

Program Integration

Interpreting Critical Resource Issues



Training for the Future

Michael Whatley
Cape Cod National
Seashore

Through interpretation, understanding; through understanding, appreciation; through appreciation, protection.

Unknown

William Springer
Chief of Interpretation
Southeast Region

Rachel Carson, Barry Commoner, Paul and Anne Erlich, Lynton Caldwell, The Club of Rome, and a host of others in the 1960s and early 1970s provided much food for thought on environmental management and mismanagement. The "environmental awareness" of this period produced a spate of environmental legislation, including one law that set a national policy of working to protect the environment. In establishing this policy, Congress acknowledged that the public has a right to a healthful environment, but Congress also claimed that the public has a responsibility to help preserve and enhance the environment.

Few members of the general public devote time to reading legislation in order to define individual responsibilities. However, the environmental education efforts of the 1970s were one means of focusing on environmental responsibility. Environmental interpretation spoken of in *Islands of Hope* was another concept for conveying environmental information, stimulating discussion, and ideally motivating the public toward preserving and/or enhancing the environment. The idea was to start with park visitors and park resources but provide a forum for discussion of larger environmental issues.

Heightened awareness was apparent as attention was devoted to measures such as enhancing air and water quality levels, erosion control, alternatives to chemical pesticides, and endangered species protection. Although some gains were made in the United States in implementing our national policy of environmental protection, the global outlook into the 21st century indicates issues of air and water pollution, habitat loss, species reduction, erosion, and energy needs will continue. These are some of the same issues facing National Park Service management today.

Thus, the environmental issues emphasized during the last two decades remain with us along with the need to be aware of these issues and to work collectively in the hope of resolving them. Director William Penn Mott, speaking at the 1986 Conference on Science in the National Parks, stated: "It is not enough for us to gather knowledge. It is not even enough for us to apply that knowledge. It is essential that we share our knowledge with the people of the nation and this world." Point 3 of the Service's 12-Point Plan challenges us to implement this through the integration of research,

Interpretation

resource management, interpretation, and public information. The idea is to communicate information on critical resource issues to the public and motivate them to help with solutions. The idea sounds a lot like the goal and process of environmental education and "environmental interpretation" of the 1960s and 1970s.

Likewise, the idea, or at least the hope, of interpreters working with researchers and resource managers is not new, although there is an agency-wide emphasis on such program cooperation and integration. A manifestation of this recent emphasis is the development of a series of workshops addressing "Critical Natural Resource Issues Interpretation." Initiated in late 1987, the goal of these workshops has been to increase the awareness of critical natural resource issues among interpreters, improve communication between interpreters and resource management personnel, and increase support for, and attention to, park science efforts. In addition the program is intended to equip field interpreters with the ability to discuss critical resource issues in their parks in a creditable manner as well as to produce effective interpretive services (personal and nonpersonal) that address critical resource issues. These products have proven useful not only in the trainee's park but as models for other parks as well.

Trainees to the first course came from as far away as the Virgin Islands and Hawaii. Representatives of the National Parks and Conservation Association were present, as was Gary Mullins of Ohio State University, who offered insights into his study of the integration of interpretation and natural resources management. The course was coordinated by Kim Sikoryak and Michael Whatley, who undertook this project as part of a three month detail to the Washinton Office of Natural Resources. Program instructors included Dick Cunningham, Chief Interpreter for the Western Region, who has been responsible for convening a variety of cooperative workshops for interpreters, resource managers and scientists. Bill Gregg, the Service's coordinator for the Man and the Biosphere Program, Gene Hester, Associate Director for Natural Resources, and Ken Raithel, Assistant Director for Interpretation, presented organizational viewpoints and information that were both enlightening and thought-provoking for participants. Ted Sudia, senior scientist for the Service, and Milford Fletcher, chief scientist of the Southwest Region, discussed the agency's resource management mission and the constant need to seek and rely on facts in program communication.

Case studies in interpreting resource issues such as sea turtles at Padre Island, dune habitat/restoration at Indiana Dunes, and urban ecosystems at Gateway were presented. An interesting review of innovative underwater programs was presented by the team from Channel

Islands.* Another notable presentation on the competition between exotic species and endangered native species in Hawaii blended humor, empathy, realism, and audience participation.** The program was especially effective as a method of explaining and gaining support for the Service's policy of exotic species control.

Once the organizational goals, viewpoints, and examples of practical applications for interpreting critical resource issues were presented, the training turned to "hands-on" development of interpretive programs. Resource people from Harpers Ferry Center were on hand to give advice and support, and the result was an array of high-quality interpretive treatments.

These interpretive treatments ranged from design considerations for bulletin boards on which to post resource management and protection messages to site bulletins, wayside exhibits, videotapes, slideshows, and live talks and demonstrations. The final products of the course are to be included in a special compilation of examples for interpreting critical resource issues. This compilation will be distributed Service-wide.

Thus, a formal training program has begun that provides for integrating science, resource management, interpretation and public information. The products of the training are skills in translating messages and developing appropriate media for the messages to be understood and appreciated by the public. Sharing our understanding of critical resource issues with the public is intended ultimately to help the National Park Service preserve and protect the resources and values of the National Park System. Field interpreters, as principal communicators with the public, are the logical members of the management team to carry out this function.

A few years back, Director Mott shared his view of the importance of interpretation. He said:

By creating an identification with our parks' resources, an emotional involvement with and commitment to actively supporting and helping preserve them . . . , interpretation can be the most cost-effective management activity we have in the Service.

