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1 Putting Environmental 2 Interpretation to Work for 3 Conservation in a Park Setting: 4 Conceptualizing Principal 5 Conservation Strategies

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8 Environmental interpretation has its roots in conservation. Today most interpreters
9 recognize its importance in conserving natural and cultural resources. Nonetheless the
10 field has invested little in contemplating how interpretation can be a mechanism for
11 conservation. Meanwhile in the biological conservation field, the Conservation Mea-
12 sures Partnership has been designing guidelines for the development and management
13 of effective conservation programs. A principal step in designing interpretation-based
14 conservation programs is to conceptualize relationships of conservation strategies us-
15 ing interpretation. This article presents four major strategies and recommends ways in
16 which the interpretation field can continue to improve interpretation's effectiveness as
17 a conservation strategy.

18 *Key Words:* interpretation, conservation, Conservation Measures Partnership, preser-
19 vation, stewardship, concept model, environmental education

20 When the field of heritage interpretation developed in the first half of the twen-
21 tieth century, its principal objective was to reveal meanings about natural and
22 cultural heritage. Its principal advocate, Freeman Tilden, defined interpreta-
23 tion in his seminal book, *Interpreting our Heritage* (1957, 8), as "an educational
24 activity which aims to reveal meanings and relationships through the use of

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Table 1: Alternate definitions of interpretation

Definition	Source
The communication process which aims at helping people to discover the significance of things, places, people and events... helping people change the way they perceive themselves and their world through a greater understanding of the world and themselves.	Colonial Williamsburg, USA (MacFarlane, 1994)
Heritage interpretation is a means of communicating ideas and feelings which help people understand more about themselves and their environment.	Interpretation Australia Association (2003)
Interpretation is a communication process that forges emotional and intellectual connections between the interests of the audience and the inherent meanings in the resource.	National Association for Interpretation (2004)

original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information.” Since then alternative definitions have emerged (Table 1) all sharing in common a communication process that helps people connect emotionally and intellectually with resources, whether natural, cultural, or historical. Ham (1992) later popularized the term “environmental interpretation” for interpretation put to explicit environmental and conservation purposes.

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Even before Tilden, site managers have deployed interpreters in protected areas in the United States to advocate for the sites’ protection and generate enthusiasm and appreciation for the natural and cultural marvels of the country. Enos Mills, often cited as the founder of interpretation, coined the term and invented the profession of nature guiding. His interpretive writings and philosophy make one of his many books, *Adventures of a Nature Guide* (1990), a classic in the field.

Mentored by John Muir, Mills successfully lobbied for the creation of Rocky Mountain National Park. When Tilden wrote his book, however, he exalted the importance of conservation but dedicated almost no time to discussing interpretation’s connection with conservation. Tilden wrote,

Not the least of the fruits of adequate interpretation is the certainty that it leads directly toward the very 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. (p. 37).

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But since the 1950s environmental problems have worsened at an exponential pace (Brown, 2003). Now, the cry for conservation reaches all those who would listen and has been heard at interpretation’s door. The call for interpretation has increasingly appeared in literature related to conservation such as ecotourism (Brandon, 1996; McArthur, 1998), park management (Eagles et al.,

52 2002), and environmental communication (Jacobson, 1998; Ham & Krumpe,
53 1995; Ham et al., 1993). **Q3**

54 Even though the U.S. National Park Service clearly expresses that the pur-
55 pose of interpretation is preservation and stewardship. (“The goal of all inter-
56 prepretive services is to increase each visitor’s enjoyment and understanding of
57 the parks, and to allow visitors to care about the parks on their own terms,”
58 NPS, 2004), it has done little to define operationally how interpretation can be **Q4**
59 designed into conservation programs. For example, the Interpretation Develop-
60 ment Program (IDP) of the National Park Service aims to improve the quality
61 of interpretive services throughout the system and beyond. It has developed
62 authoritative and high-quality training modules. Park interpreters and man-
63 agers who use the modules to create interpretive products can then submit
64 those products to an objective peer review system.

