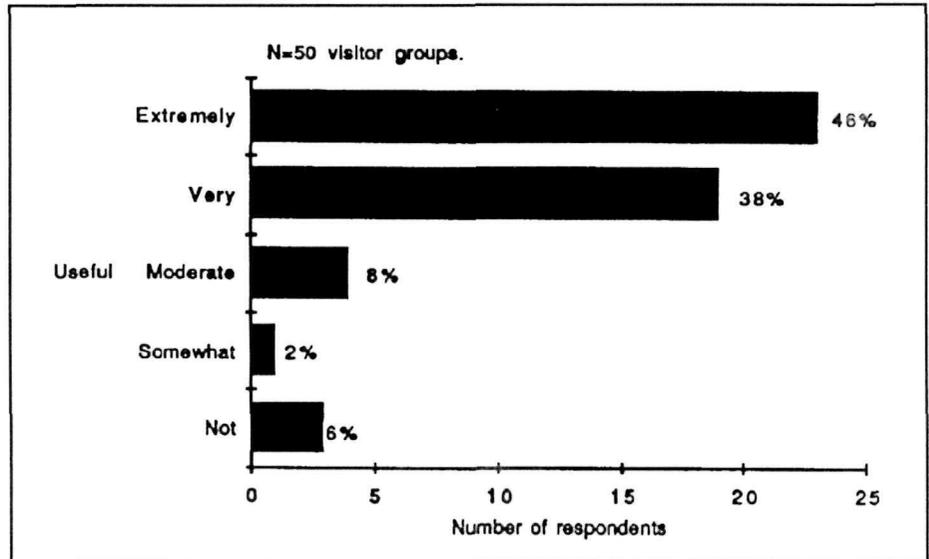


Figure 4: Usefulness of guided walks, Craters of the Moon National Monument, Summer, 1988.

data could be used to find out how many of the visitors who rated guided walks as extremely or very useful also like photography. Depending on the results, Craters of the Moon might want to try offering a photography walk.

Another question interpreters would like visitors to answer is: *“What importance and quality are services in the park?”* Visitors rated the importance of ten services, including interpretation, chosen by Bryce Canyon National Park. The visitors who **used** these services evaluated their quality. Both of these evaluations are shown in Figure 5.

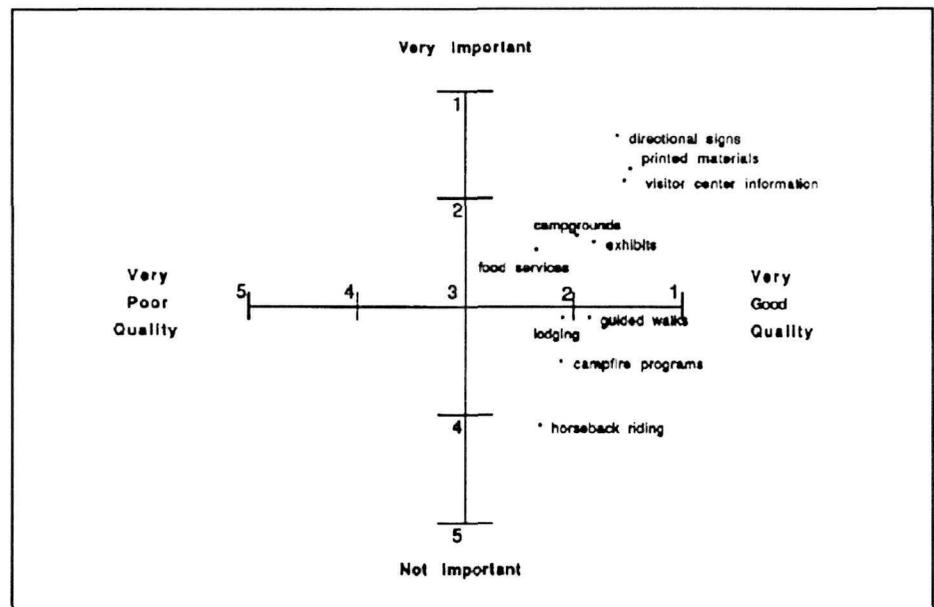


Figure 5: Visitor ratings of service importance and quality, Bryce Canyon National Park, Summer, 1988.