Freeman Tilden articulated a similar view when he said:

Not the least of the fruits of adequate interpretation is the certainty that it leads directly toward the very

*See: Cindy Nielson, "A Guided Walk Through the Kelp Forest: Underwater Video at Channel Islands National Park," in this issue of *Interpretation*.

**See: Martha Lane, "Biodiversity in Island Ecosystems," in this issue of *Interpretation*.

preservation of the treasure itself Indeed, such a result may be the most important end of our interpretation, for what we cannot protect we are destined to lose.

The issues, preservation/protection goals and interpretive concepts are not particular to the 1980s; they have been around for years. What is current is the heightened interest in working to meet the mission of the National Park Service through more effective and efficient integration of science, resource management and interpretation. The skills gained through training courses such as "Critical Natural Resource Issues Interpretation Workshop" are intended to help provide that effectiveness and efficiency. The results are expected to be better interpretive services and ultimately better resource protection/preservation. There is no better time to get on with the job and the challenge. Meeting the challenge can only help the resource and the public as we move into the 21st century.

Interpreting Resource Management Issues in the Great Smoky Mountains National Park

Stanley G Canter
Chief of Visitor
Services
Great Smoky Mountains
National Park

John D Peine
Director
Uplands Field
Research Laboratory
Great Smoky Mountains
National Park

William P Gregg, Jr
Coordinator
Man. and Biosphere Program
National Park Service

Gary W Mullins
Associate Professor
School of Natural Resources
Ohio State University

Kimberly L Tassier
Graduate Associate
School of Natural Resources
Ohio State University

Introduction

We often spend a tremendous amount of time theorizing how to integrate concepts such as resource management, marketing, communication theory, and interpretation. However, finding the time and resources to implement such plans are major problems. This paper focuses on an effort of the Great Smoky Mountains National Park to implement a well-planned program to interpret resource management issues. This program targets a variety of client groups with critical resource messages and uses the park's biosphere reserve designation as a theme.

Statement of Problem

In the past few decades, there has been an increased awareness of the dependency of human beings upon the natural environment. Environmental legislation flourished in the late 1960s and early 1970s in the United States as a result.

*Global 2000 Report to the President*¹ called for the world to act decisively to secure life on earth in the year 2000. Along the same lines, efforts of public resources-management agencies depend not only on effective planning, administration, and management, but also on the support of an informed clientele.² Without an informed clientele, resource-management programs and necessary legislation to support them are threatened. Interpreting research results and resource-management issues is an important part of a park's interpretive program, helping the agency meet its management goals.

The literature is replete with calls for communication with key audiences, marketing resource management concepts, and educating students about resource-related issues. Yet, limited implementation exists today. This paper describes how one park has begun to address the problem of implementation.

Communications and Marketing

One approach to interpreting resource-management issues in order to garner support for the goals of the National Park Service is to study communication theory and the practical application of marketing strategies. These two bodies of knowledge can aid interpreters in thinking through the process of how to reach their clientele.

Communications are considered to be both the process by which meanings are exchanged between individuals and the technology by which such information is transmitted. These terms encapsulate the driving forces behind a successful interpretive program. The most important element is that communication is a two-way process. At its best, it is a dynamic, interactive process. Communication planning provides an ideal model for organizing strategies for clientele involvement.

The process for communication with the public, both local and visitor publics, usually follows a similar format.

- 1 Identify general resource management issues in which the public can play a legitimate role.
- 2 Develop specific message objectives on the issues, and incorporate perspectives from the community, visitors, and resource management into the definition of objectives.
- 3 Analyze the clientele's economic and social structures to identify the orientation of vested interests, categories of networks, and individual leaders concerning each issue, public interest, and behavior.
- 4 Select target audiences for specific messages.
- 5 Design specific cost effective programs and media applications to link the messages to target audiences and receive feedback.
- 6 Program an implementation phase.
- 7 Analyze the effectiveness of the messages and programs in meeting the intended message objectives.

Clearly, there is a danger in listing a process as a series of steps. The steps are not mutually exclusive but, rather, highly integrated. They are all interdependent, making for a dynamic process.

Clarke, Schellinck and Leonard provide one of the better approaches for applying communication theory in their discussion of how to change environment-related consumer behavior.³ Their paper approaches the problem based on an attitude-behavior discrepancy model and offers strategies for actually dealing with the clientele. The four strategies they present address: (1) reinforcing positive, existing behavior; (2) inducing the desired behavior where positive attitudes exist but the corresponding behavior does not; (3) persuading when the behavior is acceptable but a negative attitude exists; and (4) confronting where both a negative attitude and a negative behavior exist. This work provides one basis for assessing the Great Smoky Mountain National Park audience and implementing appropriate programs.

Marketing theory, although similar to communication theory, tells us to assess all of the actors (ie, people, environments, technologies, organizations), define the needs of the actors, and develop products to meet those needs. Whether consciously or subconsciously, interpreters and resource managers of NPS areas engage in marketing. Only in the past decade has the concept of marketing evolved from the public misconception of a shady selling technique to recognition as a legitimate function of business. Interpreters and other resource managers are now viewing their role as a business function; thus, marketing is playing an increasingly important role in resource-management organizations.

By definition marketing is a system of exchange, ie, exchange for the purpose of accomplishing goals. Traditionally, marketing is a system of attracting sufficient resources; converting resources into products, services, or ideas; and distributing the items to targeted consumer groups. Each gives up something for something else of higher value to them. Marketing incorporates price, place, position in the market-place, product, and promotion as key elements that must be integrated to ensure success.