65 Module 101 introduces the system and the theory of interpretation accord-
66 ing to the Park Service. By its own estimation, IDP “creates the opportunity for
67 audiences to ascribe meanings to resources, leading to concern for the protec-
68 tion of the resource. This revelation is the seed of resource stewardship. This is
69 the goal of interpretation, not simply information or facts” (NPS, 2004b, p. 2).

70 In terms of specific conservation outcomes, Module 101 simply states that
71 it “empowers the public to influence policy to fulfill the National Park Service
72 mission” (p. 3). Since the function of IDP is to develop interpretation skills,
73 it is hardly surprising that it does not go into detail about how to use inter-
74 pretation as a conservation strategy to generate measurable outcomes in the
75 field.

76 That the most interpretation-minded government agency does not offer
77 guidelines for integrating interpretation into conservation projects is indicative,
78 perhaps, of the attention given by the field in general in the United States. Also
79 consider evidence on the frequency with which conservation appears in the
80 interpretation literature.

81 1. The annual National Interpreters Workshop (NIW) publishes proceedings,
82 the *Interpretive Sourcebook*, which lists all the concurrent sessions offered
83 that year. For the past three years, there have been only 12 (4%) sessions
84 related to conservation of 275 concurrent sessions (two of which were pre-
85 sented by this author) (Table 2). To qualify as a direct relation, a session must
86 explicitly talk about either the connection between interpretation and con-
87 servation (or alternately “preservation” or “stewardship”), or conservation
88 impacts as a result of environmental communication strategies (including
89 environmental education). Articles were consulted to determine the connec-
90 tion. Although the National Association for Interpretation (NAI) organizes
91 the conferences, these numbers indicate what people are submitting, rather
92 than what NAI itself promotes or does not promote.

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Table 2: Prevalence of conservation-related concurrent sessions at national interpreter’s workshop

Year	Total concurrent sessions listed	Concurrent sessions related to conservation	Topics
2003	100	3	Two in environmental education section (fire education, Leopold’s land ethic) and one connection of interpretation and conservation by current author
2002	71	3	One NPS outreach communications strategy, one environmental education program for biodiversity, one on green buildings at a zoo
2001	104	6	One on overcoming multi billion dollar backlog at NPS, one on interpretive planning internationally, one on service learning in Central America, one on volunteer park stewards, one on ecotourism in Maya Forest, one on using interpretation in Mesoamerican protected areas by current author
Total	275	12(4%)	

2. *The Journal for Interpretation Research* published a special issue bibliography of interpretive resources (2003). It surveyed all articles from NIW proceedings, the *Journal* itself, *Legacy* (the trade publication of NAI), *Journal of Environmental Education*, and a host of other articles, books, documents, theses, and dissertations. I conducted a title keyword search for the following words: conservation, preservation, stewardship, steward, protection, restoration (of habitat), ecosystem management, preserving, protecting, conserving, and restoring. I calculated the total number of references by taking an average number of references for 15 full pages (17.9 references/page, range 16–22) and multiplied by the full number of page equivalents of references (subtracting fractional white space), or 133.3 pages. Thus there were 2,390 references. Of those 32 (1.3%) contained one of the key words. Only two of those were found in peer-reviewed journals, the *Journal of Interpretive Research* and the *Journal of Environmental Management*. 93
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3. NAI offers its certification library package indicative of the most relevant texts in interpretation. Of the six books plus the introductory book on 107
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109 interpretation published by NAI's in-house press, none has a chapter ded-
 110 icated to conservation, preservation, or stewardship. The books include *In-*
 111 *terpreting Our Heritage* (Tilden, 1957), *Environmental Interpretation* (Ham,
 112 1992), *Interpretation of Cultural and Natural Resources* (Knudson, Cable,
 113 & Beck, 2003), *Sharing Nature with Children* (Cornell, 1998), *Interpreta-*
 114 *tion for the 21st Century* (Beck & Cable, 1998), *Interpreting for Park Visi-*
 115 *tors* (Lewis, 1995), and *Personal Interpretation: Connecting Your Audience to*
 116 *Heritage Resources* (Brochu & Merriman, 2002). This list is not intended to
 117 argue that any one book should have a chapter on conservation or any other
 118 goal of interpretation, rather to demonstrate the difficulty in finding more
 119 than cursory discussion about interpretation's role in conserving natural
 120 and cultural resources.