The three most important services visitors ranked at Bryce Canyon are directional signs first, followed by printed materials and visitor center information. Of the services they used, visitors ranked the qual-

ity of the top three in a slightly different order: printed materials highest, followed by visitor center information, and directional signs. It is worth noting that visitors chose two non-personal services as the most important services. Combining this information with visitors' specific comments on how these services can be improved, points out the importance of maintaining the quality of non-personal services. Scarce interpretive dollars can then be spent more wisely.

Research on Interpretation

Beyond such basic yet important uses, data from the Visitor Services Project can be used to research additional questions facing interpreters. Here are three examples:

1 Why don't more visitors use the interpretive services available to them? In many of the parks we have studied, less than 50% of visitors use visitor centers, and less than 20% attend interpretive programs. Yet these services form the core of many interpretive plans, require substantial human and financial resources, and deliver information critical to visitors. The available data deserves careful analysis. Who are the visitors that do not attend? Why don't they? Does it impact their experience? The results could be used to improve participation rates.

2 How can interpretation improve visitor safety? While risks to visitors are relatively small in the National Park System, there remains a management and legal responsibility continually to improve visitor safety. By comparing data on visitor use of interpretive services and available accident records, it might be possible to profile high-risk visitor types and develop interpretive programs targeted to such audiences. Such a combined safety and interpretation effort could be evaluated to see if accident rates can be reduced. Put simply, special interpretive programs aimed at high-risk visitors could save lives and reduce injuries.

3 What makes an effective interpretive program? In many of the parks we have studied, visitors have been asked to evaluate interpretive programs critically. Most rate the programs of the NPS very useful. But there are variations, and these could provide valuable insight into what visitors look for and expect. Are certain visitor types (seniors, young adults, locals, foreign visitors) more critical of what we offer? Are programs more effective with first-time visitors than those that are returning again and again? The answers could be clues in the search for more effective interpretation.

And beyond these applied research topics, there exists a large body of more general, but equally important questions. If interpretation is the special force that Tilden envisioned, then it clearly has the potential to be an agent of social change. How potent is interpretation in influencing visitors behavior, opinions, land values? Can interpretation alter public awareness and attitudes toward global issues—war and peace, the American place in history, racism and sexism, deforestation, global warming and biological diversity? Can it alter local action—encouraging recycling, discouraging pollution, stirring involvement and participation in civic affairs?

And if it can, if interpretation in the National Park Service can change in some way the lives of visitors, how should this important power be used?

The information gained from the Visitor Services Project cannot answer such questions alone. Yet the Project is a practical start in dealing with a key reality of park management: understanding visitors is required knowledge.

Research, Social Change, Ecosystems Management: The Interpretive Challenge of the 21st Century

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Introduction

We are increasingly aware that the National Park Service preservation mandate cannot be simplistically interpreted as a charge to freeze natural resources in time. Ecosystems, of course, are inherently dynamic. Social values and institutions are constantly in flux. Thus, natural processes and culture interact requiring continual examination of management perspectives and responsibilities.

Because interpreters are the primary link between the visiting public and park resources, they have a special responsibility to comprehend, and to be able to articulate, processes of change as they affect parks in the broadest sense. Specifically, they must understand the needs and preferences of visiting populations, the impact these people have on the physical resources with which the Service is entrusted, and the direction and tempo of change in the social environment.

In this essay, I present three examples of demographic change which may be relevant to National Park Service interpreters, discuss ecosystems models as appropriate perspectives for park management, and speculate on possible changes in the role of interpretation in many national parks.

Selected Demographic Trends

Population Growth Substantial numbers of people will be added to the US population by the year 2000, a trend which will continue well into the next century. Between the years of 1985 and 2000, projections for increases for the total US population range from 29 to as high as 45 million persons. To place this increase in perspective consider that the American population increased by approximately 30 million people between 1900 and 1920, approximately 26 million between 1920 and 1940, and 48 million between 1940 and 1960. Thus, despite lowered birth rates, the potential exists to add as many people to the total US population in the next twenty years as in any twenty year period in this century.

