EMPLOYING VISITOR STUDIES AND VIDEO MEDIA

TO BETTER COMMUNICATE SCIENCE IN NATIONAL PARKS

by

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ABSTRACT

The future of the National Park Service depends upon the agency's ability to educate the public to care for and preserve America's parks. In order to achieve this, parks must provide accurate, up-to-date scientific and preservation management information to visitors so that they gain a greater appreciation of parks by understanding what they protect. Although the Park Service has gone to great lengths to ensure scientific information is utilized in all management decision-making, no management documents or Park Service programs currently provide practical guidance or are adequately equipped to directly address communicating accurate and up-to-date scientific and preservation information to those who hold the future of parks in their hands: the public. Demands placed upon interpreters, who are the park staff primarily responsible for front lines visitor communication and services, are such that science communication can get lost in an array of other informational needs. Researchers, resource management, and visitor service personnel must create avenues or maximize current strategies to cooperate more effectively to communicate park science and management. Contrary to interpretive trends in the National Park Service, social survey and visitor studies show that communicating scientific and preservation information to visitors at parks and other institutions is expected and well-received.

One specific underutilized form of both employee to employee and park to visitor communication is that of video media. Video allows a platform for scientists to speak directly to visitors, train other park staff, and encourage continued divisional cooperation. It can also provide an effective archival media library of information. A filmmaker must forge through bureaucratic and institutional realities in order to achieve successful scientific communication, but the benefits are immense when this work is crucial to help sustain the future of "one of America's greatest ideas," the national parks.

CHAPTER ONE

INTRODUCTION

The National Park Service's (NPS) mission sets out a difficult task for those who must ensure its success. Employees of the Park Service must "conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment for the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (Organic Act, 1916). Is it really possible to conserve the landscape and its natural resources "unimpaired" while allowing visitors and subsequent generations to enjoy the parks? As an agency the NPS has frequently chosen the path of educating the public to care for and value the parks' natural and cultural resources to ensure this conservation legacy. Therefore, much depends on the ability of park staff to effectively communicate accurate knowledge and preservation ideas to the public. Unfortunately, empirical evidence shows that visitor publications, exhibits, and ranger programs sometimes contain out-of-date scientific information, as well as detailed and basic scientific inaccuracies. They also occasionally fail to provide any substantial scientific information. Through examining visitor studies and increasing scientific communications using video media, the NPS can revitalize its critical goal of teaching the public to care for and understand park resources, thus sustaining its future as "one of America's greatest ideas".

Legal accountability and funding provide the primary motivations and guidelines for any government agency such as the NPS. Several legal requirements demand

accurate information and reporting because accountability stretches from the Congressional level all the way to individual parks and divisions. Within the last decade, accountability for accurate scientific information from which to make management decisions has risen to the forefront as the way to ensure the Park Service was responsibly caring for their resources. The Natural Resource Challenge, signed in 1999, required that science-based decision-making be utilized in all national park management. Any new management projects must consider the actual and potential natural resource impacts on a park and provide paperwork that addresses both these issues and provides various plans of action. The importance of the scientific studies, subsequent paperwork, and final actions has been supported by court cases in which the Park Service has defended its management position. (See, for example The Fund for Animals v. Gale Norton and The Florida Biodiversity Project v. Kennedy.)

Although there is plenty of evidence for the seriousness of providing accurate scientific data for management purposes, there is the additional but equally important issue of providing that information as well as presenting preservation ethic guidelines to the public. A variety of smaller programs and funds have been used to tackle this task, including Research Learning Centers, seasonal training agendas, etc., but no servicewide-funded program has been created to duplicate the impact that the Natural Resource Challenge has had on combining science and management to better unite agency science with visitor services.

Many visitors clearly do not already have a significant scientific understanding of park resources. Adult civic scientific literacy, defined as only a general understanding of

basic scientific concepts and the nature of scientific inquiry, is a low 17 percent in the United States (Gross, 2006). In a climate of an increasingly accelerated pace of scientific development, informal science educators and institutions such as the NPS will play an even more important role in providing up-to-date scientific information following the end of formal schooling (Miller, 2002). A fundamental part of the NPS's legal mandate is threatened when the agency's public educational mission relies on the assumption that "the public will protect what they understand," but, through inadequate funding and program development, there is no clear strategy for communicating scientific information to the public.

As a lifelong park visitor and recent staff member serving four years in resources and two years in interpretation, I have become keenly aware that there are noticeable scientific inaccuracies and omitted items communicated to the public through exhibits, publications, and, especially, ranger talks. In order for the NPS to adequately serve its mission and, in turn, secure the agency's future, a paradigm shift must occur that values the communication of science to the public as much as the utilization of scientific knowledge for management decision-making. To better understand the current situation, it is necessary to identify important management documents, evaluate existing programs, and consult cognitive and visitor survey studies.

Cognitive and visitor studies provide the most practical guidance for teaching science to audiences and should be better utilized to direct Park Service communications. Although perhaps contrary to NPS interpretive trends, visitor studies provide the best documented evidence on how to serve the public when it comes to communicating

scientific messages. Utilizing this research data to augment current programs and develop new ones should replace other interpretive trends that lack evidentiary substance such as those that disregard visitor interest in science.

Visitor and cognitive studies to improve the use of media resources will prove to be the catalyst for revitalizing the NPS mission of communicating science to the public. Communication and collaboration through additional digital video usage provides an array of solutions previously unexplored. Although traditional video uses exist, primarily as orientation videos for park visitors, the parks could also use video to train new staff, increase interdivisional cooperation, and create an avenue for scientists to communicate directly with staff and visitors. Since this is a governmental and historical institution, the NPS may encounter practical and ideological judgments that resist the broadened applications of video. However, with informed preparation of bureaucratic and institutional realities, a filmmaker may forge ahead to successfully tackle the crucial challenge of communicating science in the national parks.