121 **IMPROVING THE PRACTICE OF CONSERVATION PROJECT DESIGN**

122 The lack of attention to conservation does not mean that conservation is not hap-
 123 pening in an interpretation context. Some efforts are well documented, such as
 124 that by Widener and Roggenbuck (2000) who demonstrate that signs, presence **Q5**
 125 of uniformed personnel, and a signed pledge can significantly reduce visitors'
 126 extraction of petrified wood in Petrified Wood National Park. There are very
 127 few such studies that demonstrate the conservation outcomes of interpretation-
 128 based strategies.

129 Over the past few decades, a trend in managing complex systems has
 130 emerged in different fields. These fields have a convergent interest in tak-
 131 ing action in risky, uncertain, and "messy" situations (a term used by Schön,
 132 1983, and Lachapelle et al., 2003, characterizing the complex reality in which
 133 managers work) (Salafsky et al., 2001). Examples include adaptive manage-
 134 ment of ecosystems (Lee, 1993; Gunderson et al., 1995), reflective practice
 135 (Schön, 1983), the theory of learning organizations (Senge, 1994), park manage-
 136 ment (Burch, 1998), and communication theory (Hough & Day, 2000; Meadows, **Q6**
 137 1991).

138 In order for interpretation to launch itself to the cutting edge of conser-
 139 vation, the field should consider adopting project management standards that
 140 help navigate project design and management in environments characterized
 141 by many stakeholders, social factors, conflictive viewpoints, and increasingly
 142 complex environmental and social problems. One set of standards is being de-
 143 veloped by the Conservation Measures Partnership (CMP, 2004).

144 CMP is a group of conservation organizations that have united to estab-
 145 lish conservation-wide standards for adaptive management, monitoring and
 146 evaluation, and auditing of conservation projects. The idea was first cast in
 147 Salafsky et al. (2002) based in part on the effectiveness revolution that public
 148 health (Pullin & Knight, 2001) went through to convert medical practice from

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one based on intuition and anecdotal learning to one where systematic learning, dissemination, standards, and industry-wide norms increasingly generate measurable results that feed back into an adaptive management learning cycle to improve results.

CMP completed in 2004 its *Open Standards for the Practice of Conservation* to define an idealized adaptive management process. This conceptual framework can be applied to all kinds of conservation projects, including interpretation. CMP organized the main components of these standards—principles, tasks, and guidance—into seven steps that mirror the basic project cycle management:

1. Conceptualize what you will achieve in the context of where you are working.
2. Plan both your actions and monitoring and evaluation.
3. Implement both your actions and monitoring and evaluation.
4. Analyze your data to evaluate the effectiveness of your activities.
5. Use your results to adapt your project to maximize impact.
6. Communicate your results to key external and internal audiences.
7. Iterate—go through the project cycle continuously to constantly improve.

Through the use of these standards, a manager can demonstrate if a project produces results consistent with its claims. Similarly, by using this systematic approach, project managers, such as park managers who want to use interpretation, have a stepwise framework for putting the goals of interpretation into action.

Some questions, then, that interpretive project designers need to answer in order to put interpretation to work for conservation include the following.

- What are the conservation goals and project-specific objectives of interpretation?
- How do we measure their achievement, and which indicators should be used to assess conservation outcomes?
- What are the causal relationships or direct connections linking interpretation with conservation?
- What kinds of synergistic linkages with other tools exist to promote interpretation as a conservation tool?
- How is interpretation made operational in conservation project design?
- What site-based conditions are necessary for the successful application of different strategies of interpretation for conservation?

- 184 • What kinds of opportunities need to exist in order that participants of in-
185 terpretive programs can act on their behavioral intentions?
- 186 • How can interpretive managers ensure continuous learning and improve-
187 ment in their programs?