For individual parks, however, national trends are not as relevant as those trends in the park's immediate and primary market area. Consider the case of Mount Rainier National Park and population in the Puget Sound region. Total population growth in the four

county Central Puget Sound region is projected to increase from 2.34 million in 1983 to an estimated 3.01 million in 2000, a 28 percent increase. Snohomish County is projected to experience a 41 percent increase in population growing from 360,000 to 510,200.

This rapidly increasing population in Mount Rainier's back door means more people and more automobiles will be entering the park than would be expected purely on the basis of national population growth. Just increased numbers of visitors may mean that day use areas such as the Paradise Meadows will require more sophisticated management as significantly greater numbers of people seek recreation experiences in the park's fragile environments.

Changing Age Structure It is common knowledge that we are a nation growing older. In 1900, four percent of the population was over 65; in 1980, this proportion was 11.2 percent. By the year 2000 the percent of the population over 65 in the United States is projected to be 18 percent. The ratio of working age people to retirement age people was approximately 5.5 to 1 in 1985. This ratio is expected to drop to 5.1 in 1995, to 4.7 in 2005, and to 2.7 by 2030. By 1995, the number of 18 and 19 year olds in the US will decline to 6.5 million which is 2.0 million less than the number in this cohort in 1981.

Nationwide, this trend obviously means, all other things being equal, that park visitors will be older as a group. As we enter the next century the proportion of park visitors who visit as families with young children will decline while the proportion of visitors over age 55 will increase. This probable change has significant implications for facility design and interpretive planning.

Understanding age structure trends in primary market areas, however, is essential for planning at the local park level because variations by region may occur. In areas experiencing significant in migration, and areas where a high composition of the population is race and ethnic groups with high birth rates, the transition to older visiting populations will be less marked.

Ethnic Diversification Since 1980, one-fifth of American population growth has been immigration from Latin America and Asia. Birth rates are also higher among these populations and among blacks. The consequence of these immigrations and high birth rates has been an ethnic diversification in areas where these new Americans are concentrated.

In 1960, one in nine Los Angeles County residents was Hispanic; by the mid 1980s this figure was one in three; two-thirds of the kindergartners were Hispanic. In 1960 one in a hundred Los Angeles residents was Asian; by the mid 1980s, this figure was one in ten. In King County in the State of Washington, the white population increased 21.1 percent from 1970 to 1980 and 4.7 percent from 1980 to 1984. The Asian population increased 144 percent and 28 percent during the same periods.

At current rates of immigration into the US, the number of Hispanics will exceed the number of blacks by the first decade of the 21st century. By the year 2000 33 percent of the California population will be Hispanic, as will 31 percent of the Texas and 22 percent of the Florida population.

Some observers believe that the “melting pot” that functioned throughout the nation’s history to acculturate new immigrants is no longer having the same effect. The result may be that America’s new immigrants and their off-spring will maintain a much higher degree of cultural autonomy than their counterparts earlier in this century. If this ethnic diversification occurs, national parks in regions experiencing this change may have increases in the proportion of visitors from out of the white upper middle-class. If these new visitors arrive in sufficient numbers, the challenge of adapting park interpretation could be significant.

In summary, the three examples of demographic change discussed above are trends that will almost certainly continue into the next century. These trends will have a marked effect upon many aspects of park management and interpretation. They are, however, not the only facets of social change that will impact America’s national parks. Furthermore, social and demographic trends will not affect all parks equally. Research that identifies patterns of change in market areas is necessary to identify the importance of these changes for individual parks.