CHAPTER TWO

A PRACTICAL LOOK

Seasonal Interpreters

In order to better understand why it is logistically difficult for parks to provide current scientific and preservation information both internally and to visitors, it is important to describe the experience of seasonal staff at national parks that are on the front lines of visitor communication. Great demands are quickly placed upon seasonal interpreters from the moment they begin work in a new park. The seasonal interpretive experience is shared by rangers, visitor use assistants, fee collectors, volunteers, docents, and interns. Frequently, these foremost visitor contact positions are paid at the lowest grade, and are usually therefore, the least experienced personnel. Seasonal employees may arrive at a park from out-of-state, move into park housing, start training, put on a uniform, and have their first experience communicating with the public in a matter of hours to no more than two weeks. Visitor expectations of Park Service employee knowledge are extremely high and, although the employee may be spending his or her first day ever in a new state or national park, the visitor expects answers to questions that range from, “Where can I camp?” to “I saw a yellow bird today - what is the name of it?” The new employee is placed in an extremely intimidating position, especially when the general public belief is that rangers should know all the answers. A good example of this

expectation is the game “stump the ranger” that visitors often play by continuing to ask questions until they reach a question that the ranger cannot answer.

In order to prepare for this hectic and intimidating experience, many “seasonals” read up on the park and surrounding area guided by a training packet mailed by their supervisor prior to arrival. They also often visit as many trails and points of interest in the park as soon as possible (Seasonal Training, 2006). This initial superficial knowledge goes a long way to satisfying most visitor inquiries, but there is still much more for the seasonal employees to learn, including information about park management projects, scientific research, and “hot button” political topics. Whether answering a visitor question or preparing an interpretive program, more complex knowledge is required and expected of seasonal park employees.

Observed Informational Faults

The breadth of incorrect information spans from basic scientific concepts such as geologic time to details of exhibiting an incorrect display of bird gender differentiation. A common problem is the spread of “ranger lore.” This kind of “park legend” occurs when incorrect explanations or facts disseminate throughout the staff or when accurate information is distorted through the spreading of information that resembles a game of “telephone.” Hundreds of staff may be misled and, consequently, propagate incorrect information through current and future generations of park employees (Seasonal Training, 2006).

Fundamental scientific concepts essential to a park site are not always understood or properly explained to interpretive staff. One interpreter responded that their park "had no geology" when questioned on the topic (Koch, personal observation, 2002). This could not, of course, be the case. An interpreter who had been employed for decades was grateful to finally receive a full scientific explanation of how the park's primary resource, a canyon, was formed so that she could confidently provide an answer to one of the most commonly-asked visitor questions (Koch, personal observation, 2006). Other resource and interpretive staff have had similar experiences noting misinformation.

CHAPTER THREE

RECENT RELEVANT MANAGEMENT DOCUMENTS

Management documents provide the guidance for all Park Service operations, budgeting, and communications. A review of these documents reveals that they lack the practical guidance that would allow park personnel to conduct scientifically accurate public communications. Although many of the documents refer to the importance of this public communication, inadequate budget allotments and inconsistencies regarding responsible parties undermine the successful execution of this task.

Park Service operations and communications are directed by legislative mandates and legal requirements that may follow a lengthy path from the Presidential and Congressional level to the Department of the Interior to the Washington D.C. office of the NPS to regional park offices and, finally, to the parks themselves. The distance these legal directives travel is significant, and therefore, may lose some of the practical aspects that need to be applied for guiding national parks. Therefore, the service should also look outside its management publications to find more useful guidance with which to provide scientifically accurate visitor communications.

Natural Resource Challenge, 1999

Although this Congressionally funded program was ground-breaking in requiring that management utilize science-based decision-making in their actions, only a feeble attempt at providing visitor services was proclaimed. The documentation acknowledges

that, “the lack of information about park plants, animals, ecosystems, and their interrelationships is profound” (National Park Service, 1999). Once this crucial information is gained, the Challenge insists it must be shared widely so that all may benefit from it, both educational institutions and the public alike. Sharing information is deemed so important that one of four goals exclusively demands that scientific research is publicly communicated. Out of nineteen budget items, however, only two are linked to sharing information with the public. These comprised only eight percent of the total budget (National Park Service, 1999).

Clearly, the focus of the 1999 Natural Resource Challenge is to obtain scientific data in an attempt to responsibly understand park resources so that management is appropriately prepared to make decisions. The idea of widely sharing this information with the public grows from the taxpayer funding base of the parks. Obviously, however, an unfunded or poorly funded mandate is not sufficient for parks to complete the task.

Management Policies, 2001

Chapter 4: Natural Resource Management and Chapter 7: Interpretation and Education

Chapter 4 and Chapter 7 of the 2001 Management Policies for the NPS provide guidance to managing parks’ natural resource programs and visitor service operations. Both of these chapters stress, to differing requirement degrees, that accurate and up-to-date scientific information must be shared with the public. The key thoughts expressed in these chapters relate to science communication; unfortunately, each chapter paints a

different picture of staff procedures that should be followed. Chapter 4 indicates that natural resource managers have the option of providing quality control to ensure the scientific accuracy of visitor communications. In contrast, Chapter 7 insists that interpretive rangers maintain a dialog with researchers to provide accurate visitor services. Therefore, these two chapters indicate an incomplete and potentially contradictory relationship in order to achieve science communication. Researchers and resource managers are not required to maintain a dialog with interpreters. Missing from both chapters is a requirement that resource *and* interpretive staff work together to ensure accurate and current scientific information is communicated to the public.