The potential exists for GRSM to use communication theory and marketing approaches to convey resource management concepts. GRSM has a mission to provide for the use and enjoyment of its resources in a manner which will leave those resources unimpaired for future generations. Accordingly, Great Smoky Mountains's products are the opportunities for use and enjoyment of its diverse natural and cultural resources. These opportunities are to be provided for two broad market segments--present and future generations of visitors and local communities--in such a manner that benefits realized by one group will not impair benefits which may be realized by succeeding groups.

Benefits sought by the GRSM clientele vary, but for most persons they are defined as simply enjoyable,

Interpretation

resource-related, leisure experiences. However, it should be noted that there are differing opinions as to what constitutes enjoyable use of the park's resources.

Opportunities for use and enjoyment of the park's resources are provided by the cooperative efforts of administrative, maintenance, resource management, ranger activities, and visitor services divisions. Facilitation of enjoyment and use by present users is a secondary objective for most divisions. Even those divisions which consider the visitor first in fulfilling their assigned roles do so within the constraints of founding legislation and Service-wide policies, goals, and objectives. Visitors have been provided with opportunities considered appropriate and desirable by GRSM and corresponding NPS enabling legislation.

Adoption of the marketing concept, with its emphasis on consumers (rather than just resources or organization factors), is enabling the GRSM staff better to fulfill its mission of protecting the resource. Appropriate marketing aids the park in gaining public support to manage better critical resources such as the southern Appalachian airshed and the biological diversity found in the park. A well-informed public can be more valuable, perhaps, than all of the other management tools used to mitigate human generated impacts.

Implementation

Figure 1 outlines the GRSM's effort to interpret critical resources in the context of its total mission.

Figure 1

GRSM RESOURCE MANAGEMENT INTERPRETATION PLAN

Park Resource Management Issues	Man and the Biosphere Air Quality and Acid Rain Deposition Native Species Exotic Species Biological Diversity Cultural Heritage
Objectives	To instill an understanding and appreciation of the park and its resources, which will lead to public support for preservation of the park's resources To exchange information necessary to ensure the successful adaptation of visitors to park environments and to encourage and facilitate appropriate, safe, minimum impact use of the park's resources.
Analysis	Provided by the Uplands Field Research Laboratory (GRSM) and other sources.
Audience	Local Communities (To be segmented as more specific messages are developed.) School Children (Grades K-8). In-park Visitors (To be segmented as more specific programs are developed.)
Implementation	To be carried out primarily by Visitor Services staff (GRSM); local K-8 schools; Great Smoky Mountains Institute.
Evaluation	To be carried out primarily by Uplands Field Research Laboratory (GRSM) staff, School of Natural Resources, The Ohio State University, and other cooperating researchers.

GRSM has targeted three main groups:

- The communities surrounding the park
- Public schools surrounding the park
- Visitors to the park

Often, the groups are overlapping, but the planner who markets messages must identify an audience at a specific time and setting. This, park personnel are doing.

To target the community, a number of steps were taken. First the park, through its scientist, contracted for a manual entitled "A Strategy for Community Involvement in Man and Biosphere Programs."⁴ That document outlined a program that describes how park personnel can use communication and marketing theory to work with the local communities. The manual uses examples of how to interpret critical resource management issues, such as bear management problems, to the total community.

Beginning June 1987, the science, resource management, and visitor services units within the GRSM pooled resources and created a temporary special science/resource communications position. The person would be assigned to communicate critical management issues to the communities and park visitors. That person field tested the community manual and developed prototype programs. This position has since been converted to a permanent full-time position in the Division of Visitor Services.

Using funds earmarked to support a special Man and the Biosphere air quality/acid deposition interpretive thrust, the GRSM is developing a thirty-minute community-oriented module that will focus on the community's role and responsibility in managing the air in and around the park. For off-site visits the module will include a five-minute introduction by NPS personnel, a ten-minute slide/sound presentation, and a suggested format for a fifteen-minute round-table discussion on actions and reactions regarding air issues management.

GRSM seeks to reach the student in two ways. First, the park provides traditional off-site programming for schools when personnel and funds are available. Second, the park and its cooperating association sponsor the Great Smoky Mountains Institute--a resident environmental education camp in the Park.

To help expand on these efforts, the City of Gatlinburg, Tennessee, funded The Ohio State University to develop a set of Man and Biosphere education materials for the Sevier County elementary school district (see Figure 2). The Science, Visitor Services, and Resource Management Divisions of GRSM provided advisory services and housing to the developers of the material.

Evaluation of the modules entailed different approaches. Formative review was conducted by experts from content

Interpretation

areas and education, the park visitor services staff, and teachers participating in the Great Smoky Mountains Institute's summer workshops. Formal in-class evaluation by teachers and students was conducted in October 1987. Final evaluation will be by the teachers and students to whom the materials are distributed.

Figure 2

MAN AND THE BIOSPHERE EDUCATION MODULES

<u>Topic</u>	<u>Grade</u>	<u>Module Title</u>	<u>Topic Heading</u>
Man & The Biosphere Program	6	Around the World, Across the United States, and In the Smokies	-
	3	The United Nations, The Man and the The Biosphere Program, and the Great Smoky Mountains National Park	-
Air Quality	8	Air Quality in the Smokies	The What and Where of Air Quality!
	8		Acid Rain in the Smokies
	8		The Infamous Ozone!
	8		Law and the Smokies
	4	Pollution Sense Search	-
	3	Let's Sock Car Exhaust!	-
Native Species	5	The Great Smoky Mountain Bears!	-
	1	How the Peregrine Falcon and The River Otter Came Back to the Smokies	-
	1	Who Goes Where?	-
Exotic Species	7	Exotics in the Smokies	The Who, What & Where of Exotics
	7		European Wild Hogs
	7		The Brook Trout vs The Rainbow Trout
	7		Aphids, Fraser Fir and Mountain Top Life
	2	How Do We Get More Plants?	-
Biodiversity	6	Biodiversity in the Smokies	-
	3	The Many Habitats of the Smokies	-
	K	Lots of Leaves in the Smokies	-
Cultural Heritage	7	The Principal People of the Great Smoky Mountains: The Cherokee	-
	5	Make Do or Do Without	-
	4	Lifeways of the Cherokee	-
	2	Lifeway Changes	-
	K	When Great, Great, Great Grandma Was a Little Girl	Childrens' Games of the Cherokee and White Settlers
	K		School Days at Little Greenbriar

