### Journal of Interpretation Research

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This issue of the Journal is full of a variety of research articles that take us from a hike in a World Heritage Site in Honduras to a ride on an Amtrak train. Articles in this issue also range from dealing with site-specific problems and solutions to more theory-bound discussions regarding Systems-Based Interpretive Planning Models and zoo interpretation. We also have an “In My Opinion” submission guaranteed to promote discourse among practitioners. In addition, there is an “In Short” article that provides a model for increasing overall effectiveness of field training programs. There is much to be garnered from each submission in helping promote and grow the discipline of interpretation.

As we sit on the edge of the 2008 NAI National Workshop in Portland, it is important that we continue to ask questions, to challenge, to try new perspectives, and perhaps obtain a better way, a more resilient answer, or a more robust approach. It is only through the rigorous examination of what works, when and for whom that we can hope to continue the evolution of the discipline. This is the heart of “research.”

I look forward to the future developments of our field through your quality submissions to JIR.

—C
RESEARCH
Abstract
This study examined how differing levels of restoration and development within, and intensifying development adjacent to Copan Archeological Park would affect interpretive potential and the visitor experience at this World Heritage Site in Honduras. Surveys and interviews with visitors revealed that Latin Americans, North Americans, and Europeans all show a preference for a mixture of restored ruins and those being reclaimed by nature. Visitors described how this juxtaposition added to their experience. A majority of visitors indicated a strong preference for maintaining agricultural or forested lands between the park and the town of Copán Ruinas and described how the intensification of development would impact their experience. Implications for park management and interpretive planning are discussed and recommendations given. Protecting the interpretive potential of these settings will require interpreters to inform the protected area and local government planning decisions that will ultimately determine the content and quality of programmatic interpretation.

Keywords
Mayan ruins, setting attributes, visitor preferences, visitor experience, levels of restoration, adjacent land use, interpretive potential, interpretive planning
All was mystery, dark, impenetrable mystery, and every circumstance increased it…. Here an immense forest shrouded the ruins, hiding them from sight, heightening the impression and moral effect, and giving an intensity and almost wildness to the interest.

—John L. Stephens, on the ruins at Copan

*Incidents of travel in Central America, Chiapas and Yucatan*  

**Introduction**

This paper emanates from a three-year case study conducted by the authors at Copan Archaeological Park (CAP), a United Nations Educational, Scientific, and Cultural Organization (UNESCO) World Heritage Site (WHS). The study included focus groups, visitor surveys, interviews, and participant observation during the development of an interpretive trail. Visitors and local residents provided considerable information about what combination of internal and adjacent land setting attributes bestow the richest experiences and facilitate connection to the *genius loci* (spirit of place) of the park (Mayer & Wallace, 2007). Findings are used to identify planning and management actions that could directly affect the setting and subsequently the visitor experience. As part of this, we describe the interpretive potential of the site and how interpreters must move beyond traditional interpretive planning and provide information to unit managers and local governments during site and regional level planning process.

Interpretive potential, as we define it here, is the best possible physical, social, and cultural/historical milieu for transmitting and receiving the emotional and intellectual meanings of a place and is closely tied to the elements of setting. It is the “from which” that programmatic interpretation is derived. Interpreters have traditionally used non-personal media like exhibits, signs, and publications for message delivery, but according to Merriman and Brochu (2005), interpretive planning should also encompass landscape features. They advocate examining the “mechanics” that influence the visitor experience, such as how the site, facilities, and interpretation “work together to create design balance and physical spaces that function as well as look good” (p. 44).

Of particular importance to setting at Copan are decisions about the extent to which ruins are restored and finding strategies for working with the municipality to achieve adjacent land uses that provide a compatible external setting that also has a notable effect on the visitor experience. We propose that interpreters, who often focus on the development of activities, materials, and interpretive messages, must also become more involved in the overall planning and management process if a site’s interpretive potential is to be protected and later realized. What happens during site and regional planning largely determines the extent to which interpreters can later practice their art. We suggest that being able to inform and influence planning decisions so that they yield an optimal mixture of setting attributes is itself a seldom-discussed part of the interpreter’s art. This is especially true for cultural sites where both the “original objects” (Tilden, 1977) and the emotional and intellectual connections to the inherent meaning of the resources (Larsen, 2003; Brochu & Merriman, 2002) are complex and often occur within a limited spatial context.

Though not related directly to the interpretive potential of settings per se, the Visitor
Experience and Resource Protection planning framework (U.S. Department of the Interior, 1997; Manning, 1999) used by the US National Park Service recognizes the need to address the identification of unique characteristics and important interpretive themes early on in the planning process while developing an area’s vision statement and the description of desired future conditions that anchor and guide the rest of the planning process. Understanding the interests, expectations, and setting preferences of visitors, and perceptions about current and potential management actions can help us understand and later communicate a site’s interpretive potential. This study wished to better understand the extent to which setting attributes serve as the medium or “from which” interpretive messages can be extracted and how they influence the diversity and content of interpretive messages.

In order to understand this and to be able to inform future planning decisions at Copan and similar WH sites, we examined visitor perceptions regarding the external and internal settings at CAP. Particularly, we examined preferred levels of restoration and naturalness within CAP and preferences for land uses that surround and directly affect the relatively small park. We attempt to relate these findings to the concept of interpretive potential and its protection and enhancement.

Study Area Background
In western Honduras, near the Guatemalan border, archaeological remnants are scattered across the Copan River Valley with none more spectacular than those at CAP—a monument to the artistic zenith of the Maya civilization. Copan, the ancient city-state, was a major center of trade, art, and religion in the Maya world. Today the archaeological park is Honduras’ second-most popular tourist destination and its only profitable national park. It was declared a World Heritage Site by UNESCO in 1981 and a national monument in 1982. CAP is managed by the Honduran Institute of Anthropology and History (Instituto Hondureño de Antropología e Historia, or IHAH).

In 1975, the Honduran government initiated a project, the Proyecto Arqueológico Copán, to enhance tourism revenues by restoring temples and palaces and also research the city’s ancient growth and development (Baudez, 1994; Sabloff, 1994). To date, the level of restoration and promotion at CAP has been successful and has turned Copán Ruinas into one of the most prosperous rural towns in all of Central America (Barborak, 2004). Tourism has increased tenfold since the late 1970s, when 10,000 visitors came to CAP (Fash, 2002; Informe Final del Año 2002, 2002). Copán Ruinas is one-kilometer west of CAP and 45 kilometers southwest (a two and a half-hour drive) of San Pedro Sula, the business capital of Honduras. The small but bustling town’s cobble-stoned streets are clean and safe and its central park serves as a meeting place for locals and tourists alike. The town currently has 41 small hotels that meet every budget and comfort level providing a total of 719 beds, while local restaurants cater to a diversity of tastes in the town’s compact but pedestrian-friendly center.