Director's Order #6: Interpretation and Education, 2005

Within the background information, the Order states, "Interpretation and education is the key to preserving both the idea of national parks and the park resources themselves." This statement highlights the importance of visitor communication in preserving the future of the agency and protection of its resources. The most ground-breaking statement in Director's Order #6 finally gets at the nexus of who is accountable or responsible for accurate interpretation of park resources. "Superintendents, historians, scientists, and interpretive staff are responsible for ensuring park interpretive and educational programs and media are accurate and reflect current scholarship." Although this statement finally answers the question of "who is accountable and responsible," the practicalities of having such a range of personnel responsible without a framework for communication among them lacks forethought and realism. Thus, Director's Order #6,

on paper, describes a relationship between scientific information and interpretation and who is accountable for ensuring the quality of content shared with the public. In reality, the list of responsible staff is so long and the positions so general that the mandate lacks a practical framework in which to direct the NPS.

CHAPTER FOUR

EXISTING PROGRAMS

It is not surprising that the lack of practical management guidance in Park Service documents has resulted in existing servicewide programs that are ill-equipped to communicate accurate and up-to-date scientific information consistently to visitor audiences. There are many programs in the NPS that in some way address communicating scientific information to the public. Advocacy groups, such as Public Employees for Environmental Responsibility (Ruch, 2006) and others (Dorwart, et al., 2004 and Longino, 2005), have pointed out the need for better or more accurate scientific communication to take place in parks. Unfortunately, due to insufficient scope or focus, none of these programs singularly or collectively respond sufficiently to these complaints or tackle the immense challenge of providing up-to-date scientific information to visitors so that they will understand and preserve park resources for the future.

Interpretive Development Program

This program is seemingly the most obvious existing institution in which to ensure and promote accurate scientific information, but it does not attempt the feat. The Interpretive Development Program (IDP), developed in 1995, is touted as professional development for NPS interpreters. The basic premise is that interpretive rangers or others in visitor services fields submit products within a specified module to be evaluated by an IDP certifier (other interpreters who have been trained in certification) to meet a

benchmark competency. The modules range from presenting interpretive talks to leading other interpreters. The competencies, defined almost verbatim for each module, state, "The program facilitates opportunities for the audience to make their own intellectual and emotional connections to the meanings/significance of the resource, through the cohesive development of a relevant idea or ideas," (National Park Service Interpretive Development Program, 2003). For example, the competency can be achieved when the interpreter has assessed the needs of the audience, demonstrates creativity, uses park resources to support the content, presents a talk in an engaging manner, provides a balance of facts and acknowledges multiple viewpoints, and communicates an appropriate amount of information and understanding.

There are several problems that make this program inadequate to achieving a goal of providing accurate scientific information to the public. The two key problems are that there is no request for sources or a reference list of information and no avenue in which the scientific content or preservation messages can be evaluated. Mahaffey (cited in Risk, 1994) provides a more well-rounded approach to training interpreters by suggesting that the ideal curriculum should include biology, physical sciences, natural sciences, social sciences, natural resources, communication, administration and others.

Articles written in support of the program further clarify the discrepancy between science and interpretation. Blacoe and Fudge (2003) state that interpretation is the primary link between resources and visitors, but within the IDP there is no discussion of content evaluation. The IDP further concludes, without supporting proof, that "through

quality interpretation we are rediscovering the meanings of our resources and more effectively sharing them to spread our stories, stewardship and preservation."

Lacome (2003) finally addresses that interpretive effectiveness is the only element being certified in the IDP. The author quickly dismisses content (accuracy, appropriateness, etc.) and mechanics (voice, pacing, etc.) as the responsibility of the park and supervisor. Lacome also freely discusses that no formal analysis through audience research confirms the effectiveness of the program but conjectures that since their efforts provide "opportunities" for audiences, a sense of stewardship is "likely" to be achieved. The interpretive goal is "likely" to be fulfilled as well. The framework, time, and effort utilized to create this servicewide endeavor require that more than conjecture be applied to the success and usefulness of such a large program.

Lastly, a 2003 article written by David L. Larsen, an interpretive leader from the IDP, suggests, contrary to other studies, that scientific information is not understood or sought after by park visitors (Larsen, 2003). This article and current interpretive leadership trends may provide insight into why the IDP is not attempting to create avenues for scientific and content information to be evaluated. Instead, their efforts are focused on other aspects of communication for achieving the required competencies. The article professes "scientific explanation holds little relevance or power for many, even when they comprehend," with no data to support this claim. Gaskell and others (2006), in contrast, conducted a social survey indicating that two-thirds of Americans put their vote of confidence in sound science. Their study showed the public should be seen as "participants in science policy with whom a shared vision of socially viable science and

technological innovation can be achieved." Larsen, however, with no reference to an information source, claims that audiences do not come to parks seeking knowledge. This statement is empirically refuted by visitor research conducted at Yellowstone National Park by Gyllenhaal (2002) that stated many visitors came to the park to learn something new. Additionally, Larsen claims that science should be interpreted at areas where science "is important," but this clearly only adds to the confusion. Science is mandated to be important at every park site, and interpreters must provide that information to the public in all programs.

Despite the evidence contradicting several apparently accepted core assumptions about why people visit the parks, the IDP does not provide a platform for evaluating the content and accuracy of interpretive programs. It does not seem likely that this component will be added without the inclusion and recognition of visitor survey studies that indicate visitors' desire to pursue scientific information in national parks.

Scientific Research in Parks

If current trends in visitor services do not promote excellence in science communication, what are researchers in the national parks themselves doing? Although a wide range of activities is conducted by scientists to communicate their work, most interpreters never have contact with any of this information. The primary problem is that scientists are mostly concerned with communicating to other scientists (Dewitt, 2006). Studies and results are published in academic journals that potentially do not appear until years after the actual investigations are conducted. The research results rarely cross paths

with park staff. Also, many of these academic publications are difficult to quickly comprehend for interpreters who have a wide range of educational backgrounds and may lack specific education in those research topics examined by the scientists.