188 Because conceptualization is the first crucial step in any project design and
189 because several generalized strategies for how interpretation can effect conser-
190 vation can be distilled, this article explores those strategies to illustrate this
191 initial step in the adaptive management cycle.

192 Prior to any project design, practitioners need to make explicit their mental
193 model of how an intervention produces desired outcomes, the cause-and-effect
194 linkages that connect different factors in a system. While every model is wrong
195 (Stermann, 2002), by definition a simplification of reality, even simple models can
196 elucidate key assumptions that practitioners unconsciously maintain as true.
197 By writing them on paper, they can be externally and objectively examined
198 and measured. In other words using a conceptual model creates a common
199 language among practitioners to evaluate assumptions, thus stripping some of
200 the intuition and anecdote often characterized by earlier approaches.

201 There are many different ways to create schematic diagrams; this article
202 adopts one from Margoluis and Salafsky (1998) designed specifically for conser-
203 vation and development projects. It uses several basic words in this common
204 language.

205 • **Target.** This is the object that one is trying to affect, the dependent variable.
206 It can be natural (population of macaws), cultural (protection of Mayan
207 temples), health (prevalence of HIV infection), or others. These are denoted
208 by black boxes in the models that follow.

209 • **Threat.** This is a factor that directly damages or worsens the desired state of
210 the target, such as logging that destroys macaw habitat, trampling visitors
211 that erode temples, or contaminated needles that spread HIV. These are
212 denoted by shaded boxes.

213 • **Factor.** Factors consist of any variable in a system with significant influence
214 over the threats. These are denoted by clear boxes.

215 • **Relationship.** Factors influence other factors through hypothesized rela-
216 tionships. We assume that farmers whose controlled burns escape their con-
217 trol contribute to forest fires which threaten macaw habitat. Arrows repre-
218 sent these relationships.

219 The concept modeling tool proves an effective filter for understanding the
220 contextual conditions and linkages required in order to make a particular strat-
221 egy, such as interpretation, useful, replicable, and measurable in achieving con-
222 servation targets. The following section discusses four principal concept models

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that describe hypothesized conservation roles of interpretation in a park management context. While this list may not be exhaustive, it is a first attempt to conceptualize interpretation as a conservation strategy using the approach championed by the Conservation Measures Partnership.

GENERAL CONSERVATION STRATEGIES INVOLVING INTERPRETATION

Interpretation Strategy 1: Control of Visitor Impacts in a Park

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The use of interpretation to reduce visitor impacts in a park is the most commonly cited conservation application (Barry, 1993; Manfredo, 1992; Oliver et al., 1985; Stadler & Cahill, 1992; Widner & Roggenbuck, 2000). Characteristically the kinds of behavior change are limited in time and space, endeavoring that visitors do not trample plants, leave litter, write graffiti, or other deprecia-tive behaviors specific to a park context. The use of interpretation is designed for short-term protection of park resources and not necessarily changes in people’s long-term behavior. In a park setting, moreover, consciously or unconsciously, managers often use interpretation synergistically with other management tools such as physical barriers, legal sanctions, guards, and other controls on access to resources. Figure 1 outlines the main pathways by which interpretation con-trols impacts in a park setting.

In this model the quality and quantity of interpretation depends on the park’s capacity to deliver interpretation in the park. Interpretation acts through two subpaths to reduce visitor impacts. The central route transpires via the Theory of Planned Behavior (Ajzen, 1991) which says that visitor beliefs (be-liefs about the actions, social norms, and personal capacity to affect resources) influence attitudes which influence intentions to act which influence the pos-sibility that a visitor behaves in a certain way. Interpretation can also affect attitudes without altering beliefs. This is done through approaches such as con-ditioning, cuing, source credibility or attractiveness (especially with reference to park personnel), rewards, and others (see arrow in figure that connects “in-terpretation” with “visitor attitudes” which represents this route). Collectively this second “peripheral route” often results in temporary attitude change. The Elaboration-Likelihood Model describes both the central and peripheral routes to attitude change (Petty & Cacioppo, 1996).