To multiply the impact of the modules, the GRSM is purchasing and distributing 250 sets of the modules to all K-8 schools surrounding the park. Plans are being made for conducting Tennessee and North Carolina workshops on how to use the materials in the classroom.

By addressing park-related issues at both the community level and at the school level, the parent-child interaction could support an exchange of information and reinforcement of learning. Such effort is based on the mass media concept that repetition of a message tends to heighten its importance to the listener.

While the park seeks to serve the broader local community and school children, it must also focus on the more traditional interpretive client--the park visitor. With millions of visitors per year, GRSM has a responsibility to educate the visitor concerning the park's opportunities, compatible uses, resource values and management concepts. Proper use and protection by the visitor are primarily products of enlightened visitors.

In addition to traditional park interpretive programming, GRSM had two full-time researchers working in the park during the summer of 1987 to develop and test air quality/acid deposition interpretive programs. The findings of these researchers will not only support the effort to expand interpretation of this topic but will also serve as part of a national model for NPS interpretive programs during 1988. The 1988 designated topic is Air Quality/Acid Deposition. Such programs include guided walks, stream exploration, campfire talks, special science research day, roving interpretive activities, brochure inserts, signs, and interpretation of scientific instruments. For the most part air quality and acid deposition materials are integrated into programs on flora, fauna, ecosystems, management, and similar topics as opposed to full programs which have dominant themes of air quality of acid deposition.

For 1989, Biological Diversity, a special Service-wide initiative, is planned. GRSM is actively pursuing a leadership role in developing and testing prototype programs and materials.

The special science resource communicator (interpreter) hired by GRSM is also playing an active role in in-park interpretation. For example, control spraying of the balsam woolly adelgid, an aphid, disrupts visitor traffic. This disruption opened an opportunity to interpret. The science/resource communicator developed special materials to explain to visitors what was taking place. Additional topics that the science/resource communicator will focus on in the coming seasons are air quality, acid deposition, biodiversity, and bear management. Implementation and evaluation are underway.

These efforts are supported by non-personal interpretive services such as publications, a new wayside exhibit describing community activities which address critical resource issues, and the community. The park staff continues to add new elements to these endeavors to ensure that the effort does not become static.

Conclusions

The programs and audiences addressed in this paper represent a formative research approach on how to identify a set of concepts and target audiences for those concepts. Resource management issues were identified and specific messages were designed. Objectives were

set, and on-going research at the park provided the necessary visitor and community data to serve as a basis for this first stage of communicating the desired messages. The audiences were identified and messages and media were matched to the audience. Early recognition was and is being given to considerations of how to best communicate, which strategies should be used, and where and how to market the NPS product.

An on-going evaluation is planned. At this stage of materials development and implementation, the evaluation has been formative. Student and teacher evaluation of the education modules is underway. Evaluation of other components will follow.

Multiple organizations supported various pieces of the project, yet all benefited from the total project. The effort is only a beginning; the evaluation of each piece of work will provide a basis for influencing the existing messages and developing new messages for new clients. Interpretation, like all aspects of resource management, must not just happen; it must be planned.

¹Global 2000 Report to the President, Vol. 1, Washington, DC, 1980.

²E C Olson, "Nonformal Environmental Education in National Resource Management: A Case Study in the Use of Interpretation as a Management Tool for a State Nature Preserve System," unpublished dissertation, The Ohio State University, 1983.

³T K Clarke, D A Schellinck, and Thomas L Leonard, "Developing an Effective Communication Strategy to Modify Environment-Related Consumer Behavior," *International Journal of Advertising*, IV:2 (1984), 105-118.

⁴John D Peine, Gary W Mullins, and Gabriel J Cherem, "A Strategy for Community Involvement in Man and Biosphere Programs," Uplands Field Research Laboratory, Great Smoky Mountains National Park, 1988.

Biodiversity in Island Ecosystems

Martha Lane
Park Ranger
Hawai'i Volcanoes
National Park

Hawai'i: A Modern Mythconception
Plumeria, gardenia, and yellow ginger; pineapples, kona coffee, and macadamia nuts . . . no place to take leave of your senses, anticipate the overload. Incited, excited, we are possessed, like Mark Twain, by a poetry of Hawaiian memories:

and so beseechingly haunt me . . . sleeping and waking, through half a lifetime . . . other things leave me, but it abides . . . in my nostrils still lives the breath of flowers that perished twenty years ago.

We smell, we taste, we will remember all that Hawai'i was meant to be . . . and yet, never was. All our experiences, all our interactions are, for the most part, non-native, alien encounters.

Hawai'i's roadside residents, the mongoose and the mynah, hail from India. Pineapple and papaya are tropical American. The coffee's African, the nut's Australian, and even the plumeria in the lei at the airport stand is an Asian import.

What does it really matter? Should anybody care? Is an alien fruit less sweet? Is an alien flower any less fragrant? Overshadowed, overwhelmed by all things alien, is Hawai'i.

