

TRANSLATING RESEARCH INTO EDUCATION

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ABSTRACT

Threats to preservation of natural and cultural resources are most often caused by human impacts. To elicit changes in human behavior that will help lead to resource preservation, the public must be aware of how their actions affect these resources. The public often does not recognize the value of, and support the need for, natural and cultural resource research and resources management. How do scientists communicate their research results to the public? How do managers gain public understanding and support of research activities? At Channel Islands National Park, a project was initiated to translate research methods and results into materials that can be used effectively by public educators and park interpreters. Challenges were identified that often prevent timely transfer of information from researchers to educators. Teachers have been an integral part in testing a variety of educational tools, which include videos, hands-on experiments, data sets, teacher workshops, and teacher manuals.

Keywords: Channel Islands National Park, education, interpretation, research communication.

INTRODUCTION

All the research in the world will not save species from extinction. Scientific studies do not preserve the Channel Islands' natural habitats or cultural history. Wise resource management strategies do not secure viable marine and island ecosystems. The sources of the majority of, if not all, critical threats to natural and cultural resources of the Channel Islands, as well as other preserved areas of our planet, are the actions, behaviors and attitudes of humans. And it is only from the altered actions and knowledgeable behaviors and commitments of humans that these areas and species are protected. If we are serious about preserving our natural world and cultural heritage, we must include the public, for therein is the political, ethical, moral, and monetary power to accomplish preservation.

The need for communicating to the public the importance of intact natural systems is recognized by many researchers and scientists. However, the mechanisms of transference of knowledge and research results are often haphazard and ineffective, if attempted at all. This morning I will address efforts at Channel Islands National Park (CHIS) to

convey to the public some of the park's current research and resources management.

Channel Islands National Park is one of the four initial Inventory and Monitoring (I & M) parks within the National Park System. The I & M program is a systematic method of ascertaining what the resources of a park are, and establishing a consistent monitoring program that will track the status of particular resources. As a result of the increased I & M field work, there has been an increase in information about the park's resources that could be used in education and interpretation, but it had not been getting into the interpreters' and teachers' hands in a workable format. Within the National Park Service (NPS), the interpretive staff is the link between the park resources and management, and the public. Through educational and interpretive public presentations, visitors and the public gain an appreciation for the park's resources and management policies. The interpretive staff proposed a project titled, "Translating Research into Education," which would benefit a broad-spectrum of park users, including school classes that use the park as a classroom, school classes in the community that do not visit the park, university students, field-seminar participants, informal classes, such as elder hostel, local teachers, and the general park visitor. Beneficiaries also are park managers, as education of park users leads to preservation of park resources. Park managers and scientists would benefit by gaining a constituency which would support their work.

MATERIALS AND METHODS

The first step was to bring in an outside consultant to provide an objective analysis of what may be hindering transferring information and suggest ways to remedy these problems. An intern, Brooke Barrett, from the Harvard Graduate School, was hired to spend the summer of 1994 at CHIS to begin setting the framework for collaboration among Resources Management, Research, and Interpretation at the park, and the local education community. The result of his work is outlined in the report: "Resource Conservation Through Public Enlightenment; Translating Research into Interpretation (Barrett 1994)."

Barrett formed a pilot team at CHIS composed of representatives from Interpretation, Resources Management, Protection, Research, the park superintendent, and a

science teacher on leave from the Ventura School system. The team utilized brainstorming techniques in a series of meetings to:

- list barriers and opportunities for implementing educational services based on the I & M information;
- categorize resource management needs and interpretive themes based on educational products and materials that could be completed immediately, those that required coordination, supplies, money, additional staff, and those that needed regional or national effort.

In addition to the team management process, Barrett spent time with the researchers and Resources Management staff in the field to observe projects and in the office to determine availability of reports and data for education use.

Building on Barrett's work, a proposal was submitted in 1995 to the National Park Foundation's Parks As Classrooms project to fund at CHIS a three-year prototype of an extensive effort to provide education material based on research, titled "Translating Research Into Education." Upon receiving that grant, a contractor was hired. The contractor, Dr. Miriam Polne-Fuller is a former high school science teacher with a Ph.D. in Marine Biology, who is teaching and conducting research in Marine Science at the University of California, Santa Barbara. Dr. Polne-Fuller produced educational materials from the research, inventorying, and monitoring data from the park. She has produced education materials and teacher workshops on six resource management and research projects: kelp forest research, sea birds, intertidal ecosystem, pygmy mammoth, beach debris, and vegetation restoration.

In 1997, a cooperative partnership was established with two educators from the Los Angeles Unified School District to produce a series of short science videos, about NPS research and resources management, to serve as mini-lessons to involve both the teacher and the students in the process of: observation, investigation, language development, comparing, organizing, experimentation, inferring, and application of knowledge. The purpose of this project is to acquaint the students with field science and research at the park, and to inspire students to become appreciative of science and of the park resources. Information and lesson plans will accompany each video. The teachers doing this collaborative project are Nettie Pena and Michael Blount, both elementary school teachers. Ms. Pena is also a professional film-maker and videographer.

Educators both inside and outside of NPS agree that a hands-on, interactive approach to learning about natural and cultural science is the most effective method of instruction. Educators may capitalize on the methods that are used in the park's research to "hook" school kids on realizing that science and learning are fun. Parks can provide what the schools cannot because the parks are literally the real thing. A requirement for all the materials produced in this project

is that they be fully integrated into the local school system's curricula.

RESULTS

Barrett's report outlined the background of the problem, described opportunities for improvements in information sharing, discussed evaluation techniques, proposed themes from ecosystem management to use in translation of resource management projects, presented the results from a pilot team, and included references and related readings.