Managers also deliver messages about park sanctions employed to preempt certain visitor behaviors. Sanctions include fines, expulsions, and arrest. These sanctions exist outside the realm of interpretation even though messages which publicize the sanctions can be articulated in an interpretive way, with the intent to dissuade behaviors that would provoke a sanction’s application.

This model clearly indicates three other variables that influence visitor im-pacts: visitor behavior, quantity of visitors, and site conditions. One particular

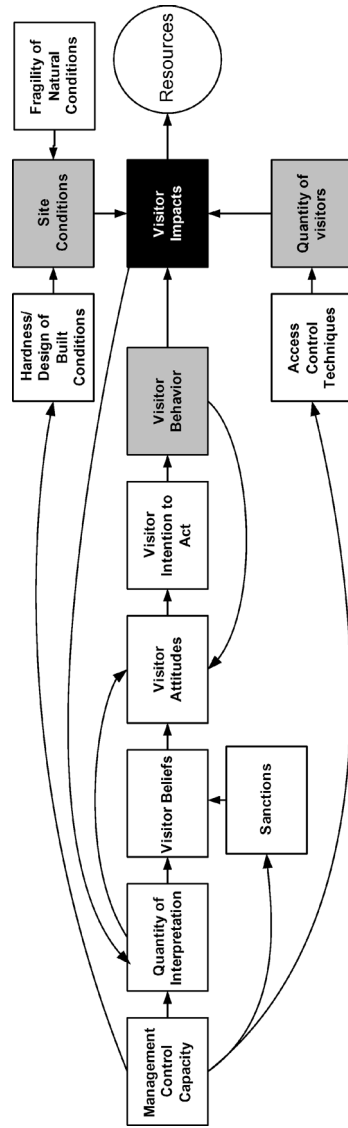


Figure 1: Concept model of relationships linking interpretation with a reduction of visitor impacts in a park setting.

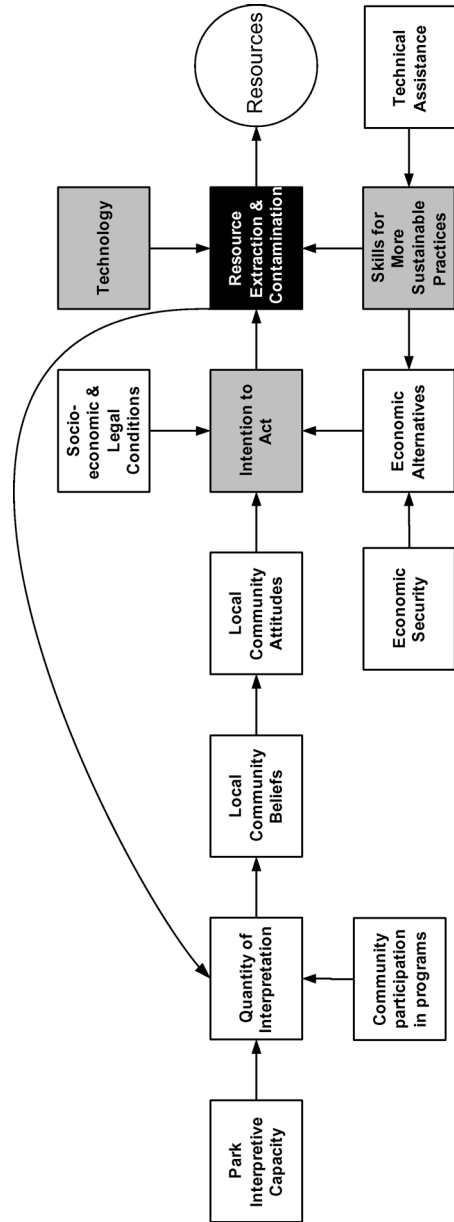


Figure 2: Concept model of relationships linking interpretation with economic and environmental behavior outside of a park.