Unless one arrives by tour bus or private vehicle, most visits to CAP originate in the town. The 15-minute (one kilometer) walk from the town to the park provides time for geographic orientation and mental preparation. Although a good number of ruins have been restored within the 68-hectare archaeological park, others have not. In some places, gigantic ceiba trees (Ceiba pentandra), creepers, and grasses grow out of immense temples, allowing visitors to witness first-hand the passage of time and nature’s ability to
reclaim a city-state that once had over 10,000 inhabitants (Fash, 2001). The forest and agricultural landscape that surrounds the ruins filters most of the sounds of modernity. Birds and insects provide a natural soundscape and opportunities to see whitetail deer, toucans, and giant blue morpho butterflies are common in and around the park.

There are a variety of opinions on how both the park and areas between the park and town should be developed. Some archaeologists, tourists, local businesspeople, and managers would like to see most of CAP’s archaeological remnants developed and restored to the greatest extent possible. Some would like to see added tourism facilities and businesses near the park. They reason that this will attract even more tourists and generate more revenue, or that restored ruins are preferable because they bring more of the past to life. It is worth asking, however, how altering internal and external setting attributes will affect the interpretive potential of the site and ultimately, the quality of the visitor experience and the site’s ability to attract visitors.

Relevant Literature

Restoration at Cultural Sites
Throughout Mesoamerica, ruins like those at CAP have been restored with the hope of attracting more tourists. Kelleher wrote:

Even when relatively small numbers of affluent and educated people visited historic sites, elaborate reconstructions were carried out. For example, in the 20th century archaeologists reconstructed the Mayan temples at Chichen Itza in the jungles of Mexico’s Yucatan peninsula, as well as other remote ruins that could be visited by only the most dedicated travelers (2004, p. 7).

There are, however, multiple positive and negative consequences of restoring ruins and increasing tourism at small cultural sites. The welcome consequences include attracting more visitors, increased economic activity, and the expansion of nearby communities (Pedersen, 2003). One key negative consequence of restorations is that they initiate an accelerated rate of physical deterioration once earth and vegetative cover is removed and ruins are exposed to the natural elements. Feilden and Jokilehto (1998) point out that once exposed, sunlight and rain take a toll on restored (and non-renewable) archaeological remains, and that an overemphasis on tourism volume can lead to unjustified reconstructions. New restorations can also dramatically add to the fixed cost of operation and the need to increase staff presence, and they require monitoring. While earth and most vegetation can protect ruins that have not been unearthed, it must also be noted that large tropical tree roots near un-restored ruins may cause damage (Thompson, 1981).

Few, if any, studies have looked at visitor perceptions about differing levels of restoration. We do know that expectations about any site can shape the experience attained therein (Knudson, Cable, & Beck, 2003, Burde & Mayer, 1996). Even if one brings few expectations, according to Lipe’s comparative study of world cultural resource management, “When one encounters a cultural resource, the vision of the past that it evokes and the affect associated with the experience is highly conditioned, if not determined, by the other knowledge about the past that the participant brings to the encounter or that he is provided with on the spot” (1984, p. 4). For example, paint
peeling off the walls in a modern museum may signal lack of maintenance or even institutional financial difficulties. When visiting a Western ghost town, the visitor probably expects and even wants to see things in disrepair, replete with tumbleweeds blowing down the street. If the town were too well kept, it would lack a certain authenticity from the visitor’s point of view.

What about the case of Mayan ruins? What is the appropriate level of restoration? Do visitors expect, or are they also stimulated by and glad to find, non-restored ruins that provide the juxtaposition of nature and culture inherent in carved stones inextricably tangled with roots and vines? Does a walk through a traditional agricultural landscape before arriving at the ruins provide a setting that enhances the visitor’s experience any better than moving from an urbanized setting directly to entrance to the cultural site?

Linking Activities, Settings, Desired Experience Outcomes, and Benefits
This study is guided by the behavioral approach to analyzing the visitor experience, which holds that visitors to parks and protected areas are motivated to engage in activities in specific settings in order to make the achievement of desired experience outcomes more likely. Satisfying experience outcomes or motives in turn produces personal and social benefits (Manning, 1999). Sometimes referred to as Experience-Based Setting Management or Benefits-Based Management, this consumer-based approach has for three decades used quantitative methods to probe visitor activities, motivations, setting preferences, experience outcomes, and the links between them (Floyd & Gramann, 1997; Schreyer & Driver, 1989; Driver, 1975; Driver & Brown, 1975). The conceptual framework suggests that while managers cannot guarantee that desired experiences or benefits will be achieved, they can control the integrity and diversity of the physical, social, and managerial setting attributes with careful planning and zoning (Clark & Stankey, 1979; Brown, Driver, & McConnell, 1978). This makes it possible to offer a range of settings or experience opportunities, making it more likely that more visitors will achieve desired outcomes and benefits from their visit.

Although the relationship between setting and desired outcomes is often intuitive, the studies that have been conducted have produced only a modest confirmation of the link between them (Manning, 1999). With a few exceptions (Mayer, 2003; Wurz, 1996; Wallace & Smith, 1996), most studies using a behavioral approach have been in North America or Australia and few, if any, have taken place at cultural or archaeological sites where the range of motivations for visiting may be more specialized (Mayer, 2003) and where managers have a more specific mission and less latitude to provide for a variety of management zones or settings. Additionally, few studies have compared results for national and international visitors. Finally, studies that look at the relationship between setting and visitor experience outcomes have seldom used mixed methods that pair visitor interviews with quantitative survey data.

Methods

Study Objectives
To better understand the implications of possible changes to the internal and external setting at CAP, and in hopes of learning more about the specific links between setting and desired outcomes at an archaeological site like Copan, the study had the following objec-
tives: (1) to determine visitor preferences for both external and internal setting attributes; (2) to understand how changes in the external and internal settings might affect the intellectual and emotional impact of the ruins experience and the achievement of desired visitor outcomes, and; (3) to understand where interpreters might be able to influence the planning and management process in order to optimize the interpretive potential.

Because visits to a WHS like CAP can have profound affective, philosophical, or spiritual outcomes, the depth of such visitor experiences may be enhanced using both quantitative and qualitative research methods (Pedersen, 2003), providing what Berg described as different lines of sight directed at the same point (1998, p.4). A case study offers the opportunity for both “thick description” and a well-rounded perspective on the exemplar (Stake, 1995).

Two different surveys and two separate rounds of semi-structured interviews, along with participant observation were employed with visitors and residents of Copán Ruinas. Table 1 provides an overview of the data collection approaches.