Scientific investigations by researchers outside of the NPS can be conducted through a permit system and/or done in conjunction with a Research Learning Center. Research conducted in all national parks requires a permit with reporting guidelines; however, little enforcement exists for meeting these guidelines. Even if a researcher appropriately completes his or her annual report and furnishes the park with any resulting publications, there is still the difficulty of readability and comprehension for interpretive staff that may not have any formal training or education in those specific research areas.

Since the year 2000, 18,699 Investigator's Annual Reports from researchers have been submitted to an online database. The highest reporting year was 2005 with 3900 reports submitted. Reporting requirements for permitted researchers provide a wonderful opportunity for park management and interpretive staff to stay abreast of current research conducted in the parks. Further collaboration among the researchers and park staff needs to be developed to ensure that the majority of information reported is understood by all levels of park staff.

Those researchers who see great value in communicating their work to the park staff and visitors often give formal or informal presentations to one or both of these audiences. Occasionally, these presentations are a result of a park's request or invitation to give the presentation, but, frequently, they are delivered of the scientist's own volition and desire to prepare and present the information. Although these presentations are not

entirely rare, the experience is usually limited to those park staff available to attend an occasional or one-time-only talk. Preserving these presentations in video archives to share with wider audiences is very valuable.

Research Learning Centers were developed out of the 1999 Natural Resource Challenge. The Challenge called for 32 centers to be developed as focal points for research, information exchange, and education. Each center serves multiple parks in a geographic area. The centers are primarily research hubs for conducting scientific investigations in the parks, a purpose echoed by the Research Learning Center website: "Although Research Learning Centers primarily promote scientific research in national parks, the benefits and provisions for educators are exceptional" (National Park Service Research Learning Centers, 2005). The potential for these centers to bridge a portion of the gap between park scientific knowledge and interpretation exists, but, currently, the individual success of each center varies greatly. They have not, unfortunately, become the commonly accepted place for interpreters to gain scientific information.

CHAPTER FIVE

SOCIAL SURVEY STUDIES

Social science surveys conducted on visitor perceptions about parks, educational institutions, and learning shed some much needed light onto the discussion of what the public expects, wants, and understands about science. These studies all indicate that teaching the public scientific information is possible and often expected. They also show the great potential that teaching scientific and preservation information can have for influencing public opinion. These important studies should be better utilized to direct Park Service visitor communications in addition to the management documents and accepted interpretive trends.

Social Science Studies

Studies that help to shape an understanding of the public's scientific interest that may directly impact ideas on national parks include media effects and scientific paradigms. Although many empirical studies indicate that media affects what people think about, not *what* they think, Entman (1989) offers research evidence that this is not the case (Entman, 1989). This research reveals "the media make a significant contribution to what people think – to their political preferences and evaluations – precisely by affecting what they think about." The media contributes to what information is available, and, as a result, shapes the way people can and in turn do think politically. Audience autonomy is not an option because the system of information absorption and

affecting audience opinion is too interdependent. Thus, even by simply providing publicly available information, public or private institutions can influence the public's political opinions. These results suggest that the NPS should consider even more seriously the quality and topics of information content released. The Park Service should also pay close attention to how widely the information is dispersed to the public.

One difficulty in communicating science may lie directly at the heart of current scientific paradigms limiting better comprehension (Patterson and Williams, 1998). A fundamental problem constricting a better understanding of science is that there is a sound conviction that science is about methodology. Methodological pluralism, rising out of a rationalist worldview, has been the existing philosophy guiding science (Patterson and Williams, 1998). Is methodological pluralism an appropriate way to teach and communicate scientific concepts to the public? Methodological pluralism describes science as a systematic set of empirical activities for constructing and analyzing knowledge that also supports a social consensus for the scholarly community. Science as applied to public communication and natural resource management may benefit greatly by critically evaluating this current paradigm along with attention to alternative paradigms as well.

Patterson and Williams (1998) suggest that the gap between the philosophy of science and the practice of science be closed. Environmental psychology and sociology paradigms may be much more appropriate ways to think about science communication and management in national parks. For example, portraying a scientist engaging with their research environment and describing the detailed desire for obtaining answers to

research or management questions may produce a greater learning impact on an audience than expounding on the systematic process of data collection.

National Park Service Studies

Selinda Research Associates, Inc. produced two social survey reports on NPS visitors at Grand Canyon National Park and Yellowstone National Park (Gyllenhaal, 2002 and Gyllenhaal and Perry, 2004). The 2002 Yellowstone National Park report on the Old Faithful Visitor Center indicated that learning played at least a somewhat important role for Yellowstone visitors. Some visitors even said that coming to learn was the reason for the visit (Gyllenhaal, 2002). Perhaps most importantly, the survey points out that "for many of these respondents, learning seemed as enjoyable as any other part of their Yellowstone experience." Information about the park was researched prior to visiting by at least one member of most groups. Surprisingly, a large number of respondents discussed a Discovery Channel special on the Yellowstone "supervolcano." Visitors also wanted several different ways to learn about a topic. Those who did little advance preparation still had an interest in learning about what they were seeing in the park. Many respondents also knew or assumed that scientific investigations were being conducted in the park. Several of the visitors expressed the importance of scientists communicating to the public. The report finds that "visitors seemed to want to stay informed about the intellectual adventure of understanding the park's geology and biology," but they were less knowledgeable about science's role in wildlife conservation and park management.

The Yellowstone report provides a series of helpful recommendations. One recommendation addresses the need to provide different levels of information to the public. Novice visitors need a helping hand with making critical links between major scientific concepts. More advanced visitors should have an avenue in which to refine their expertise. Another recommendation suggests that examples of scientists at work in the park should be made more prominent and, "when possible, scientists should 'speak directly to visitors' in the exhibit through recorded conversations, partial transcripts, and images of them engaged in research" (Gyllenhaal, 2002). Many visitors expected scientists to provide public education and said that, in their opinion, it was an important responsibility of researchers. Additionally, the report recommends that the park should provide examples of scientific applications that are less obvious to visitors such as park management and resource protection.