Pig Tales

"This little piggie went to market, this little piggie stayed home . . ."

And that little piggie, at home in Hawai'i Volcanoes National Park, is a critical alien management concern. And a timely interpretive theme.

The first pigs (*Sus scrofa*), brought to the Hawaiian Islands by Polynesians nearly 1,500 years ago, were small domesticated animals. European wild boars were introduced to the Islands in the late 18th century. They became feral (wild) and spread into grasslands, open-canopy woodlands, and closed-canopy forests. Wild pigs pose a serious threat to endemic (unique to Hawai'i) plants and animals, and may be the greatest current modifiers of Hawai'i's remnant native forests.

Pigs with selective appetites prefer certain native plants. Ferns and tree ferns, orchids, violets, lilies, and other Hawaiian endemics evolved in the absence of mammals (except for a bat and a seal), reptiles, and amphibians. Their defenselessness is obvious in the contradiction of terms used to describe the island's vulnerable life forms . . . nettleless nettles, mintless mints, briarless greenbriars, and stinkless stinkbugs.

The pig, a secretive, highly adaptive opportunist, seeks and destroys native plant communities without regard for rare or endangered status. Rooting and rutting, digging and degrading, pigs eliminate endemics, and spread and fertilize aliens.

Another alien menace, the mosquito (*Culex quinquefasciatus*), breeds in water that collects in pig wallows, and eaten-out tree fern hollows. Mosquito bites infect

birds with microorganisms causing avian malaria and bird pox. Hawai'i's native birds, with little or no natural immunity, suffer death and disfigurement.

Old songs go unsung. New voices sing a foreign verse. Hawai'i's band is out of tune, and playing out of time.

The Boar Wars

During 1,500 years of human immigration and settlement, largely due to alien invasions and habitat destruction, 63 uniquely Hawaiian bird species (owls, geese, rails, eagle, honeycreepers) have faced the finality of extinction. Nearly three quarters of the documented extinctions in the United States are Hawaiian species; more than half of Hawai'i's original bird species are gone.

Today, Hawai'i is home to 25% of all the endangered plants and birds in the United States. Six endangered bird species seek refuge in Hawai'i Volcanoes National Park, dependent directly on the remaining portions of native habitat now under siege by alien invaders.

Pig sign sounds an intruder alert that cannot be ignored. Park policy mandates preservation and restoration of natural processes. Inaction would violate legislation as reflected in the Park's Master Plan, and Endangered Species and Wilderness Acts, and would compromise Park status as an International Biosphere Reserve and World Heritage Site.

A call to arms resounds, the research/resource management team responds. Park boundaries are re-surveyed and marked. Pig-proof fences are erected and maintained. Hunters are hired, dogs are trained, the traps are baited, and the snares are set. The pig war is underway. Now who will rally the allies?

A Home Court Advantage

Any Park management program aimed at the control or killing of plant and animal life has a chronic, potentially fatal (to the program) side-effect . . . the generation of controversial public opinion. When a decision is made to act or not to act upon a resource problem, an audience reaction is presumable, but not predictable. By stimulating human emotion and personal values, management activities impact visitors' views of Park operations. And some operations proceed only as far and only as fast as public opinion allows.

Communicators, seeking an offensive edge, should anticipate the depth of controversy inherent in critical resource decisions. It is those very management programs, subject to confusion and conflict, that merit high priority in interpretive planning.

The Pig Under Glass

Up front and center, strategically located on the garden

Interpretation

lanai (patio) of the Kilauea Visitor Center, a pig exhibit and accompanying text expose 1.8 million visitors annually to the Park's pig problem and solutions. Hawai'i Volcanoes' interpreters proposed the showcase, and then thought, "Why go it alone?"

Innovation and imagination, talent and teamwork--all positive attributes of interdivisional cooperation, a necessity of Park life on the earth's most isolated islands. Park biologists snared the pig while botanists landscaped the pen with pig damaged tree ferns. Carpenters framed and partially enclosed the display while electricians wired the night lights and set the automatic timer. Maintenance personnel weed, water, and wax. And interpreters keep the pig's tusks polished, his coat brushed, and his hide water repellent with a quick spray of Scotchgard.

In neon moonlight or sunlight, twenty-four hours a day. Hawai'i Volcanoes' pig management program is on display. Winning startled glances and lingering looks, this posed pig in his plexiglass pokey is a most popular wayside exhibit. Two hundred pounds of ecological problem has become one part of an interpretive solution.

Hawai'i's homogenizer of soils and systems will be an effective counterpoint exhibit in the year of Biodiversity. He is primed and primed for 1989.

Port-A-Pig

In a continuing effort to bring the pig to the people, interpreters explored off-site delivery methods. An appeal to Resource Management yielded a one-hundred pound alternative--port-a-pig. Lightweight and compact, this pig in the hand, turned pig in the van, is a real road hog.

Packed into the forest or into the classroom, his brawn and biology stimulate lively discussion. Port-a-pig draws attention to alien animal control methods and objectives at neighboring schools, teachers' seminars, summer children's programs, Audubon bird counts, and island ecosystem workshops.

Initially, port-a-pig's fame was not recognized by the Volcanoes Park staff. It hit home hard when Haleakala National Park called for a back-up interpreter at the Maui County Fair. Dangling airfare, lodging, and ground transportation, and three days on the Valley Isle all expenses paid, they had but one staffer in mind, "Just send port-a-pig!" The mileage points add up for this frequent flyer. An award is due. Nowadays, pigs can fly. And at least one has earned his first-class upgrade.