262 behavior can be differentially damaging in a high-altitude cryptogam commu-
263 nity (i.e., all flowerless and seedless plants that reproduce by means of spores:
264 ferns, mosses, algae, fungi) where one footstep on slow-growing vegetation could
265 take decades to recover, while on a rocky seashore a visitor would be challenged
266 to leave a mark. Even in the cryptogam scenario, the damage depends on the
267 built environment as well. If the visitor strolls along a boardwalk, the damage is
268 far less than if the visitor bushwhacks to the other side. The manager can con-
269 trol a site's "hardness." Hardness refers to the pavement, walkways, barriers,
270 and other infrastructure that can resist significant visitor use, thus protecting
271 the resources. A manager can also control access to a site, reducing both the
272 number and type of visitors in certain locations.

273 Two important feedbacks represented in the model are (a) visitor behavior
274 affects the attitudes of other visitors (graffiti on a wall promotes more graffiti
275 being written, Knopf & Dustin, 1992), and (b) The amount of visitor impacts
276 influences the amount of interpretation (and other strategies) deployed to con-
277 front the problem.

278 The ArchaeoLink Prehistory Park in Scotland uses an interpretive software
279 *ArchaeoQuest* to help visitors reduce their own impacts. Aside from interpret-
280 ing sites in the region, the software also allows visitors to develop their own
281 excursions. It asks potential visitors a series of questions about their intentions
282 such as:

- 283 a. Party size
- 284 b. Level of fitness
- 285 c. Mode of transportation
- 286 d. Time available
- 287 e. And others.

288 The software then analyzes the results and proposes a route. Part of its analysis
289 considers site constraints (maximum party sizes, availability of parking, etc.).
290 This allows site managers to manage visitors and thus reduce impacts through
291 this virtual interpretive interface (Wight, 2002).

292 **Interpretation Strategy 2: Control of Local Impacts Outside** 293 **of a Park**

294 In this model the park brings interpretation to local communities outside
295 or within its boundaries that may be engaged in environmentally damaging
296 behavior whether through extraction or contamination of natural resources.
297 Ham and Krumpke (1995) have proposed this strategy. As with the previous
298 model, the park's interpretive capacity influences the quantity and quality of

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interpretation delivered, in this case, to local communities. Of course, a park cannot simply assume that communities will participate in interpretive programming. Through other means, managers need to develop their receptiveness to participation and create whatever infrastructure necessary to deliver programs to communities that, in many protected areas, can be geographically and culturally removed from interpretive staff.

Again through the Theory of Planned Behavior, interpretation can influence beliefs (of all kinds described in the theory) and attitudes affecting the intention to act and the behavior itself. This is a long journey but one that is fairly well mapped and one that parks have made (see Jacobson, 1999).

Nonetheless, there are several other paths that also lead to the same destination. Changing people's economic behavior and daily routines constitutes a complex social system involving many social variables and structural factors that influence people's behavior, of which only the most obvious are presented in the model (for discussion on different variables see Stem, et al., 2003). The only feedback shown indicates that the amount of interpretation depends in part on the degree of resource extraction and contamination.

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The international conservation group, Rare, combines interpretation and social marketing in its Pride Program to change behaviors of local communities in and around protected areas. For example, Rare works with Tikal National Park in Guatemala to deliver programs to surrounding communities about jaguar conservation. It employs a variety of media such as a costumed jaguar interpreter, songs, and other media "to raise awareness of the effects jaguar poaching has on Tikal's forests and the endangered species that inhabit it" (Rare, 2004). The hope is that this awareness will develop into pride which will result in the communities' peer pressuring the poachers to stop hunting endangered species.

Interpretation Strategy 3: Part of a Larger Environmental Education Program

Many if not all environmental education programs use interpretation techniques to reveal meaning and provoke thinking and curiosity in participants at the same time they execute a curriculum designed to build longer-term bodies of knowledge, skills, and behavior change. Figure 3 illustrates the general concept model for environmental education (based on Tbilisi Declaration, 1977) and shows that interpretation contributes to environmental education programming by promoting positive environmental attitudes and motivation to act. While the overlap between interpretation and environmental education has been discussed for some time (James & Thompsen, 2001; Civitarese et al., 1997; Zuefle, 1997; Knapp, 1997; Ham & Krumpe, 1996), suffice it to say that interpretation can achieve conservation through its involvement in longer-term education programs.