A 2004 Grand Canyon National Park report was produced that evaluated visitors' responses and needs for a developing interpretive trail within the park (Gyllenhaal and Perry, 2004). The report provides some helpful information about learning in informal settings. Visitors do not shy away from intellectually engaging with park resources. Even when their theories are incomplete or incorrect, visitors utilize a range of higher-level intellectual skills in order to make sense of what they are seeing. It is therefore important to provide information that will bring their theories more in sync with current scientific understanding. One specific recommendation from the report cites that the park should "provide support for answering visitors' factual questions." The report suggests "ways to give docents access to park service approved answers to these questions,

perhaps using hand-held electronics." Another important outcome of the report provides information on less tangible ways that the Park Service plays an important educational role, that of sparking interests and delayed learning. National parks can be partially responsible for learning that takes place far from their initial park experience by sparking a visitor's interest in investigating a scientific topic later in the future. The report also states that "in a national park context, delayed learning becomes even more important when one considers that family and other groups may continue to discuss what they saw and did long after the original experience" (Gyllenhaal and Perry, 2004). Therefore, not only is it important to provide accurate information, but also the parks must provide enough "sparks" of public interest and entertainment to keep the learning and discussion going for as long as possible.

Museum and Zoo Setting Studies

Museum and zoo environments are similar to national parks in that they provide some comparable opportunities for informal learning. Some of these cognitive findings may be helpful for considering what specific ideas the public has gleaned regarding the role of science in public institutions. The information may also be applicable to Park Service areas. One finding indicates that visitors do not think to any great extent or very accurately about the research function of the museum institution (Gyllenhaal et. al, 1996; Gyllenhaal, 1998; Perry and Forland, 1995). Therefore, there is little appreciation for the breadth of collections that exist and the extent of the role that science plays in the facility (Gyllenhaal et. al, 1996). Although there may be little initial knowledge about research

roles and activities, one report states, “once visitors are exposed to these messages, a fairly large percentage of the audience seems to be open to learning about research and related collections” (Gyllenhaal, 1998). This information may be useful for national parks due to the similarity in institutions. Parks frequently maintain large research collections and programs. A scientific exhibit at the National Zoological Park was able to change half the visitors’ minds that had previously agreed that basic ideas of science are too complex to “the basic ideas of science are NOT too complex for most people to understand” (Pekarik, 1998).

In this same study of the scientific exhibit, results found that visitors’ most satisfying experience had less to do with spiritual connections, memories, or ethereal ideas. The visitors responded that “I spent time with family and/or friends, I saw my children learning new things, I felt a connection with the natural world, and I enriched my knowledge.” These findings can be extremely valuable for directing Park Service interpretation if, indeed, these results extend to NPS areas so that visitor service managers could spend more time on providing group intellectual experiences for visitors.

Rand (1996) in her listed “Visitors’ Bill of Rights” indicates that visitors come “to learn something new” (Rand, 1996). Another study suggests that when communicating about science and scientists, visitors respond better to a “scientists-as-people” approach that stresses the passion expressed by these scientists rather than focusing on the research itself (Perry and Forland, 1995). This approach should easily be integrated into Park Service programs that could alter their visitor programming to highlight the scientists behind the research. Lastly, a Smithsonian Institution report found that the only

respondent suggestion that minority visitors as a whole recommended, was that more information be delivered directly by people (Bielick et. al, 1995). Combining the Smithsonian report with the Yellowstone National Park survey suggests that visitors, especially minority groups, would benefit greatly by receiving direct communication from scientific researchers.

CHAPTER SIX

SOME POSSIBLE SOLUTIONS

The status and support for the NPS depends, as with any government agency, on fluctuating political, social, and funding priorities. Government agencies recognize that public support is fundamental to their future work and financing. It is in their self-interest to increase opportunities for the public to understand and engage with their resources. Both exposing visitors to park resources and stressing their scientific value, these unique environments help to ensure that the public will support the agency in the future. As a result, it is imperative that current programs be modified to open new communication avenues with the public who ultimately provide the parks' funding.

Visitor studies have indicated that learning is an enjoyable part of a visitors' experience. For some, it is the main reason for their visit (Rand, 1996 and Gyllenhaal, 2002). Visitors come to parks for a wide variety of reasons, but coming to learn and think about park resources and issues is certainly one of them. A park should provide a deeper degree of scientific substance for those who are seeking it in addition to raising the enthusiasm or knowledge of those not previously inclined to think about scientific topics. Research has shown that the public knows that science is being conducted in the parks and would like to be informed about those scientists' activities. Furthermore, many visitors want the scientists to tell them directly about their scientific discoveries. There is little appreciation among visitors for the less obvious applications of science such as preservation and management (Gyllenhaal, 2002). Therefore, the NPS can go a long way

toward helping preserve the future of their agency by communicating topics and forming connections for visitors about scientific uses in management. The public is constantly influenced about what to think solely by what topics are reported in the media. The Park Service can help influence political and societal decisions by communicating scientific and natural resource management information to the public

Recommendations for Current Programs

The most practical and cost efficient recommendations involve those that maximize the use of existing programs. The Interpretive Development Program (IDP) should add a scientific accuracy component to their evaluations. Ideally, a panel of scientific reviewers from a variety of disciplines should be sought to provide review and feedback about the content of interpreters' submissions. This approach may be difficult logistically, and literature about the IDP indicates that the supervisor and park are responsible for evaluating the accuracy of content. Since the IDP is either not willing or not able to provide the accuracy check, it would perhaps make more sense to support the need for this check by requiring all IDP submissions to contain a signed statement that the program has been reviewed by a member of the park staff for accurate and up-to-date scientific information. If this procedure were not possible, it would seem that the IDP could minimally require a list of references to be included with all program submissions.