A Breed Apart

Interpreters are challenged by Service-drawn directives to share understanding of critical resource issues with the public and to "illuminate" their meanings and rela-

tionships. What wattage is recommended? How many foot-candles required? Do we flip a switch, or hurl a bolt of lightning?

An inspired part of the management team, interpretation is charged to win public acceptance of progressive resource policies. An enlightened visitor more aptly supports active management for environmental quality.

Interpreters who continually strive to develop skills and integrate critical issues into their interpretive programs are a breed apart.

Their skulls are not yet available to museums, but even a layman can see that their brains are distinctive.

Aldo Leopold

Distinctive enough to know, after all, whether "alien flowers are really as fragrant."

A Guided Walk Through the Kelp Forest: Underwater Video at Channel Islands National Park

Cindy Nielsen
Chief of Interpretation
Channel Islands
National Park

Throughout the National Park System, rangers lead visitors on guided walks to explore pine forests, mountain meadows, desert washes, and historic homes. Channel Islands National Park interpreters have added an innovative twist to the time-honored tradition of the guided hike. At Anacapa Island's landing cove, diving rangers in wet suits and SCUBA gear regularly lead a guided "Walk Through the Kelp Forest." Visitors venture below the surface of the sea without ever getting their feet wet. Combining high tech video and diving equipment with personal interpretive services enables park staff to meet the unique challenge of bringing the remote, submerged resources of this island park to visitors live, and in person.

Marine resources, perhaps more than most others, suffer from an out-of-sight, out-of-mind syndrome and a misperception of limitless abundance. It is difficult to get folks excited about preserving what they cannot see, touch, and hear. One of the most difficult interpretive and philosophical challenges facing the Service today is how to develop a conservation ethic for resources beyond the public's reach. How do we expose urban dwellers to the wonders of remote wilderness? How do we share the values of unimpaired ecosystems with people who cannot experience them firsthand? Direct access to submerged ecosystems in particular is denied to all but a select few. The Underwater Video Interpretive Program brings Channel Islands visitors one step closer to a firsthand experience in a new environment, the kelp forest.

Interpretation

The purpose of the Underwater Video Interpretive Program at Channel Islands is to acquaint the non-diving visitor with the diversity and beauty of the marine environment. Our goal is to perpetuate the ethic that are marine areas worthy of complete protection. Marine resources are an integral part of the park story.

Of the 248,000 acres within park boundaries, 124,000 are submerged. The other 124,000 acres are islands. To ignore the marine ecosystem is to miss half the park. Visitors to Anacapa Island view the often unseen world of kelp forest and rocky reef through the use of an underwater video camera, a two-way audio communication system, and surface video monitors.

During the program, visitors see what the diver sees. They can ask questions of the divers, receive immediate replies from forty feet below the surface, and relate what they hear to what they see on the dock-side video monitors. The marine resource is no longer hidden below the surface, no longer out-of-sight, out-of-mind. The Underwater Video Program is an ideal example of integrated park interpretation, research, and resource management programs. The equipment used in the program was developed by park marine biologists to record data for their kelp forest monitoring project. Long term monitoring programs were established at Channel Islands to supply baseline data on the dynamics of natural ecosystems. Park managers use information gathered about resource conditions to make decisions affecting ecosystem health, to develop long-range strategies which protect park resources, and to evaluate potential threats to park resources.

Kelp forest ecosystems were one of the first resources targeted by park research scientists who designed and implemented the monitoring program. After five years of research, the design study is complete and the resource management staff has assumed responsibility for long term monitoring. Island rangers form part of the cadre of divers and scientists who collect and record data. Park interpreters gain a new challenge and new information to supplement their marine interpretive programs.

The role of park interpretation in this program is twofold. Channel Islands interpretive programs seek both to impart often complex information about the marine resource to park visitors and to convey a sense of the choices that the American public must make daily affecting the integrity of the plant and animal communities of the coastal Pacific. More than a thousand species--seals, sea lions, algae, fishes, and marine invertebrates--live in the first sixty feet of the water column in a kelp forest. Their survival depends on public decisions about off shore oil drilling, coastal development, commercial kelp, fish and shellfish harvest, recreational SCUBA and charter boat fishing, just

to name a few. Interpreters at Channel Islands cannot save the world, or even the coastal Pacific, in the thirty minutes we spend with park visitors at an underwater interpretive program, any more than the diver operating the underwater video camera should attempt to find and identify all thousand species which live in the kelp forest. But we do use that time together with our visitors to reveal the tremendous diversity, productivity, and unusual appeal of the kelp forest plants and animals most of us seldom get a chance to encounter.

The underwater video program offers special opportunity to impart a sense of exploration and adventure in a relatively unknown environment and to provoke all of us to think about the connections between the algin in our ice cream and a forest of giant kelp, the shark in our fast-food fish and chips and the docile twelve-inch horn shark in the camera's view finder, or the gourmet shellfish on our plate and the kelp-eating abalone on the TV screen. Many California residents at the underwater video program discover for the first time that fish like moray eels and the brilliant orange, almost tropical looking, Garibaldi live not in some far off "other place" but right in their own backyard, on a rocky reef in the landing cove at their feet. If one of the goals of the integration of resource management and interpretation is to motivate people to address critical issues like habitat preservation, the maintenance of intact functioning ecosystems and the impact of individual daily decisions on endangered plants and animals, we must first give them the tools to understand those processes and a reason to care. The underwater video program provides opportunity directly to experience and learn about a new place. One that is otherwise beyond reach for most of our clientele.