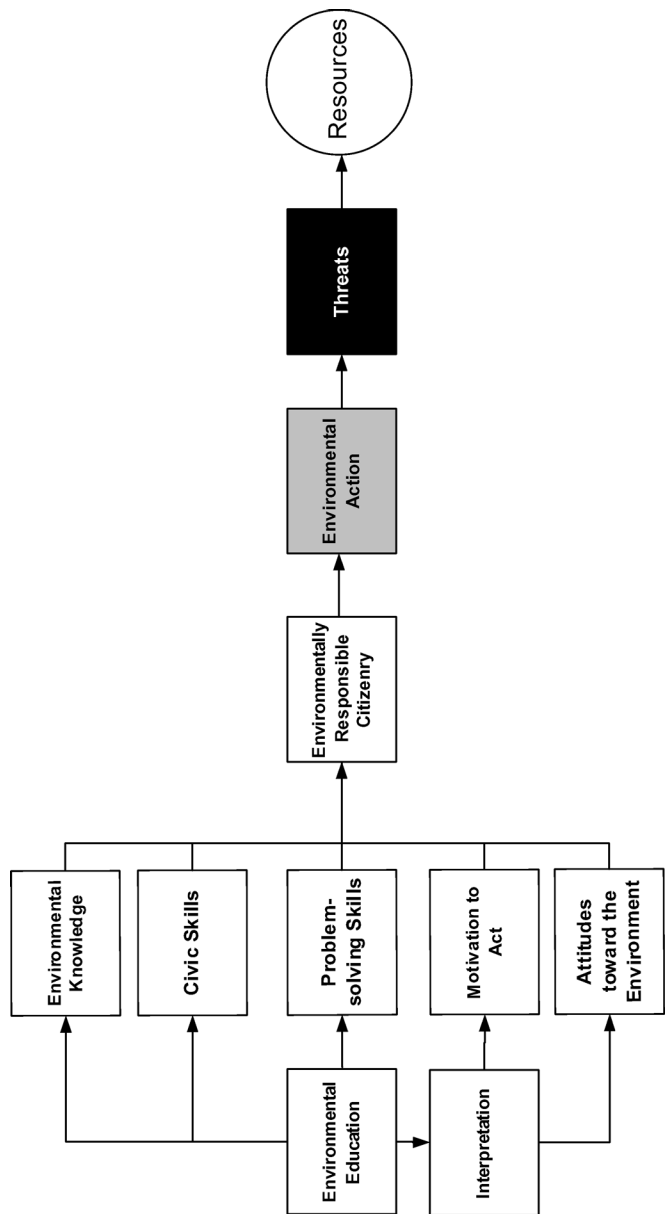


Figure 3: Concept model of relationships linking interpretation with environmental education.

I was involved in the design and execution of an environmental education program based at the National Zoo of Costa Rica. The program, which was based at the zoo, worked with elementary school teachers of the capital city to help students reduce their contribution to the solid waste flow that ended up in the municipal landfill. Within the larger program curriculum, the zoo used a portable exhibition of 17 panels that tells the story of fictional characters that represented different aspects of the solid waste story in Costa Rica. The zoo designed the characters to interpret and promote student appreciation for the solid waste implications of their daily life decisions (Kohl, 2004).

Interpretation Strategy 4: Interpretation in Visitor Fundraising

In Beck and Cable's (1998) presentation of 15 interpretation principles, Principle 12 says that interpretation can generate resources for an interpretation program. Certainly interpretation can generate resources for conservation as well. Because the strategy uses meaning, inspiration, persuasion, belief targeting, and conservation messages, almost all aspects of the approach depend on communication. Little is left to external factors which makes visitor fundraising perhaps interpretation's most direct avenue to conservation. There are a few examples of this strategy already being used (Cullings, 1992; Kohl, 2002; Ham, 2001). See Figure 4.