Research Learning Centers, if given adequate funding to operate, could institute a public education reporting requirement from the researchers submitted in written, media, or public presentation form. It may even be possible for the centers' staff to provide

periodic written short descriptions and/or audio/video presentations such as “podcasts” on research progress for internet distribution that can be read, listened to, or viewed frequently by park staff and the public.

Scientists conducting research in the national parks could aid in scientific communications to the public by simply submitting their Investigator’s Annual Reports at an information level that may be comprehended by most interpretive park staff. An easy way to inform the staff of these reports is to include hardcopies prior to or at the beginning of seasonal training. Website links or digital copies of the reports should also be included on the park’s intranet webpage.

As I will discuss in detail in the following two chapters, expanding current film and other media uses in national parks can also serve to increase scientific communications to both visitors and park staff. Current film uses for visitors primarily exist as one general orientation movie that describes the features and significance of the particular park site. Occasionally, a visitor center exhibit may have a short film component for visitors to view. Park staff are frequently exposed to three general NPS employee orientation videos during seasonal training that attempt to inspire and instill pride in the workers and are not meant to be informational (Conviction of the Heart, 1992; The National Park Service: An American Mosaic, 2000; National Parks: An American Legacy, 1991).

CHAPTER SEVEN

WHAT FILM AND VIDEO CAN BRING

By both utilizing the recommendations and guidance provided in visitor studies and capitalizing on improving existing park programs, video media communications in national parks can be a perfect solution for revitalizing the Park Service's ability to provide accurate and up-to-date scientific information to the public. With funding increases for technological innovations and video creations possibly on the horizon for national parks (National Park Service, 2007), it is time to "strike while the iron is hot" to ensure that new media adequately supports the service's goal of proper scientific communications. These efforts should be concentrated on the two basic forms of video communication in the Park Service: films and videos designed to meet the unique needs of the public and the park staff.

Films and Videos for the Public

Besides providing a general orientation film for NPS visitors, film, video, and multimedia can fulfill many other purposes, especially in relation to communicating science. Social survey results indicated that the public would like scientists to tell them what is happening with park resources. Although many scientists are unable to frequently meet personally with visitors, a film or video allows a venue in which the scientist directly communicates to the audience. Motion and map graphic presentations of scientific concepts can be invaluable in teaching more difficult concepts about park

resources such as volcanoes, canyon formations, migration, hibernation, and paleoenvironmental descriptions.

Many missed opportunities to educate visitors result from park film presentations not "keeping up with the times." More than one-third of national parks report that their films are outdated; that is, they are more than ten years old (National Park Service Education Council, 2006). Fewer than ten parks reach visitors through online videos, "podcasts", and mobile device presentations. It is possible that the Park Service is neglecting to provide information to a critical audience, the younger generation that frequently uses such avenues to gain video material. The marketplace is exploding with online videos for computers and mobile devices such as YouTube, podcasts, mobile video downloads, streaming media, and daily video updates. These venues, although the NPS now rarely uses them, can be a perfect solution for distributing interpretive media (Koch and Zichterman, 2006). Although the NPS is not known for keeping up with technology, participating in innovative media presentations may be crucial for the agency to support itself in a future society. The new media can help that society better understand the service's mission and, it is hoped, value the resources the NPS protects.

Films and Videos for National Park Service Staff (Primarily Interpretive Staff)

Film and video have the potential to play a major role in educating Park Service staff to enthusiastically and accurately communicate scientific research and topics to the public. Through film or video, interpretive staff can quickly meet Park Service resource

employees or outside researchers, see visual examples of how research is conducted, learn accurate facts and scientific explanations, become aware of “hot button” and/or political issues that face the park, and find out additional information on different topics. Video also gives the scientific community an archived voice to communicate their public education information to the audience most frequently in contact with the public. Also, especially for those interpreters lacking a significant scientific background, a film presentation of all this information may be more easily narrowed to the specific needs of the park and more easily absorbed than written reports, out-of-date textbooks, and academic articles. In a fundamentally practical way, a film or video that displays the scientists onscreen enables new employees to recognize the scientists and know who to talk to for further information. In many parks, there is significant physical distance separating researchers and interpreters. As a result, many members of these important park groups may never meet or understand each other’s respective occupations. The films do not necessarily need to have high production value, but they should not neglect to entertain, inspire, or surprise the audience. These structural and dramatic elements will greatly add to the rate of success at which the information is comprehended and considered for integration into public communications.

In addition to formally prepared video presentations on scientific topics, video documentation of events and programs are also valuable. Scientists tend to give talks or programs to train NPS staff only once during the year or even less frequently. Due to the rate of employee turnover at a park (seasonal, temporary internships, etc.), many employees will never have the opportunity to attend all the presentations that may have

been offered. Therefore, film and video can serve as a way to archive the information so that the presentation can benefit many more employees. Also, in addition to archiving scientist presentations, video documentation of other interpreters presenting engaging and accurate programs to the public will help give less experienced interpreters examples of ways to successfully communicate scientific information to the public.

The dissemination of these videos and the providing of newer updates can be made highly accessible without much effort. Many national parks maintain an intranet site and shared network resources that are accessed by any park computer. This availability of materials removes the instability of providing access to copies and multiple version confusion for the ever-changing employees. Should it seem necessary and feasible, however, disc copies can be mailed prior to an employee's arrival or provided for screenings at trainings. Although many park films for the visiting public exist, there is much to be explored and gained from producing scientific resource information films specifically designed for educating park staff.