The visitor survey was developed in collaboration with CAP managers, Honduran and U.S. protected area specialists from the Wildlife Conservation Society, and staff from the Center for Protected Area Management and Training at Colorado State University. The survey included questions on visitor characteristics, preferences for intensities of adjacent land use, the level of archaeological restoration, and specific management actions like tree removal. The survey was pre-tested with visitors and strengthened thereafter. Available in both English and Spanish, the survey was conducted between June and September 2002 each weekday and on weekends between 8 a.m. and 4 p.m. for 13 weeks as visitors exited the park. All visitors, with the exception of fixed-schedule guided tour groups, had an equal opportunity to participate. Residents of the town of Copán Ruinas were also surveyed to ensure that the perceptions of local people were included (McKercher & Du Cros, 2002). Descriptive statistics, chi-square, and analysis of variance (ANOVA) were used to analyze the effect of selected demographic variables on setting preferences.

Semi-structured interviews were conducted in 2002 during the peak of visitation (May–August) with exiting visitors or small groups and again in July 2003 with the latter being more structured (Manning, 1999; Berg, 1998; Furze et al., 1996). The second round of interviews used photo cues (Manning, 1999; Furze et al., 1996; Wallace & Trench, 1995; Whyte, 1995; Wallace, 1990) to help visitors envision a range of levels of restoration (Figures 1 and 2). Interviews were targeted and focused directly on study topics (Yin, 1998). Small groups were allowed to talk together about both their collective and individual experiences at the ruins. Interviews targeted visitor perceptions about: (a) the setting attributes like the juxtaposition of restored ruins and those being reclaimed by nature; (b) the appropriate level of restoration at the ruins as well as the experience outcomes derived

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Table 1. Data collection format, sample population, dates, and sample size.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Data format</th>
<th>Sample population</th>
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<tr>
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<td>3</td>
<td>Interviews</td>
<td>General population of CAP visitors</td>
<td>07/10/03—07/24/03</td>
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from the existing landscape, and (c) the adjacent landscape. Field notes were taken and then transcribed daily, while the second set of interviews was audio taped and transcribed verbatim. Free-form analysis (McQuarrie, 1996) was initially used to analyze responses into sub-theme categories relevant to study objectives. Three rounds of transcript review (open, axial, and selective coding) were used to code and improve the development and description of sub-themes (Neuman, 2000). In discussing themes, it is important to differentiate between interview themes (oft-repeated visitor preferences and perceptions) and interpre-

![Figure 1. Internal setting from non-restored to totally restored ruins.](image1)

![Figure 2. External setting from reforestation and agriculture to residences and businesses like modest and luxury hotels.](image2)
### Table 2. Sample characteristics by country of origin.

<table>
<thead>
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<th>Gender</th>
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<td>M = 12</td>
<td>M = 11</td>
</tr>
</tbody>
</table>

*Includes Honduran visitors both local and national
** Sample of Copán Ruinas residents only

### Table 3. Park buffer zone: development preferences by place of origin.

<table>
<thead>
<tr>
<th>Preference</th>
<th>Europeans</th>
<th>North Americans</th>
<th>Latin Americans*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 111</td>
<td>n = 69</td>
<td>n = 377</td>
</tr>
<tr>
<td>1. Agricultural</td>
<td>60%</td>
<td>48%</td>
<td>35%</td>
</tr>
<tr>
<td>2. Reforestation</td>
<td>38%</td>
<td>45%</td>
<td>36%</td>
</tr>
<tr>
<td>3. Town grow to meet park</td>
<td>1%</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>4. Tourist infrastructure</td>
<td>1%</td>
<td>1%</td>
<td>19%</td>
</tr>
</tbody>
</table>

*Includes Honduran visitors both local and national
** Sample of Copán Ruinas residents only

Pearson Chi-Square: 62.63, Cramer’s V: .18, p < 0.01

Scale: 1. The (private) land surrounding the CAP should be kept in some mix of natural and agric
2. The land surrounding the CAP should be returned to a natural condition like forest.
3. The town should be allowed to grow out to meet CAP.
4. Lands surrounding CAP should be dedicated to tourism related development like restau
retail stores.
tive themes (major points/messages about the inherent meanings of the resource) that make up the cornerstone of thematic interpretation (Ham, 1992).

Immersion in the community and the credibility that Peace Corps service granted the lead author allowed him to participate in planning meetings and events, and permitted full access to the ruins, park staff, and visitors. Additionally, the lead author was contracted to direct an updated marketing plan for CAP that reported that the primary motivation for visiting CAP among all groups was to learn more about Maya history and culture and to imagine what Maya life was like. Photographs of setting attributes and elements of the ruins experience, the shadowing of managers and guided tours, as well as conversations with key contacts were used to answer questions about CAP’s enabling legislation, public use, zoning, and restoration plans. Survey data, interview themes, notes, and photographs were used to help describe the relationship between setting, experience outcomes, and interpretive potential.

Findings

Visitor Characteristics
CAP visitors are young (most are under 35) and better educated than the general population in their countries of origin (Table 2). Excluding the sample of 125 people from Copán Ruinas (referred to as Copáneños), visitors to CAP came from Latin America (70%), Europe (18%) and North America (12%). Slightly more than half of the Europeans and Latin Americans were men while two thirds of the North Americans were men.

Setting Preferences for Lands around CAP
Currently, visitors walk through a rural setting on their way to CAP and this external setting is in a fairly natural state (primarily agricultural). However, the town has the potential to grow to the edge of the park. Survey respondents were given a multiple-choice question where they could indicate whether they preferred to see the private land surrounding CAP: (a) kept in some mix of natural and agricultural uses; (b) returned to a natural condition like forest; (c) allow more residential uses; or; (d) undergo tourism-related development like restaurants, lodging, or retail stores. Table 3 indicates that all visitor types showed a strong preference for maintaining a pastoral or forested buffer around the park ($\chi^2 = 62.63, p < 0.01$). Latin Americans were the more likely to approve of land use that includes more residences (10%), stores and tourist development (19%). Copáneños were nearly evenly divided in their preference for agricultural land use or reforestation (44% and 45% respectively). Overall results suggest that respondents showed a strong affinity for maintaining a natural or pastoral setting.

Interview informants later described their preferences for external setting attributes. Three main preferential categories emerged and corroborated the strong preference among all visitor segments for not intensifying land uses between the park and the town.

1. Many preferred adjacent agricultural or reforested landscapes for the aesthetic and transition effect they would provide. Many informants felt that reforested lands looked the best and some said the best way would be to reforest it all saying reforestation brings life and that they should always conserve green spaces and natural areas so despite changes there are always trees. (Pam, 18, Honduras).
The preference for forest restoration was nuanced. Many indicated that an external setting perceived as natural adds something to the visit that would be lost if land use intensified. Although a reforested setting was valued for its many benefits, an agricultural setting was tantamount to nature for urban visitors like Nicholas, 47, from Italy:

To reforest it is another solution, but the jungle reserve or the agriculture are both similar. They both appear alike to us—like nature. But they should never develop the town, because if the town grows wider, for me, that brings many problems for the people. There is money, and they can earn money…but if it stays like this, for me, it is best.