Social Research, Social Change and NPS Interpretation

Ecosystem Management To understand the importance of the changing social environment for park interpretation, data should be acquired that describes park visitors and visitation in a systems model with both social and biological components and boundaries that may transcend legal park boundaries. Such data can only be gathered by interdisciplinary teams. If the extent of change is to be quantified, the data must be collected in a time series. This holistic integrated approach to research and park management is referred to as ecosystem management. "Ecosystem management involves regulating internal ecosystem structure and function, plus inputs and outputs, to achieve socially desirable conditions. It includes, within a chosen and not always static geographic setting, the usual array of planning and management activities but conceptualized in a systems framework: identification of issues through research, public involvement, and political analysis; goal setting; plan development; use allocation; activity development; (resources management, interpretation); monitoring; and evaluation."¹

Central to this perspective is the necessity of establishing primary components of the ecosystem that comprise a focus for management and research. These components can be identified through enabling legislation or other legislative and policy guidelines that define the primary purpose of individual parks. A basic assumption is that the ecosystems are too complex to be managed as unified entities. Further, political realities frequently present formidable obstacles to managing ecosystems holistically (eg, in an instance where an endangered species is threatened by natural processes, or in instances where catastrophic natural processes may result in unacceptable economic impact). Predictably, the success of this approach depends a great deal upon cooperation with neighbors.

Research agendas are established by first defining system components which are central to management objectives, followed by the

articulation of research questions relating to the interrelation of system components of primary interest, which are under control of management (assuming intervention is intended). Importantly, social systems external to the park are not defined out of management or research models.

Interpretation in this scenario has a much broader focus than what has been typical. Interpretive themes would include social as well as biological elements. The orientation would not be toward the parks as closed systems, but as components of larger biologically and socially defined ecosystems. Important interpretive themes would continue to be oriented toward popular park flora and fauna. New educational missions, however, would probably evolve that were oriented toward the reciprocal influences of the park and its surrounding environment, visitors themselves as part of the dynamics of the park ecosystem, and in some instances on the place of an individual park in the system of national or even international parks. Conceivably, outreach programs could become an essential part of park operations.

A Hypothetical Example Mount Rainier National Park and the Paradise Meadows provide an example of how an interpretive program derived from an ecosystems management and research perspective might function. The research described below was not defined at the outset in an ecosystems management context. The results of the work and recommendations for further research, however, can be discussed with a systems perspective.

Paradise Meadows is a subalpine region adjacent to major developed visitor facilities in the park. The park itself is about eighty miles from Seattle. It is visited by about 1.8 million people per year. Up to 5000 persons per day may visit Paradise Meadows during peak use periods. Decades of human use of Paradise Meadows have resulted in a maze of informal (social) trails created by people who shortcut designated trails, walk to scenic vistas not accessible on the designated trails and so forth. These trails frequently are barren of vegetation, are undergoing erosion, are visually undesirable and are inappropriate to the Agency's mission of preserving a near natural ecological condition (by minimizing human impact). Recently, park managers have increased efforts to rehabilitate the area and have concurrently attempted to devise a visitor-management strategy to minimize damage caused by off-trail hiking.

Because the literature on deterring minor rule violations is sparse, park managers decide to perform on-site research. This research involved a variety of approaches that included both survey and experimental methods. Among other things, the survey research sought to measure the extent to which park visitors were exposed to various park information sources, the extent to which visitors perceived the Meadows to be impacted, and the extent which park visitors perceived themselves to understand minimum impact behavioral expectations. A descriptive profile of off-trail hikers was also attempted. The objectives of the experimental portion of the work sought to establish the comparative effectiveness of various trailside sign texts in deterring off-trail hiking. The major findings of this research are listed below.

Table 1. Results of Paradise Meadows Research

- 1 Trailside signs reduce instances of off-trail hiking. The most effective sign in deterring off-trail hiking is the sanction sign ("Off-trail hikers may be fined"). The least effective sign is the old standard NPS sign ("Meadow Repairs, No Hiking"). The small stake with a symbolic text was not effective. There is almost twice as much off-trail hiking in the presence of the second most effective sign ("Stay on Paved Trails and Preserve the Meadows") compared to the sanction sign. The second most effective sign is estimated to reduce off-trail hiking by approximately 52 percent. The sanction sign reduces off-trail hiking by 75 percent.
- 2 The mere presence of a uniformed person reduces off-trail hiking to a negligible level. Limited evidence, however, suggests that signs significantly reduce off-trail hiking even in the presence of a uniformed employee.
- 3 Polyethylene yellow rope barriers are more effective than split rail fences in preventing off-trail hiking.
- 4 The rate of off-trail hiking increases with altitude to Panorama Point. It is believed that this increase is caused by: (1) salience of the trail, (2) decrease in vegetative density, and (3) increase in the degree of visible human impact.
- 5 Off-trail hikers are disproportionately non-white (a large number of whom are of foreign origin), from the local four county area, estimated to be under the age of twenty years, have less than a college education, and visit in larger groups.
- 6 The impact of individual off-trail hiking behavior is perceived to be less harmful by off-trail hikers.
- 7 Off-trail hikers are less likely to have been exposed to written trailhead signs encouraging them to stay on the trails.
- 8 Off-trail hikers perceive less human impact in the Paradise Meadows area.
- 9 The presence of off-trail hikers increases the probability of additional instances of off-trail hiking.