Potential Criticisms and Opponents

The obvious criticism for undertaking these video communications lies in the practicalities of budgeting, staffing, and institutional traditions. Lack of sufficient budgeting and staffing for Park Service operations has been a common complaint for decades. Although some park functions have been altered to accommodate low funds, the NPS has continued to conduct essential work including communicating scientific and preservation information to the public. These communication needs should remain a high

priority. The practicality of producing video media for parks has a wide range of budgeting and staffing requirements. The audience and distribution clearly impacts the final budget needs. Videos for the public may require a large budget and staffing crew for theater-style showings; however, many new audiences can be reached by producing smaller budget videos such as those that can be displayed through kiosks, touch screens, websites, and podcasts. Videos for staff may have a lower standard of production quality due to the fact that they may be required to view the video, most likely on government-owned computers, and thus require little budget costs and staff time.

With an adept filmmaker, park staff time can be limited to the equivalent of providing a short training talk. More and more parks and regional support offices employ media or visual information specialists who may be called upon as filmmakers to produce an appropriate level of quality for video production. Although these employees have differing backgrounds and skills, it is possible to find the means to share personnel and equipment resources.

Lastly, institutional traditions provide an arena that often combats new ideas and opposes change. The Park Service can be admired nostalgically as refusing to "keep up with the times," but that does not inherently mean that utilizing older methods are sufficient to achieving critical mission goals in the present. As a government institution, the Park Service has always been dependent upon current and future voters to value the agency to ensure its existence. The NPS should utilize all available means (technological or otherwise) to continue this effort, which in so doing, is practical and responsible.

Video solutions can meet interpretation and communication challenges by providing “personal” services to visitors and other staff by using engaging or informative archived communications. Traditional forms of training staff each season include going through large stacks of papers and binders, hearing talks by various park leadership, and perhaps, hearing a formal or informal talk from research staff. Greater information retention can be gained by embedding video communications on the park staff’s internal websites. Resource personnel can introduce themselves and describe the importance of their study areas. This approach ensures that all staff, whether present at seasonal training or not, would visually be introduced to research staff once they have further settled into their work. These videos can be refreshed with new information quickly without having to decipher written reports. Interpretive staff would always then be easily informed about whom to contact and where to go for further information about resource topics. The films or videos would eliminate the initial learning curve of figuring out the sometimes intimidating employee organizational system that often impedes the task of determining where to go for more help on a topic. Increased video productions will certainly fulfill a large niche of an almost nonexistent form of communication in the Park Service: portable and downloadable video. Providing video content for the Internet and mobile devices reaches a currently ignored but vital marketplace for parks by communicating to younger audiences (Wyn and Cuervo, 2005).

CHAPTER EIGHT

VIDEO EXAMPLE

Black Canyon of the Gunnison National Park and Curecanti National Recreation Area Park Staff Video

As an attempt to provide more accurate and up-to-date scientific information to the public, Black Canyon of the Gunnison National Park and Curecanti National Recreation Area produced short videos to help train interpreters and other staff about park resources. No additional funding was given to the park to complete this work and staff obligations included interview time for two park employed researchers who gave presentations on film as well as the filmmaker's time as the park's visual information specialist. The videos were shot using park equipment. These short films were designed as a platform for scientists and researchers to introduce themselves, communicate current scientific information, discuss "hot button" topics, and provide guidance for further investigations by park employees, particularly interpreters.

The goals of the videos included the following: empowering the researchers to become more involved in what visitors learn about the park; introducing interpreters who work in the park to key topics; offering a basic background understanding of natural resources at the parks; encouraging future communication between the resource and interpretation divisions; and helping the development of clear guidance about where staff can go to find additional information on scientific subjects. In order to produce these videos, bureaucratic and logistical barriers were faced.

The first practical barrier was organizing interdivisional cooperation. The film process requires researchers to devote time and energy away from their regular duties to prepare for an interview. In this case, all the researchers were government-employed and felt an obligation to accurately represent government viewpoints as opposed to their own opinions.

A second limitation was that of personality. Government employees are strengthened by their position as civil servants, but they also tend to hide their personal opinions and feelings behind the uniform. Although this concealment can be appropriate, there is still room for one's personality and interests to shine through. Previously mentioned studies have shown that audiences respond better to scientists as "people" rather than as a cog in the machine. This conflict is exacerbated when the scientist is employed by the institution of government.

"Hot button" or politically heated issues in the parks are difficult for scientists to want to discuss. The most common reaction is to avoid communicating about the issue at all in order to avoid employment repercussions or misrepresenting the agency. Although researchers may have the luxury of frequently avoiding the topics in public, interpreters are confronted with responding to visitor questions about the "hot button" subjects with even less background knowledge than that of the scientific community. This video is only able to speak directly about certain issues while remaining fairly vague about others. This media limitation means that interpreters are still inappropriately prepared to communicate with the public about some topics.

A final barrier is finding a balance between what the researchers want to communicate and how much information is practical for an interpreter to synthesize. As understood in Chapter Three, a seasonal interpreter is tasked with comprehending an immense amount of information that is needed to adequately prepare programs and address visitor inquiries. If the video communicates "just enough information to be dangerous," it can be a problem when this information will be delivered to large visitor audiences. On the other hand, too much information can run the risk of being ignored and rendered useless.

Producing park videos for staff audiences requires background knowledge of agency traditions, core values, bureaucratic realities, and organizational culture. A strong vision to communicate accurate and useful scientific information is important so that the process does not prematurely end due to logistical and political concerns. Also, it is necessary to produce a video that has practical value for the audience and does not provide solely governmental rhetoric.

The Black Canyon of the Gunnison National Park and Curecanti National Recreation Area staff training videos were able to achieve the main goals while still displaying small signs of governmental restraint. There is room, however, for the topics that remained vague to become more developed in the future with the use of "update segments." These low-quality, less than two-minute, update segments will be produced by the park's visual information specialist at the beginning of each major visiting season. They touch base with the researchers in an interview to provide any new information or developments since the original staff training film was produced. The update segments

provide the filmmaker with an opportunity to continue probing the researchers to clarify topics that were not fully explained in the original video.