Others also preferred an external setting that includes nature elements and also where traditional farming is valued. Informants revealed a desire for an external setting that complements or blends with or transitions to the setting within the park while recognizing the needs of the local people. Laura, 47, from the USA, said, I looked out at the field and took pictures and saw the horses by the roadside…and that was part of the charm. Robert, 20, from Guatemala, considered an agricultural setting to also be an appropriate transition beneficial to both tourists and local area residents when he said, For me, reforested is close to perfect; however, an environment in the middle, like agriculture, is good too. This way the people can live without destroying the natural environment totally.

Emily, 20, from Honduras, said, It's just that you see a lot of [development] in the big cities. We lose what is Honduras—the green, the mountains, the trees. You lose a lot because it will look like any other place.

Regardless of their preference for a mix of rural land uses, there was wide agreement among respondents that the tourist infrastructure should be kept in town, away from CAP, and at an appropriate small-town scale. Roland, 21, from Guatemala, indicated a preference for a setting that was reforested, but more important to him was the need for maintaining the land as open space. He said:

The tourist center should be integrated into the town, and they should leave this space for forests. In between the town and the park they should leave a good space for the trees and reforestation. It is good to have various hotel options, but like I said, they should be separated from this place. They shouldn’t be up to the entrance of the ruins, nor even close to the ruins.

Several informants noted that an external setting that protects open space between the town and the park shows respect for the significance of the ruins and is valued as a transition zone between the cultural site and tourist infrastructure and commercialism. Fred, 37, from Spain, when asked about his setting preferences for the land around Copan, said:

What you have to understand is that Copan has to compete against other tourist destinations. If it’s too touristy, it becomes too exploited. It should be a fair combination between what the people need, but if they get rid of everything they like about this place it will attract less tourism….. they should respect the structure of place. Don’t build in just any place. Don’t build where there is forest. Don’t just build enormous buildings.
2. The walking path between CAP and Copán Ruinas was seen as helping to tie CAP to the scale and scope of Maya culture in the Copan Valley. Without any formal interpretive efforts present, visitors gleaned meanings from the setting and described interpretive messages that began to emerge even before they reached the park. The pastoral setting provides an intimate look at the Honduran countryside, linking past and present. As Gavin, 29, from the United States, replied:

It gives me a sense of the physical scope of the entire site. When I was walking here from town, and saw some of the outlying sites, I could sort of have a picture in my head that this city was really big. Here are some of the outlying parts of it. People must have either been living here, or these were places people went for certain kinds of activities. So, I felt I got something out of that in terms of the sheer size of the site, got a sense for the city. If it were urbanized, I would have a harder time sort of figuring out what is Copan now, versus the Maya city, and how big was it and where it was.

The walk through a non-motorized, non-commercial, agricultural/pastoral setting is seen to be a harmonious part of CAP’s attraction. Joe, a 33-year-old Guatemalan, described the antiquities and nature in all of their splendor as harmonious and the main attraction for his visit. He added that commercial development would alter the image and the feeling of the external setting.

3. Informants indicated a preference for intangible external setting attributes that are tied to the “in ruins” experience. A setting with more intensified land use—such as more residences and businesses—was perceived as a potential threat to the genius loci, or spirit of the place. A high value attached to the tranquil atmosphere inside the park linked to the importance of keeping noise, commerce, and modernity at a respectful distance—lest they detract from the ruins experience. Roland, 21, from Guatemala, made it clear why it is important to maintain separation (buffer zone) between the town and the park when he said:

It is fascinating because there are no car sounds. I think there are only the sounds of beautiful nature. It is a very calm and peaceful place to relax. It is a good place to meditate and leave the stress of the city.

Visitors linked the tranquility to the small-town charm of the town of Copán Ruinas. Charles, 25, of Copán Ruinas was asked if he felt the town growing larger would affect tourism. He said:

I think so. Now, many of the tourists come because it is peaceful and small and because after 10 p.m. you can sleep peacefully. You can still walk in the streets at 11 or 12 at night without problems. But if the town grows to a bigger size, things will change. It is possible that we will have thieves as well. These types of changes can change the flow of tourism. I don’t think that the town growing will help us much. Unfortunately it is difficult to stop it, but I think it would be best if we maintained it like it is now. The people come here and they say,
Copan isn’t a city, it is still a town. It is peaceful. It is still beautiful. But I don’t think the peace we have will last.

The forested and pastoral adjacent land setting was valued for its ability to protect natural sound, buffer urban sound and provide the tranquility that initiates reflection and information processing.

Internal Setting Preferences for Levels of Restoration and Maintenance

It is estimated that less than five percent of the Copan River Valley’s 4,500 archaeological mounds have been excavated, least of all restored. Within CAP there exist many ruins that have been restored and others that have been reclaimed by nature. To study the juxtaposition issue more closely, a dichotomous dependent variable was used to examine differences in long-term restoration preferences among visitors by country of origin (Table 4). Survey data revealed that, within the park, all visitor segments preferred retaining a mixture between restored ruins and those in the process of being reclaimed by nature ($x^2 = 12.99, \ p < 0.01$). Europeans and North Americans were similar in their strong preference for maintaining this combined setting and although the majority of Latin Americans and Copánecos preferred the combined setting, that preference was not as strong as it was for others.

One of the restoration actions being proposed by archaeologists was the cutting of trees that were growing on the non-restored ruins and in the surrounding forest to protect archaeological remnants. A survey item explained the reasons behind cutting the trees, and then asked respondents if this management action would add or detract from their experience. This item served as an additional indicator related to differing levels of restoration.

Figure 3 is a “bubble chart,” also known as the Potential for Conflict Index (Manfredo, Vaske, & Teel, 2003) and shows means and variances simultaneously with the size of each bubble denoting the degree of in-group consensus or potential for conflict (the smaller the circle, the greater the consensus of in-group opinion). The majority of respondents indicated that cutting trees would detract from their ruins experience. Europeans, North Americans, and Copánecos all indicated that cutting the trees that were

<table>
<thead>
<tr>
<th></th>
<th>Europeans n = 107</th>
<th>North Americans n = 70</th>
<th>Latin Americans* n = 387</th>
<th>Copánecos** n = 125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restore all eventually</td>
<td>30%</td>
<td>27%</td>
<td>44%</td>
<td>44%</td>
</tr>
<tr>
<td>Maintain contrast</td>
<td>70%</td>
<td>73%</td>
<td>56%</td>
<td>56%</td>
</tr>
</tbody>
</table>

*Includes Honduran visitors both local and national
**Sample of Copán Ruinas residents only

Pearson Chi-Square: 12.99 \ df = 3, Cramer’s V: .14, \ p < 0.01
Dependent variable: 1. Restore all ruins eventually
2. Leave a mix between restored ruins and ruins in process of being reclaimed by nature

Table 4. Setting attribute preferences for level of archaeological restoration within the park.