The comparative effectiveness of distinctly different language for trailside signs in deterring off-trail hiking was demonstrated by the research. The findings regarding the effect of the presence of a uniformed person suggests that: (1) generally, visitors have been educated as to what constitutes expected behavior in the meadows; and (2) it is possible with a combination of signs and presence of agency personnel to almost completely eliminate the behavior that is responsible for the unacceptable resource damage. The finding that off-trail hikers were less likely to read the trailhead signs, and perceived less impact in the Meadows suggest that education does effect behavior, and if perceptions of impact could be changed, off-trail hiking rates might be lowered. Similarly, the finding that off-trail hikers see their behavior as less harmful than those who chose to remain on trails suggests an educational theme for interpretation. Finally a profile (admittedly sketchy) of target groups for resource oriented communication was established.

As managers apply this work at Mount Rainier some important questions will remain. One of these is what is the relationship between the levels of off-trail hiking and unacceptable biological impact? When this question is asked, the interdisciplinary nature of social/biological systems research is apparent. If funds were available, more research is appropriate on this subject in the Paradise area.

The question of appropriate facility design will be an important issue in management planning for the Paradise Meadows. In this planning, it will be crucial that planners understand the potential for population growth in the Puget Sound area and the consequent implications for visitation. Ultimately, facility design and area management must include demographic, cultural, and biological considerations where an ecosystem with substantial human presence is created and managed. Knowledge of the relationships between external social change, park visitation and biological processes will be essential.

Interpretation, Park Ecosystems and the 21st Century
Interpreters, researchers and resource managers will necessarily work as a team if protection and visitor enjoyment of near pristine

resources are to be accomplished in complex situations where park ecosystems are unique in largely urbanized regions. The previously cited work at Mount Rainier National Park exemplifies this type of cooperation. Interpreters will be expected to do more than communicate with visitors about simple biological or botanical questions. Some communications will be designed after research that has as its goal the deterrence of behavior that results in resource damage. Education may be attempted that focuses on (1) the role of the park in the area economy and perceived quality of life; and (2) the impact of external activities and conditions on park biota. The park itself may become an indicator of environmental health; which could be of national or global relevance.

The job of the National Park Service interpreter in this scenario seems certain to be more complex and challenging. Success may not be defined solely in the artistic communication of information dealing with natural process. Equally important may be communications designed to affect the behavior of groups that do not share agency preservation values. The education of the public both in and out of parks as to the benefits of preserving parks as special and inspirational places may also be important.

The changes may be threatening to some and will represent a challenge for most. The potential benefits to the Service and to individual interpreters, however, are substantial. The interpreter of the future may be a communications and/or education specialist who is familiar with the potential of social science as an aid in developing public relations, interpretive, and educational strategies. With this transition, however, will also come more visibility, more responsibility, and more rewards for those interpreters who are able to respond in the tradition of excellence that is characteristic of this profession in the National Park Service.

¹James K Agee, and Darryll R Johnson (eds.) *Ecosystem Management for Parks and Wilderness*, (Seattle and London, 1988), p 7.