Visitor fundraising takes three principal forms. (a) visitors are motivated to donate resources, services, or time to a park's conservation activities while they are on-site; (b) visitors purchase souvenirs and other products whose proceeds support conservation activities; and (c) visitors contribute to a park's conservation after they return home. In all cases, their support most often emanates from a quality visitor experience they had on-site or via remote web sites or publications. The park then couples this experience with an opportunity to contribute to conservation and possibly some promotional techniques such as discounts, rewards, and recognition for participating. In any case, the interpretation provides visitors with an experience that motivates them to contribute as well as pass on a positive recommendation to other potential visitors, resulting in greater numbers of contributing visitors.

In many cases visitors may be predisposed to support conservation programs but do not encounter the opportunity to do so. Thus the interpretative program must provide mechanisms to take advantage of that disposition: direct solicitation, donation boxes, membership programs, merchandise, or other techniques. Then, the park needs to ensure that donations actually reach conservation activities that reduce threats. As mentioned above, it is often assumed that by simply donating to a park, it results in conservation; after all, a park administration exists to protect. Yet, this author's own observations indicate that monies can be absorbed, even with the best of intentions, by the administrative apparatus through salaries, construction, maintenance, new equipment, etc., with very few resources measurably financing a conservation project.

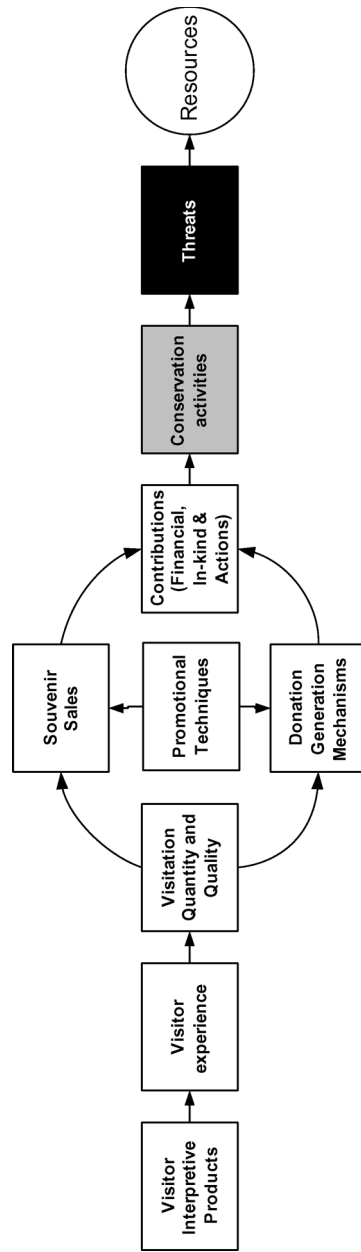


Figure 4: Concept model of the relationships illustrating the link between interpretation and biodiversity conservation through visitor fundraising.

Lindblad Expeditions is an ecotour operator that offers interpretive programs on expedition ships. It, for example, designed an interpretive program based on a study of visitor beliefs for its Galapagos visitors. It developed a series of messages designed to encourage certain beliefs that increased the predisposition of visitors to support the Galapagos (Ham, 2001; Kohl, 2002). Lindblad set up the Galapagos Conservation Fund to receive and distribute donations to specific conservation projects.

NEXT STEPS

To improve its conservation effectiveness, the interpretation field could take steps toward integrating adaptive management in its culture. Conceptualization is only the first step in the process defined by CMP. It is perhaps the most generalized step for the interpretation field and thus elaborated hence. Project managers, nonetheless, would have additional steps in the adaptive management cycle, including an actual site analysis to understand the system on the ground. They would need to formulate goals and objectives, then work and monitoring plans, and a structure for learning, iterating, and improving.

The movement for effectiveness in conservation is still new, so interpreters can hardly be considered as behind. The interpretation field needs more examples in effective project design using interpretation as a principal strategy. There also needs to be learning structures to promote this kind of thinking and interchange experiences. By taking advantage of CMP's efforts, interpreters can ensure that, at least, interpretation's conservation goal will benefit from best practices. Moreover, good project design practices will promote interpretation effectiveness of its other goals as well, including public relations, fundraising, visitor management, lobbying, and others. Gone, in this author's estimation, will be the day when an interpreter's simple hope is that visitor appreciation will lead to the fulfillment of the program's conservation objectives.

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