“Copan isn’t a city, it is still a town.” It is peaceful. It is still beautiful. But I don’t think the peace we have will last.

The forested and pastoral adjacent land setting was valued for its ability to protect natural sound, buffer urban sound and provide the tranquility that initiates reflection and information processing.
growing on the non-restored ruins would detract from their experience. Overall, Latin Americans were more neutral and the difference with other visitor segments was significant ($F = 5.69$, $p < 0.05$), but they also had the least in-group consensus. Copánecos were strongest in their opinion that a setting with fewer trees would degrade their experience.

Interview informants were asked about preferences regarding the appropriate mixture of restored and non-restored ruins at CAP. Photo cues depicted restored, partially restored and non-restored ruins. Four salient visitor preference categories emerged from the analysis of responses and are given here along with excerpts from the interviews.

1. The combined setting, with nature obviously present, retains the enchantment/mystery of the yet undiscovered and can enhance tranquility, introspection, and spirituality. Informants who had just experienced restored ruins and those in the process of being reclaimed by nature expressed emotional connections to the site. The experience of witnessing ruins in the process of being reclaimed by nature encouraged informants to go beyond the intellectual pursuit of facts into the realm of wonder and reflection. As Roger, 25, from England stated, The jungle has a more spiritual ambience to it rather than only a history museum…. It is fairly quiet and you can find a part you like and just absorb the atmosphere a little bit. It is tranquil. According to Anna, 28, Honduras, It is the trees that give the refreshing climate to this place, and if you cut them, you will see how they were built but you won’t see any of the nature. They bring a lot of tranquility to someone who comes here and you feel like you can relax. Thomas, 52, from the United States offered that
Nature cannot be separated. It is as important as the architecture. The sound of the birds is part of the enchantment of the place.

A setting that mixed forest and ruins evoked mystery and introspection for Jude, 57, USA, who said, These places can be doorways to your own inner self. Here [at the partially restored and non-restored ruins] there is mystery, just enough magic left to draw people in. The setting itself, with centuries-old trees and archaeological remains, without the aid of tour guides or interpretive signs, provided intellectual and emotional connections that promoted learning about the site and the self for a number of informants.

2. A combined setting helps to define the essence of what a ruin is, provokes thinking about the power of nature to reclaim and makes the passing of a civilization more apparent. Emotional and philosophical responses were common when informants were asked about the prospect of cutting trees from the temples and archaeological remains in order to protect them in the long term. One informant said, The image is better with the trees. When the Maya left, the jungle ate up the cities. It is very impressive to see the trees growing out of the ruins. (Luis, 56, Spain); I do not agree [with restoration that eliminates ruins with trees growing on them] because those trees are ancient and that part of the temples gives a different sensation. (Joe, 33, Guatemala).

The combined setting provoked reflection about sustainability and the human/nature relationship among those interviewed. Many informants drew from the setting distinct parallels between the collapse of the Maya, the use of natural resources, and the future direction of our own civilization. Patrick, 25, USA said, Part of the site should reflect how nature reclaims. It’s a damn good lesson actually. It is good to see the park surrounded by forest. It raises questions in my mind like, what are we doing today, what track are we on? (Steve, 33, USA); A setting perceived to be over-restored was seen to be sanitized, sterile, or inauthentic. Many informants equated advanced restoration with a loss of realism, a distortion of history, and a reduction in the affective aspects of what ruins are. Pete, 27, from Australia said, There always needs to be an element of realism and I think that when you start restoring it, you can pass the point where it becomes more about the form, and you lose a bit of realism; Everything should not be too perfect. (Donald, 60, Honduras); It would all be sanitized [with too much restoration]. (Dan, 25 England).

Interview results made it clear that visitors forged emotional and philosophical connections to the combined setting without any formal interpretive explanation.

3. Some restoration is essential as many non-restored ruins are inscrutable and do not allow visitors to engage in learning and imagining on their own. Maya structures in the form of tree-covered mounds are spread throughout CAP. To the untrained eye, these mounds can easily be mistaken for natural hillocks and were less understandable. Here the setting itself does not evoke cohesive interpretive messages or establish strong emotional or intellectual connections without further interpretation. Gavin, 29, from the USA said:

I think that the least touched, the least developed, is the least interesting. I can't picture what this looked like. I look at that, and I know that there was something there, some kind of building, but I have no idea about the dimensions, or what it was used for. Who knows? So leaving it untouched, I understand that
there are times when archaeologists choose to do that because it is the best way to preserve it, either for later restoration when we have better techniques or just because that keeps it underground and away from the elements. If archaeologists choose to do that, there needs to be lots of signs around or a lot of guides to explain. I feel like this needs the most educational infrastructure to help me interpret what this is.

Restored ruins more readily convey information about a piece’s original design and use and aid in establishing intellectual connections to the site. Some informants found that restored ruins were more comprehensible and revealed the design, artistry, craftsmanship, and ingenuity of the Maya. I think this [totally restored] one is very important. We can’t understand what the other ones are. We have no idea. But if first I see this one, then afterward we can appreciate more the other [semi and non-restored] ones. (Mary, 44, France). Another said, I imagined walking during the time of the Maya—watching rituals and imaging the clothing. When I was standing on top of the large [restored] pyramid, I imagined everyday life. (Wilmer, 21, Honduras).
Discussion and Recommendations

Most protected areas must sooner or later contend with increasing external and internal development pressures. At some level, development begins to deleteriously affect both resource protection and the visitor experience, creating dissonance that interferes with the reception of the site’s essential values, its messages, and its emotional and intellectual impact (Figure 4). Changes to a setting that guards the historical context of a site makes it difficult to imagine oneself in the time and place when the civilization thrived or when it began its decline. This is particularly true in the case of a small cultural site like CAP, which holds unique resources, and has both external pressure from urban expansion and the internal dilemma of how much restoration should take place and how many visitors should be accommodated.

CAP visitors appear to have motivations and desired experience outcomes that are closely tied to particular setting attributes that still exist but that are potentially threatened. The interpretive potential of the site itself or of the programs that might emanate from it may be diminished if the balance of restored and non-restored ruins is lost or if development intensifies adjacent to CAP. Setting attributes like those of the pastoral countryside separating the town and ruins can be seen as a form of interpretive media, especially if they are identified during the planning process, protected, and intentionally managed in a ways that communicate messages or themes that are in keeping with management objectives (Brochu, 2005). To do so will require that interpreters become more actively involved in the planning process than has often been the case.