Interpreters adapt one of four themes developed for use in the Underwater Video Program:

1 Compare and Contrast a Kelp Forest Community with a Terrestrial Forest

Development of this theme helps visitors understand the unfamiliar by making comparisons with the familiar. How are the organisms and processes of a kelp forest "different from" and "the same as" a terrestrial forest community?

2 Adaptations to Life Underwater

Development of this theme includes the technology of SCUBA and surface air supplied diving, as well as life history of the various marine organisms.

3 The Value of Marine Resources

This theme addresses economic uses, recreational opportunities, aesthetic values, and the important lessons derived from monitoring the ecological health of a kelp forest community.

4 Diversity of Life in a Kelp Forest

This theme defines diversity as both variety and abundance of life forms. It explores the reasons for the diversity of an intact yet dynamic kelp forest community like nutrient cycling and upwelling, water temperature, and the fact that the Anacapa Landing Cove is an ecological reserve, one of only four marine areas in California completely protected from harvest and collecting.

The benefits of using underwater video and surface-to-diver two-way communication as interpretive media in this setting have been tested and proven at Channel Islands over the last three years. The program requires equipment, facilities, and staff training which cost approximately \$20,000 per annum. Since its inception the program has been funded by corporate donations to our support group, Friends of Channel Island National Park. Protection, Maintenance, Research, Resource Management, and Interpretation together schedule the three certified divers and program coordinator needed for each program throughout the summer and fall. The small Interpretive and Resource Management staffs could not deliver this program on a regular basis without the support of all facets of park operations.

The best way to describe the results of this cooperation is to define a new symbiotic relationship between interpretation and resource management--a mutually beneficial one. The degree of public interest in the innovative techniques of underwater video interpretation has resulted in opportunities to showcase park resources and resource management techniques to visiting public figures. Additional donations to the park have been another positive outcome, including one for \$5,000 in FY 1987, which funded replacement of SCUBA tanks and regulators used by the entire park dive team. Our cooperating association, Southwest Parks and Monuments Association granted \$2,500 to aid kelp forest researchers in developing a species inventory. The underwater video camera has been used to survey submerged cultural resources like the shipwreck of *Winfield Scott*, a paddle-wheel steamer which ran aground in the Channel Islands during the heyday of the California gold rush. The surface-air-supplied dive helmets are used by maintenance staff in dock building and repair, and regional dive team training held at Channel Islands this May featured underwater video and surface-air-supplied diving, not possible without this pool of equipment.

But perhaps the most personally rewarding benefit is in-house. Interpreters, boat operators, protection rangers, maintenance staff, resource managers, and park scientists have weekly opportunities to work together as a team. The mutual benefits from that kind of regular cooperation are difficult to quantify. If park visitors learn and enjoy only half as much as we, the underwater video program will have met all its goals.

The Southern Bald Eagle Restoration Project

L. Gail Bishop
Mississippi District
Interpreter
Gulf Islands National
Seashore

*Interpretation--an educational activity reveals meaning
. . . by firsthand experience.*

Freeman Tilden

Research

For the past three winters, a lonely wilderness island in the northern Gulf of Mexico has witnessed again the beauty and the strength of Southern Bald Eagles. After forty years of absence the presence of these birds is the result of a restoration project on Horn Island, one of four Mississippi barrier islands administered by Gulf Islands National Seashore. The Southern Bald Eagle Restoration Project is a joint effort by private and public agencies to reconnect the relict eagle populations in Florida and Louisiana and to restore populations to approximately forty percent of their estimated historic size.

The Southern Bald Eagle population has declined by one-third over the past century as a result of deliberate human persecution, pesticide's contamination of natural food sources, and loss of habitat. Although the populations have been increasing slightly since the banning of the insecticide DDT in the early 1970s, our endangered national symbol is still the victim of needless shootings and of habitat encroachment.

The restoration project is based on the ancient falconry technique known as hacking. The method relies on philopatry: the instinctive tendency for birds of prey to return to the vicinity of their birth when they are ready to breed at several years of age.

Dr Steve Sherrod, Director of the Sutton Avian Research Center, devised a unique experiment in an attempt to find a source of eagles for reintroduction throughout the Southeast. Most birds of prey are able to produce a second clutch of eggs if their first clutch is destroyed. By taking eggs shortly after they are laid in Florida eagle nests, researchers found that they could obtain a source of birds for restocking without harming the Florida eagle population. Once collected, the eggs are transported to the Sutton Center in Oklahoma where the eaglets are hatched and raised to eight weeks of age under laboratory conditions.

At approximately eight weeks the eaglets are relocated to hack sites throughout the southeast, including Horn Island. Hacking sites are located in suitable protected habitat where there is evidence of historic nesting, and where there is the greatest potential to reconnect relict populations.¹

Interpretation

At the Horn Island hack site, the nearly grown birds are placed on artificial nests in cages constructed atop a 25 foot tower. The tower is designed in such a way that the eagles have no direct contact with the person feeding them. Unnoticed by the eagles, volunteers and park employees drop between two and three pounds of fresh fish through a plastic pipe into the cages each day. Prior to their release at ten weeks of age, each eagle is fitted with a lightweight transmitter which allows monitoring of the birds for six months.

According to Dr Ted Simons, Research Biologist at Gulf Islands when the young eagles are properly released, they return to the tower within 72 hours to feed, and will continue to do so for up to three weeks as they sharpen their hunting and flying skills. "This gradual transition to independence is probably crucial to their survival, especially in light of recent evidence that most fledglings embark on a long nonstop northward migration when they are about six months old. Hacked birds are not expected to establish breeding territories until they are four to six years old."