There is a great need for educating park staff about scientific concepts and preservation ethics so that this information is passed along to visitors. Film and video solutions, such as the Black Canyon of the Gunnison National Park and Curecanti National Recreation Area training videos, can directly address this need if the filmmaker is willing to forge through institutional barriers and create films that inspire, educate, and foster further communication among park staff.

REFERENCES CITED

Bielick, S., A. J. Pekarik, and Z. D. Doering, 1995. Beyond the elephant: A report based on the 1994-95 National Museum of Natural History Visitor Survey. Unpublished manuscript, Smithosonian Institution, Washington, D. C.: 1-36.

Blacoe, J. and R. Fudge, 2003. Standards for Interpretation provide improved visitor experience. Arrowhead: 3.

Conviction of the Heart, 1992. Dir. John Dietsch and Mark Rouse, National Park Service Rocky Mountain Region.

Dewitt, S. L., 2006. Creating Space for Science and Celebrity in the Public Discussion of Climate Change: Master's Thesis, Montana State University: 1-45.

Entman, R. M., 1989. How the media affect what people think: An information processing approach. Journal of Politics, 51(2): 347-371.

The Florida Biodiversity Project v. Kennedy, Case No. 95-CIV-FTM-24(D), settlement approved Feb. 25, 1996 (M.D. Fla. 1995).

The Fund for Animals v. Gale Norton, 294F. Supp.2d 92 (DDC 2003).

Gaskell, G., E. Einsiedel, W. Hallman, S. H. Priest, J. Jackson, and J. Olsthoorn, 2005. Social Values and the Governance of Science. Science, 310: 1908-1909.

Gyllenhaal, E. D., 2002. Old Faithful Visitor Center Yellowstone National Park front-end evaluation: Final report. Unpublished manuscript, Yellowstone National Park, Mammoth, WY: 1-100.

Gyllenhaal, E. D., 1998. Communicating behind-the-scenes research to museum visitors: Evaluations of temporary exhibitions at the Field Museum. Current Trends in Audience Research and Evaluation, 11: 15-24.

Gyllenhaal, E. D. and D. L. Perry, 2004. Phase one of formative evaluation for the Trail of Time at Grand Canyon National Park for University of New Mexico and Grand Canyon National Park. Unpublished manuscript, Selinda Research Associates, Inc., Oak Park, IL: 1-58.

Gyllenhaal, E. D., D. L. Perry, and E. Forland, 1996. Visitor understandings about research collections and behind-the-scenes at the Field Museum. Current Trends in Audience Research and Evaluation, 10: 22-32.

Koch, A. L. and P. J. Zichterman, 2006. Innovative strategies to develop interpretive media for paleontological sites at Curecanti National Recreation Area, Colorado. New Mexico Museum of Natural History and Science Bulletin, 34: 81-83.

Lacome, B., 2003. Analyze *This!* Analyzing and measuring interpretive effectiveness. Proceeding Paper for the National Interpreters Workshop: 1-4.

Larsen, D. L., 2003. Be relevant or become a relic. Journal of Interpretation Research, 7(1): 17-23.

Longino, J. T., 2005. Revisiting the Grand Canyon. Science, 310(5748): 619.

National Parks: An American Legacy, 1991. Harpers Ferry Center, National Park Service.

National Park Service, 2007. National Park Service Interpretation and Education Renaissance, Draft Action Plan: National Park Service, Washington, D. C.: 1-12.

National Park Service, 2005. Director's Order #6: Interpretation and Education. National Park Service, Washington, D. C.: 1-16.

National Park Service, 2004. Reporting requirements for natural resource programs: Reporting and accountability measures, instructions for field. National Park Service, Washington, D.C.: 1-8.

National Park Service, 2001. Management Policies. National Park Service, Washington, D. C.: 1-232.

National Park Service, 1999. Natural Resource Challenge: The National Park Service's action plan for preserving natural resources. National Park Service, Washington, D. C.: 1-27.

The National Park Service: An American Mosaic, 2000. Harpers Ferry Center, National Park Service.

National Park Service Education Council, 2006. Interpretation and Education Program Business Plan. National Park Service, Washington, D. C.: 1-60.

National Park Service Interpretive Development Program, 2003. <http://www.nps.gov/idp/interp/index.htm>

National Park Service Research Learning Centers, 2005. <http://www.nature.nps.gov/learningcenters/>

National Park Service Research Permit and Reporting System, 2006. <http://rprs.nps.gov/research/ac/ResearchIndex>

National Park Service Visitation Database Reports, 2006. <http://www2.nature.nps.gov/npstats/npstats.cfm>

Patterson, M. R. and D. R. Williams, 1998. Paradigms and problems: The practice of social science in natural resource management. Society & Natural Resources, 11(3): 279-295.

Pekarik, A. J., 1998. Exploring Amazonia: Three studies of visitors at the National Zoological Park. Institutional Studies, Smithsonian Institution, Washington, D. C.: 1-57.

Perry, D. L. and E. Forland, 1995. The Exploration Zone at the Field Museum: Front End Evaluation. Unpublished manuscript, The Field Museum, Chicago, IL: 1-45.

Rand, J., 1996. The 227-mile museum, or, why we need a Visitors' Bill of Rights. Visitor Studies: Theory, Research and Practice, 9: 8-26.

Risk, P., 1994. The search for excellence in interpretive training: Legacy 5(6): 8-10.

Ruch, John. Letter to National Park Service Director Mary Bomar, December 28, 2006.

Seasonal Training, 2006. Black Canyon of the Gunnison National Park and Curecanti National Recreation Area: Hosted by Heather Boothe and Paul Zaenger.

Wyn, J. and H. Cuervo, 2005. Young people, wellbeing and communication technologies: Report for the Victorian Health Promotion Foundation, Youth Research Center, The University of Melbourne: 1-49.