External Setting and Interpretive Potential

CAP’s external setting provides a valued transition zone between the town and the park that primes the visitor experience and is bound to the interpretive potential of the park. The buffering mix of agriculture and forest is the raw material for several interpretive themes that tie to the “extant” natural and cultural contexts that have existed since the time of the ancient Maya at Copan (Schlesinger, 2001). The pastoral setting holds the potential for visitors to better understand local history and traditional agricultural practices including maize production and agro-forestry, the origins of which reach back to ancient Copan. It also protects a natural soundscape and night sky that were at the center of Mayan cosmology. The walk through this setting permits one to better envision the scope and scale of the valley during the time when the ancient Maya flourished—thereby providing context and extending the experience. Were this landscape setting to give way to hotels, vendors, and the automobile, there would be and increase in urban noise, emissions, and night lighting, a sharpening of both ecological and aesthetic gradients, and a loss of context that would reduce the effective size of the area and the breadth of available experience opportunities (Wallace, Barborak, & MacFarland, 2005).

Interpretive potential also has to do with cognition, information processing, and the ability to attend to an experience (Ham, 2007). Visitors report how the tranquil walk through a non-motorized, non-commercial, agricultural/pastoral setting enhanced their experience within CAP by stimulating inquiry, reflection, geographic orientation, and an increased sense of anticipation. They also appreciated the current size, scale, and level of tourist infrastructure in Copán Ruinas, and the fact that it is kept at a respectful distance from CAP.

If this setting is to be maintained, interpreters are called upon to be the “voice for
the resource” and advocate on behalf of these visitor setting preferences and the economic benefits they sustain as local master plans, zoning regulations, and development proposals that affect lands in the buffer zone are developed and reviewed. Fortunately, the legal framework for cultural sites in Honduras enables both local government and protected area officials to participate in land-use decisions (Wallace et al., 2005; Ley para la Protección del Patrimonio Cultural de la Nación. Decreto, 1997). Maintaining the mix of agriculture and forest or increasing reforestation may require the use of conservation easements, transferable development rights, or other incentives for landowners (Mayer & Wallace, 2007). In many countries, as governments decentralize planning functions to local governments, protected area staff will have the opportunity to become part of the newly forming local government land-use planning decision process where private or communal lands near protected areas are concerned. This opportunity for interpreters to sit at the planning table and serve as the “voice for the resource” may not present itself again after decentralizing decision frameworks crystallize (Wallace et al. 2005). Proposals for development both inside and outside CAP will continue for years to come and require that CAP staff, including interpreters, to routinely participate in planning and review processes and to remind stakeholders of the relationship between setting and market sustainability.

Internal Setting and Interpretive Potential
Maintaining interpretive potential and the quality of the visitor experience, while complying with IHAH and World Heritage guidelines and the physical constraints of CAP, can be achieved through careful visitor management and the use of distinct management zones within CAP. Both the 1984 and 2003 management plans call for zoning within CAP, but these plans have yet to be fully implemented. Zoning can help maintain the integrity of multiple settings and ensure that a diversity of visitor experiences and interpretive opportunities are available (Clark & Stankey, 1979; Brown, Driver, & McConnell, 1978). Visitors intuitively preferred settings that helped to preserve a rare history in its broadest context. To do this, site planners should consider a zoning strategy that distinguishes between intensive use, core archaeological, and natural archaeological zones that allows restored and non-restored ruins to exist in juxtaposition (Mayer & Wallace, 2007).

Restoration creates interpretive potential but can also remove it. Restored and non-restored ruins work together as interpretive media that protect the spirit of the place and provide a wider diversity of possible interpretive messages and experience opportunities. Perspectives about the passage of time, the collapse of the Maya, their use of natural resources, and the future direction of our own civilization depend on visitors being able to ponder the mix of restored, partially restored, and non-restored ruins. Visitors described how this combination also promotes a quality aesthetic experience and stronger emotional connections to the site, introspection, meditation, and spirituality. Preserving intangible qualities such as enchantment, the mystery of the still undiscovered, charm, and perceived authenticity can be accomplished by protecting tangible setting attributes like the nature/ruins mix, the presence and sounds of wildlife, quiet corners, and unobstructed views between restored and non-restored ruins and the countryside beyond. Silberman (2006) states that increasing the number of annual visits is not a sound rationale for undertaking archaeological restorations and reconstructions at
the expense of authenticity. Findings indicate that excessive restoration at Copan could actually depress visitor numbers. As before, interpreters who are a voice for the resource must now use that voice with local business interests, archaeologists, area administrators, and maintenance staff during the planning process and with day-to-day management decisions that affect setting and interpretive potential.

Study results also had implications for the programmatic interpretation made possible by the combined internal setting. Some visitors referenced the inscrutability of partially or non-restored ruins and needed help understanding what they were observing. Interpretation can subtly teach visitors “how to see” by comparing vegetation-covered mounds to similar restored structures or through the use of artistic renderings that depict what the site may have looked like. Such interpretation can reduce the need for restoration and disturbances to the archaeological record and natural surroundings. Partial restorations are aesthetically pleasing and evocative and should be judiciously interpreted. In spite of the rich potential to interpret the aesthetic qualities of partial restorations or philosophical questions of sustainability, the human nature relationship, and the recuperative powers of nature, many visitors perceived these things on their own from the “setting as media.” As one informant urged, “Do not over-interpret. Leave room for mystery and discovery.” Finished restorations complement un-restored and partially restored ruins by encouraging an understanding of the ancient Maya and their lifestyles at Copan. Visitors expect and seem comfortable with more programmatic interpretation in a setting containing reconstructions and replicas (identified as such) where guided tours can emphasize appreciation for Maya artistry, architecture, and construction.

Applying the broader view of interpretive planning

The International Council on Monuments and Sites Ename Charter: New Principles for Interpreting Cultural Heritage Sites calls for “integrated interpretive planning” that moves beyond the identification and presentation of artifacts or solely focusing on interpretive programs (Silberman, 2006). Visitors to Copan remind us that the setting itself must be planned for as it evokes feelings, implies messages, and provokes inquiry, and is therefore a de facto medium of interpretation worthy of our attention. At the same time, setting integrity is the “from which” that programmatic interpretation emerges. Interpretive potential as we have used it herein, is the potential of setting to create emotional or intellectual impact either on its own or to serve as a point of reference for the themes and messages of programmatic interpretation. Some combination of setting attributes that optimize interpretive potential can be recognized and planned for.

The interpretive potential concept is being applied to some degree in the U.S., where planning frameworks like the Visitor Experience and Resource Protection planning framework (VERP) are used. VERP asks that interpretive themes be identified early in the (general management or visitor) planning process. Input from interpreters is used when forming the description of desired conditions, management zones, and management actions (U.S. Department of the Interior, 1997). While VERP already expands the traditional notion of interpretive planning, we would go further and suggest that, for Copan and many other cultural sites, interpreters should provide input for both internal (site) planning and during the development of local government land use plans or the review of development proposals—both of which ultimately determine adjacent land use. Building on the work of Feilden and Jokilehto (1998) and Fagan (2003), we view the
cross-boundary involvement of interpreters in the local land use decision process as crucial for preserving site context or the relationship of an archaeological find in time and space to the things around it. Inappropriate development that results in a loss of context diminishes a site’s historic fabric and authenticity (Smith 2003; National Park Service, 2002).