In 1986 and 1987, the released Horn Island eagles remained on the island and returned to the tower to feed from March until the end of May, when they left on migration. Until this winter none of the released eagles had returned to the island. However, on the morning of March 29, 1988, number 25, one of the four birds released in 1987, returned to the island and demonstrated that the project was working as expected.

Interpretation

At the beginning of the project, interpretation was intentionally limited. Cautious project participants expressed concern that announcing the location of the hacking site could draw visitors who could easily disturb the eaglets. Consequently, information was limited to a local television news story and to a small tent card, "Bald Eagles Return to the Gulf Coast," which was distributed by the Seashore. This card was smaller than a site brochure and designed to be displayed on counter-tops at visitor contact stations, welcome centers, and chambers of commerce. Naturally, location of the tower was not disclosed.

After the successful first release of four eagles in 1986, project publicity increased. Dr Simons presented the first public slide program in the Mississippi District Visitor Center on the Bald Eagle Restoration Project during a series of summer programs, "Evenings-in-the-Park." Concurrently, the Mississippi Interpretive staff (composed of six new seasonal and two new permanent employees) made an effort to learn the life history of Southern Bald Eagles by reading, listening to researchers describe their work, and watching slides taken of the project. The research was stimulating for

the interpreters, but their excitement paled in comparison to the enthusiasm the researchers and volunteers demonstrated when discussing the hacking project.

Later that year the Interpretive Division chose the topic, "Endangered Species," as the focus of the Mississippi District's Holiday Open House. Here, classes of students from neighborhood elementary schools designed, constructed, and provided tree ornaments in the shapes of coastal endangered species, including the Southern Bald Eagle. In addition, a site bulletin, "Endangered Species," was written as an open house handout.

The interpreters, however, had no heart-stirring eagle stories to share with the public during the open house. They could only retell stories they overheard; they were simply repeaters of hearsay. But in 1987, many of the interpreters at Gulf Islands took Freeman Tilden's advice and volunteered for a "firsthand experience" with the eagle restoration project. Six interpreters worked split shifts for eight days at Horn Island. They recorded behavior observed at the hack site, set gill nets, fed and cared for the young eagles, and collected data as part of the post-fledgling telemetry study.

Not only did the researchers benefit by the interpreters' participation in the project, but also by that of the law enforcement division which covered Horn Island during periods of personnel shortage. However, the interpreters felt they gained the most from the experience. They recognized that they were privileged to have the opportunity to keep vigil on our living national symbol. Observers watched clumsy, dependent, down-covered eaglets emerge into powerful flyers, capable of migrating thousands of miles at only six months of age.

Those who cared for the eaglets before they were released observed not only an incredible growth in a short period of time, but development of personalities as well. During four hours of daily observation every aspect of the birds' movements was noted, including the amount of fish eaten by each bird, their responses to noises, and their reactions to the presence of other birds, especially ospreys. Signs of aggression and nesting activities were also noted.

Once the eaglets were fitted with radio transmitters and released, the post-fledgling observations began. Other interpreters tracked the early flights of eaglets from the tower to nearby trees or to vacant osprey nests. Eventually, because of longer flights, interpreters were required to travel greater distances to track the eagles with radio telemetry.

Before the eaglets left on their first northward migration at the end of May, the interpreters had returned to their duty stations. They demonstrated confidence in

Interpretation

talking about the project, a new knowledge resulting from personal observations, a renewed concern for Bald Eagles, and a feeling of being part of the project. In addition, the interpreters were inspired to inform park visitors about the project and to convey optimism that Southern Bald Eagles will nest again on the barrier islands of the Gulf Coast.

Interpreters incorporated information about the hacking project in off-site programs, beach walks, and on boat tours of the salt marsh. To educate the Florida District visitors, the interpretive division developed a twenty-minute interpretive program, "The Eagles' Return," which was given weekly during the summer months in the Sandbox, a visitor contact station at the Fort Pickens Area. In addition, interpretive materials, including bald eagle posters, bald eagle post cards, and children's books, "Endangered Species," and "Eagles" were sold at Eastern National Park and Monument Association outlets in both districts.

New programs are planned for the 1988 season. This spring the Mississippi interpreters will produce a program, "The Return of the Southern Bald Eagle," which will be aired on a local cable television channel. During the third summer season of Evenings-in-the-Park interpreters will present an updated program on the "Horn Island Eagles."

Conclusion

Each year additional park employees have joined the Horn Island Hacking Project. Not only have interpreters realized the value of firsthand experience but maintenance workers, fee collectors, and law enforcement rangers have as well. The Southern Bald Eagle Restoration Project, then, represents not only a combined effort of private, state, and federal agencies, but a combined effort of all divisions at Gulf Islands National Seashore to work for the return of Bald Eagles on the Mississippi Gulf Coast.

¹T R Simons, S K Sherrod, M W Collopy, and M A Jenkins, "Island Eyries," *Scientific American*, May 1988.

About This Issue

Interpretation is a combined effort of the Washington Division of Interpretation and the Regional Chiefs of Interpretation. The publication is edited and designed by the staff of Harpers Ferry Center:
General Editor: Julia Holmaas
Technical Editor: J Scott Harmon
Designer: Phillip Musselwhite

Contributing Editors

Richard Cunningham, Regional Chief of Interpretation,
Western Region

Summer 1988

William Springer, Regional Chief of Interpretation,
Southeast Region

Editors' Note

In order to make *Interpretation* more truly a forum for the exchange of ideas among interpreters, we plan, in future issues, to include a selection of responses to articles and other letters to the editor. Please submit all letters to:

Editor *Interpretation*,
% Washington Office, Division of Interpretation,
Box 37127
Washington, DC 20013-7127.