One point that he brought out in the report dealt with the need to have a focused effort to support interpretation needs for translating research into education, listing four reasons:

1. Researchers, biologists, and sociologists are trained to write for different audiences than the public.
2. Issues that are the concern of researchers may not be the only interest of the public; it is the interpreters' role to make the research relative to the public.
3. Data and information are scattered among different sources in a variety of formats.
4. There is a long lag-time between collection of data and its appearance in a peer-reviewed public forum. Lag time ranges between 1.5 years and twelve years, Brooke found it averaging about three years at CHIS.

In the report's discussion of the process, Barrett points out that it is essential to have stakeholders present in the planning stages for communicating research data. He is referring to both NPS interpreters and to the representatives from the public school system. He gives good examples of assumptions that are made on the part of scientists as to what is information useable to educators and communicators, but it is information that the educators actually do not need, do not want, and cannot use. He found as things existed then, it was very difficult to obtain information and data useful to education and interpretation.

Some suggestions from his report for general increased communication and understanding between researchers and educators include:

- interpreters spend work time with Resources Management and Research staffs as they conduct field work and analysis to familiarize themselves with projects, methods, and results;
- Resources Management and Research staff spend work time with interpretive staff as they prepare, present, and evaluate public education programs to familiarize themselves with interpretive

techniques, presentation styles, research needs, etc.;

- Resources Management and Research staff share draft reports and field schedules with interpreters and other park staff through available communication systems, e.g., the Local Area Network for the park;
- Establish a schedule of bi-monthly meetings for exchange of information about resources and education/interpretation techniques; and
- Conduct bi-annual strategic planning sessions to provide a menu of interpretive topics based on the Hot Topics in Resources Management and Research.

Dr. Polne-Fuller's work has produced several teaching tools, each of which may be used separately, but the highest value is in their combined use by in-classroom teachers and interpreters. These products, which are directly linked to the state-required curriculum, include:

- Two teacher manuals composed of five lessons on six different resources management projects. The five lessons are designed to take educators from beginning concepts to more advanced concepts, based on grade level requirements. The students participate in interactive activities throughout the lessons and are required to create analysis of data and compare analyses with those of the scientists.
- Teachers Kits which correspond with each of the six different resources management projects above. The kits contain the tools used by scientists in the field. Students use the tools to collect data from their school and neighborhood environments and become familiar with what scientists use to conduct their work.
- Videos on each of the topics, filmed at the park with the scientists and students interacting. The videos are 10 to 15 minutes in length, show the professional scientists and resources management personnel conducting their work, demonstrate the environment of the park and give the students a sense of where all this research is taking place.

The teacher manuals, teacher kits, and videos have been used by teachers and evaluated by them. Improvements have been implemented based on recommendations of these teachers. Several teacher workshops have taken place to introduce local teachers to these teaching materials and to encourage their participation in using the national park in their own backyard as a teaching resource.

Ms. Pena and Mr. Blount focused their first video on the resource management and inventory, and monitoring of

the western gull on Anacapa Island. The video is being edited currently and the educational materials are being prepared with a target completion date of this first product of summer 1999.

The methods of presentation of all of the above educational materials is to not load students with a list of facts and numbers, but to involve the students in interactive learning, teaching through methods of getting students to question and think for themselves, using the research that is being professionally carried out in their own backyard national park.

DISCUSSION

The primary cause of the lack of the effective use of research results in education efforts is that there is no established method of bridging the gap between the two disciplines. Only through concerted efforts between research and education will this gap be bridged. At CHIS, efforts have been initiated but there is no mechanism to continue these on a regular basis without dedication of personnel and funds to positions whose primary responsibility is to accomplish this task. The work of Barrett, Polne-Fuller, and Pena and Blount have set the groundwork at the park and produced tangible products for educators' use. Other national parks will benefit by using their work as examples. The education products produced by Polne-Fuller will be used by a variety of teachers throughout Santa Barbara and Ventura counties, and those produced by Pena and Blount will be used by teachers in Los Angeles County.

The goal in translating research into education is that the public gains a better understanding and appreciation of resources management, research, and resource threats as a result of the newest information and methods being communicated effectively to them.

The end product of all of the NPS' interpretation and education is to protect the park's resources through human action or behavioral change. But behavioral scientists state that you do not convince people through their heads to take actions or change behavior. But rather, you convince them through their hearts. To stimulate the nurturing nature of humans, we educators must combine logic and feelings.

So, how do we interpreters touch a person's heart as well as a person's mind? Not through using the words or terms such as serial species depletion, alien species, integrated pest management, or biological diversity. Not through concepts such as ecosystem management, inventory and monitoring, or global change. Not through the disciplines of interpretation, resources management, and research. Those terms, concepts, and disciplines all engage the public's mind and are essential in our interpretive programs and education, and visitors will be interested and learn, but they will forget those facts, those terms, those concepts five minutes after walking out the door if there is no connection that makes people want to care. What is needed is a connection that makes them care enough to stop throwing plastic trash into the ocean, or to understand why it is important to not bring

alien plant species to the islands, or to be politically astute to environmental issues.

We touch someone's heart through:

1. personal experience that fills the senses of sight, sound, touch, smell, taste, and imagination,
2. and then revealing, through your research facts, that what a student or a visitor holds dear in life cannot survive as it is now without their taking responsibility for caring for it.

There needs to be reciprocal respect, trust, and understanding among the disciplines of Resources Management, Research, and Education. The precious natural and cultural

resources of our parks are slipping away from us. Research alone cannot save them. Education and interpretation alone cannot do it. The work of preserving our precious, disappearing, resources and parks needs us both.

SOURCES OF UNPUBLISHED MATERIALS

Barrett, B.J. 1994. Resource Conservation Through Public Enlightenment: Translating Research into Interpretation. Prepared for the National Park Service; John F. Kennedy School of Government; September, 1994.