Designated buffer zones, like the one at CAP legally enable managers (including interpreters) to participate in local planning. Even where designated buffer zones are absent, most local development review procedures provide an opening for the proactive involvement of interpreters who can help local government officials understand how zoning, permitted densities, designs standards, or allowable uses will affect the quality of the visitor experience and in turn, how the continued attraction of visitors to the community depends on maintenance of setting integrity. In marketing terms, a setting that provides appropriate levels of internal and external development and a rich interpretive potential at Copan and elsewhere is an economically significant product that will sustain visitation. Inappropriate development can only be addressed by participating in the review of development proposals, but managers must make it known to local officials that they wish to be part of that referral and review process.

In nearly all protected areas, internal site planning provides interpreters with the best opportunity to help fellow managers better understand site context, interpretive potential, and the intangible values that they are charged with protecting. Even if a planning process like VERP, which includes interpreters, is not used, interpreters have every reason to be at the table to describe how protecting a site’s interpretive potential expands experience opportunities, and connects visitors with the site in ways that furthers the areas mission. The proactive integration of interpretive, visitor management and general management planning emerges, for example when the descriptions for management zones are being developed. It is here that the concept of setting management or “experience design” informed by visitor research fits naturally into the planning process.

**Summarizing Thoughts**
The interpretive potential of Copan Archaeological Park resides in a seamless landscape that is both within and adjacent to the park and which provides context (Fagan, 2003; Smith, 2003). The *genius loci*, or spirit of the place, emanates from an optimal combination of valued internal and external setting attributes that visitors have helped us to articulate and which deserve careful consideration during the planning process. An expanded view of interpretive planning asks interpreters to become more involved in site and local land-use planning (Wallace et al., 2005; Mayer & Wallace, 2007), to incorporate an experience-based setting management approach into the planning process (Floyd & Gramann, 1997; Schreyer & Driver, 1989; Driver, 1975; Driver & Brown, 1975), and in general to provide a voice for the importance of setting and appropriate levels of development to interpretive potential. When this is effectively done, setting can serve as interpretive media in and of itself. This is not an entirely new idea. Tilden (1968) acknowledged that a preserved monument “speaks for itself” but does so partially in a language not understood by all visitors, thus requiring the help of interpreters to “give life to the ideas and images of material remains” (Silberman, 2006, p. 28).

To suggest that planning that provides an optimal combination of setting attributes is a form of interpretation, by no means reduces the importance of programmatic efforts.
We do advocate interpretive planning that both takes into account and responds to internal and external development pressures and protects and enhances the interpretive potential that subsequently enables programmatic efforts. Cultural resource managers who recognize the significance of their resources can more effectively interpret them. Finally, this expanded role for interpreters does raise the bar for the professional responsibilities given to and the skills required of interpreters. It also suggests the need for interpreters to be adequately exposed to social science methods, protected-area and land-use planning, and marketing theory at the university and professional levels.

Literature Cited


Abstract
Most research on the use of animals in zoo interpretation focuses on visitor knowledge and attitude change, with little emphasis on the characteristics of the animals used as interpretive tools. A synthesis of research was conducted to: (a) identify the characteristics of animals used as teaching tools in zoo interpretation and (b) determine the usefulness of such information to zoo and other non-formal interpreters. Most research on the use of animals in zoo interpretation involved large, active, exotic animals. Few studies have evaluated the effectiveness of native, locally relevant species as interpretive tools. When used in zoo interpretation, native species have the potential to help educators address locally relevant conservation issues. However, more research is needed on the use of locally relevant species in interpretation. Information on the effectiveness of native, readily available species would be useful to interpreters lacking the resources of larger zoos and using injured or imprinted local wildlife in education.
Keywords
animals as interpretive tools, zoo animal behavior, zoo animal characteristics, zoo animal geographic origin and type, zoo animal size and appearance, zoo education

Introduction
Educational programs that use live animals as teaching tools provide an experience incomparable to that of observing the same animals on video or in print. When used in non-formal educational settings, captive live animals can provide memorable, safe encounters with wildlife, increase relevance of conservation issues, increase program attendance, and allow educators to link environmental messages to specific species (Kloor, 2002; Swanagan, 2000; Zipko, 1993). Likewise, when used in formal (classroom) settings, live animals can be used to teach students about animal care, help eliminate misconceptions, and make science lessons more relevant by providing real-life examples of animals being studied (Greene & Greene, 2005; Page & Coppedge, 2004). In addition to providing an opportunity for hands-on learning, live animals in the classroom can be used to teach life skills such as critical thinking, responsibility, respect, and teamwork (Greene & Greene, 2005; Page & Coppedge, 2004; Wickless, Brooks, Abuloum, Mancuso, Heng-Moss, & Mayo, 2003). Both formal and non-formal educators who are somewhat uncomfortable with science topics can use animals to integrate student-centered scientific learning into their curriculum, while building confidence in their ability to teach science.

The use of animals in interpretation is a major part of the programming efforts of zoos and aquariums. To capture the attention and stimulate the interest of a diverse visitor base, Brewer (2001) called on educators to determine the most effective ways of translating the science of conservation biology to bring about public action. Using animals in interpretation has been one way to provide this translation. While most studies involving animals as interpretive tools in zoos and aquariums have investigated public perceptions of animals (Dierking, Burtnyk, Buchner, & Falk, 2002), one’s perception of an animal can be linked to the characteristics of that animal (Siegel, 2004). However, no examples in the literature exist comparing the characteristics of animals that have been used in zoo interpretation related studies. With such knowledge, an assessment of the utility of existing information to zoo and other non-formal interpreters can be made.

While animals are often described as having the “potential” to influence behavior change among participants of zoo education programs, little empirical evidence can be found linking the two (Dierking et al., 2002). However, those studies that do exist suggest that individuals who participate in programs using live animals are more likely to positively change their environmental behavior. For example, Swanagan (2000) reported that elephants used in live demonstrations significantly enhanced the likelihood that Zoo Atlanta visitors actively experiencing the presentation would support elephant conservation efforts by donating funds. Adelman, Dierking, Haley-Goldman, Coulson, and Adams (2001) found that when zoo visitors were prompted to think about the value of wildlife and made to feel empowered to help wildlife and the environment that they reported engaging in more environmentally responsible actions than prior to their zoo visit. Such actions included picking up garbage, composting, volunteering, putting up a bird feeder, planting trees, and visiting other zoos, nature centers, parks, and habitats (Adelman et al., 2001).