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Interpretation and Reintegration: A Personal View

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*Lurking in every researcher, an interpreter
struggling to get out,
Consuming every interpreter, desire to know
what he/she is talking about.*
Olde Instant Proverb

Interpretation, in our argot, is the art of explanation. Explanation of what? The facts and deeper meanings of the parks we manage. In the recent schizoid past—say the last twenty years—the art part of the public act of interpretation has been the province of professional communicators and media wizards. The substance of the explanation part—that is, facts and meanings—has been the province of isolated professional researchers in discipline fields: history, anthropology, geology, biology, and so on. The live explanations heard by visitors come from seasonal employees who may or may not have professional competence in the art of communication or the facts and meanings inhering in the areas they happen to be working. The fixed devices and media presentations at these areas may be artful but not factual. Or, if it be a neglected area, the old-style interpretive collage may be factual but not artful.

It is not necessary in these pages to go into a Tildenesque rapture about provocation and inspiration. These should be understood as the essence of the art part by readers of this bulletin.

It **is** necessary to talk about the structure of the National Park Service if we are to have interpretive integration that synthesizes art and substance in presentation.

Let me first distinguish between personal, live interpretation and impersonal, device-media interpretation, henceforth **personal** and **impersonal**. We rely on impersonal interpretation largely because we have neither personnel nor time for comprehensive personal contact in large, crowded parks. The knowledgeable, discursive teacher of old—those archetypes who lived and breathed their parks season after season—combined art and substance in live presentation marked by a kind of warm invitation that transformed auditors into active participants in the program, explainers in their own right of the scenes and artifacts before them.

One still sees exceptional people of this sort, here and there—but by chance, not by structure anymore. Instead we have seasonal people, most of them in any given season, young recruits without the

immersion-in-place that distinguished their predecessors; and, in most areas, without the substantive preparation and the senior art-and-substance specialists to feed their strivings or brace those of them not striving.

Personal interpretation is still the most effective interpretation when conducted by someone capable of doing it. It is the form of interpretation that can respond to individual visitor interests, to the question from the back row, to the wonderment and wisdom of the child.

Most areas—no matter how mechanized they now are, no matter how crowded they may be at certain places and times—have other places and times where they can develop discursive, non-rote personal interpretation. To do so they need senior art-and-discipline specialists on staff who can prep, critique, and push to greater vision and responsiveness the seasonal recruits.

Many areas, lacking these requisites, have effectively given up personal interpretation of the higher order, even if they do have talking heads filling slots in residual traditional programs. In these circumstances mechanized, standardized, impersonal interpretation takes over almost exclusively. It is safer, and it surely costs less. Then we have stories about “interpreters” responding to a visitor’s question by pointing to a button, which, if pushed, may or may not activate a tape which may or may not obliquely answer that question.

This is a structural problem. Philosophical and funding priorities deeply-seated in the Service’s on-the-cheap personnel and position management programs have produced apathy toward individual visitors manifested in cribbed, functionary interpretive contacts totally at odds with traditional Park Service ideals of service to the public.

The exceptional managers and interpreters who surmount these difficulties, and fortunately there are many of them, must swim against the current to do so. Many areas lack strong swimmers. Thus, as independent evaluation after evaluation has charged over the past twenty years, the **general** level of interpretation in the National Park System has declined toward shallow, rote mediocrity. This is not good enough. We need a blend of communication and substance specialists, integrated not adversarial.

Certainly the good old days were not so golden as some old codgers remember them. Fact specialists who could monologue the tail off a donkey, or fatally wound the curiosity of a child, there were. Scabrous accretions of dismal exhibits fashioned with yellowed plastic and scotch tape, there were. But a lot of the communications amateurs then in charge loved their parks and made up for failures of method with depths of knowledge and devotion.

Now we have swung to the opposite pole. We can fashion splendid devices that are supposed to make up for the declining personal element. But this is interpretation without a soul. In a value-system System that is an oxymoron.

We must make some tough moves to remedy the personal interpretation problems here described. The essence of solution is felicitous combination of the best of the last twenty years with the best of the traditional past: Communication cum substance via gifted interpretive leadership by people doubly gifted in art and knowledge. A few steps toward this goal are listed below (others can think of many more). These are phrased as imperatives, because that's what they are:

1 Each area must have on permanent staff the requisite number of discipline specialists with excellent communication-arts capabilities to match the repertoire of mainline area themes and resources. This person, or the most equal amongst equals in the multifaceted areas, should be the chief interpreter of that park. The function of this worthy is multifold: constantly to refresh the substance base of the interpretive program by direct or acquired research; actively to recruit, train, critique, and motivate gifted, seasonal firing-line interpreters; and to feed substantive resource/value considerations into the planning-management-operations ethos of the park. This person must be of renaissance quality in discipline, interpretive, personnel, and bureaucratic skills, for he/she is the discipline-honed guardian of the soul of that park; this charge ramifies into both the protection of the area's prime resources and the inspiration of visitors. People like this cost money and they are hard to find and keep.

2 There must be an equal commitment of force and talent in the regional and Washington interpretive divisions. With knowledgeable, dedicated personnel in place at the parks, providing opportunity for coherent interpretive management from top to bottom **and** from bottom to top, these upper-level divisions would have some work worth doing again. There would be someone there, at the park, demanding things, responding, arguing, and battling for that turf and program that **was** a mere adjunct to the area's recent management.

3 Recruitment of senior, repeat, professorial-level seasonals as interpretive advisors must be reinstated via commitment of attractive grade levels and flexible work schedules that accommodate academic terms. This type of interpreter—singular or multiple, depending on complexity of area—bridges the gap between the permanent chief interpreter and the firing-line seasonal recruits, providing much of the substantive training, critique, and inspiration that the chief interpreter's management functions crowd out in the busy season. Bringing back such substantive continuity, with perhaps special-study outlets for the academician, would upgrade the general tenor of interpretation and provide a specialized resource for motivated visitors and students intent on area themes and resources. It is high time that we had some accessible experts on hand for discursive communication with peer-level visitors. To be ignorant and illiterate in our own parks is shameful nonfeasance at best.

The sum and substance of the personal-personnel phase of reformed interpretation is revitalization of managerial and substantive power and talent at the three line levels of the Service. This is a program that requires leadership at each of these levels to synergize a respectable and responsible product for the visitor. To mention leadership in the same breath with interpretation—in the

present hat-in-hand interpretive era—is, of course, a shocking juxtaposition. But anything less perpetuates today's fatal flaws.

Now to device-media interpretation. Lack of substantive interpretive people at all but the larger parks contributes to, indeed assures, standard-formula interpretive planning and device-media products. With little or no discipline capability on site, the visiting planning team—itsself ignorant of area ambience and nuance—waves its collective arms and rhapsodizes about the area's wonders, but lacks the substance to transform that momentary field vision into a crystallized, crafted planning product. Perfunctory review of the plan at the area—by people centered on other matters and incapable of assessing the plan's bare factual accuracy, much less its inspirational quality—is typically followed by a regional office rubber stamp. In many instances regional office discipline specialists, cloistered in research divisions, have no hand in the review process. (This is insane!) And largely this occurs because regional reviewers feel no pressure from an area interpreter whose proprietary and substantive instincts have been offended by the formula offered in the plan.

Then follows the contracting out to varied experts who write, illustrate, film, and finally fabricate a device-medium product in a studio several thousand miles from the park, often without a visit to the area.

This process is a formula for formulaic products. Design, flash, and hyperbole substitute for substance and the simple profundities of the park. Empty excellence is the best result; vacuous mediocrity the worst.

Perhaps I have been a bit harsh and prone to over generalization. But the exceptions are indeed just that. The **structure** of personnel, planning, and production induces the formulaic rather than the individualized, distilled essence of the park.

Until art and substance are reintegrated beginning at the park level and progressing to the top level, interpretive integrity will elude us, except as the exception. So long as parks are deficient in gifted persons concerned with the facts and deeper meanings of their areas—and possessing the Thespian obsession and talent to deliver them—parks will be run as facilities rather than as the sanctified properties that visitors seek and Congress intended.

So long as gifted, immersed-in-place people are lacking or disregarded in the creation of interpretive products, so long will these products be lacking.

The interface between sacred places and seeking people must be manned by the closest thing our secular world can call a priesthood. And all those in regional offices, the Washington office, and the service centers who inspire and serve this cause must cultivate, counsel with, and respect this priesthood. Otherwise we have forgotten our purpose as a Service.

About This Issue

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