Animals have helped zoo and other non-formal educators influence public attitudes about conservation and stewardship (Davison, McMahon, Skinner, Horton, & Parks, 1993;
Swanagan, 2000; Yerke & Burns, 1991). However, what are the characteristics of such animals that help educators achieve the broader mission of zoos and environmental education of moving participants from awareness to action (Cronin-Jones, 2005; Henderson, 1984; Hudson, 2001)? An understanding of the relationship between zoo visitor attitude, likelihood of environmentally-related action, and the role that the characteristics of animals play in facilitating this relationship is thus needed. Comparing the characteristics of animals reported in zoo interpretation studies would not only help evaluate the utility of existing information to zoo and other non-formal interpreters, but would also appraise the current research base, identifying knowledge gaps and areas of overlap.

**Purpose and Objectives**

The purpose of this synthesis of research was to (a) identify the characteristics of animals used as teaching tools in zoo interpretation and (b) determine the usefulness of such information to zoo and other non-formal interpreters educating in zoos and in classroom settings. The specific research objectives, stated as research questions, were as follows:

1. What are the characteristics of animals that have been evaluated as interpretive tools in zoo education?
2. How do the characteristics of animals used in zoo and other non-formal education settings influence their effectiveness as interpretive tools?

**Procedures**

Sources were gathered through a library systems search at a major land-grant university. The search first included journals related to zoo visitor interactions, including *Anthrozoos*, *Environment and Behavior*, and *Zoo Biology* and was later expanded to include environmental education- and interpretation-related sources such as the *Journal of Environmental Education* and the *Journal of Interpretation Research*. Sources were categorized based on three criteria related to the characteristics of animals used in zoo-related education: (a) animal behavior, (b) animal geographic origin and type, and (c) animal size and appearance.

Although much anecdotal data exists on the use of live animals in zoo interpretation, procedures were used to focus this synthesis on empirical studies. Specifically, priority was given to publications employing experimental or quasi-experimental research designs.

**Findings**

*Animal behavior*

The behavior of animals used in interpretation activities influences the overall learning experience of participants (Bitgood, Patterson, & Benefield, 1988; Bitgood, Patterson, Benefield, & Landers, 1986; Kellert & Dunlap, 1989; Margulis, Hoyos, & Anderson, 2003). Because zoo visitors are often drawn to and seek out active, lively animals (Tunnicliffe, 1995; Wolf & Tymitz, 1980), on-site interpretive presentations provide visitors with the moving and easily viewable animals that they desire (Povey & Rios, 2002). Specifically, visitor interest and exhibit viewing time generally increase when educational animals are more active. Knowledge of the influence of animal behavior on learner interest and engagement is potentially useful to educators using animals as interpretive tools during classroom visits.

Using regression analysis to study zoo exhibit viewing time, animal activity was found
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Dependent measure examined</th>
<th>Whether the characteristic had an influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altman (1998)</td>
<td>Visitor engagement</td>
<td>No</td>
</tr>
<tr>
<td>Bitgood et al. (1988)</td>
<td>Visitor engagement</td>
<td>Yes</td>
</tr>
<tr>
<td>Johnston (1998)</td>
<td>Visitor engagement</td>
<td>Yes</td>
</tr>
<tr>
<td>Margulis et al. (2003)</td>
<td>Visitor interest and number</td>
<td>Yes</td>
</tr>
<tr>
<td>Tunnicliffe (1995)</td>
<td>Visitor conversations</td>
<td>Yes</td>
</tr>
<tr>
<td>Wood (1998)</td>
<td>Visitor interest</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Characteristic: Animal behavior**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Dependent measure examined</th>
<th>Whether the characteristic had an influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finlay et al. (1988)</td>
<td>Perceptions of animal stereotypes (exotic)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Johnston (1998)</td>
<td>Visitor engagement (exotic)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Margulis et al. (2003)</td>
<td>Visitor interest and number (exotic)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Morgan (1992)</td>
<td>Participant attitudes and knowledge (native)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Morgan and Gramann (1989)</td>
<td>Participant attitudes and knowledge (native)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Povey and Rios (2002)</td>
<td>Visitor engagement (exotic)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Shalev and Ben-Mordehai (1996)</td>
<td>Perceptions of snakes (native)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Swanagan (2000)</td>
<td>Support for conservation efforts (exotic)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Yerke and Burns (1991; 1993)</td>
<td>Participant attitudes and knowledge (native)</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

**Characteristic: Animal geographic origin and type – Exotic or Native** (in parentheses)

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Dependent measure examined</th>
<th>Whether the characteristic had an influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson et al. (2003)</td>
<td>Visitor engagement (otters)</td>
<td>No</td>
</tr>
<tr>
<td>Bitgood et al. (1988)</td>
<td>Visitor engagement (various)</td>
<td>Yes</td>
</tr>
<tr>
<td>Johnston (1998)</td>
<td>Visitor engagement (polar bears)</td>
<td>Yes</td>
</tr>
<tr>
<td>Knegtering et al. (2002)</td>
<td>Attitudes toward conservation (various)</td>
<td>Yes</td>
</tr>
<tr>
<td>Margulis et al. (2003)</td>
<td>Visitor interest (lions and tigers)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Characteristic: Animal size and appearance** (animal type in parentheses)

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Table 1. Summary of studies cited by animal characteristic, dependent measure examined, and whether the characteristic had an influence on the dependent measure.
to be one of the most critical factors influencing engagement (Johnston, 1998). When marginal changes in animal activity were assessed, increased animal activity resulted in visitors viewing zoo exhibits for longer periods of time (Johnston, 1998). Regardless of exhibit type (outside or inside; with or without viewing windows) and season (spring or summer), Margulis et al. (2003) reported greater zoo visitor interest and number when exotic cats were active. Similarly, Bitgood et al. (1988) found that zoo visitor viewing time at animal exhibits was approximately twice as long when animals were active than when they were inactive. In a study of visitor conversations about the behaviors of zoo animals, visitor comments included noting animal movement, position in an enclosure, feeding behavior, and “attention seekers,” such as playfulness (Tunnicliffe, 1995). Wood (1998) examined how visitors responded to chimpanzees (Pan troglodytes) and found that more active animals sustained public attention for longer time periods with the greatest visitor interest being in animal foraging and object use behaviors.

The specific type of animal activity and its relation to visitor learning was investigated by Altman (1998). She found only partial support for the hypothesis that increases in animal activity increase visitor attention. Finding that visitor conversations differed when polar bears (Ursus maritimus) were active compared to when sloth (Melursus ursinus) or spectacled bears (Tremarctos ornatus) were active, animal behavior was then separated into animated activity (climbing, running, splashing, and social interactions) and less animated activity (biting, eating, grooming, and walking) and analyzed. Contrary to results previously stated, animal activity, when broadly defined, was found to not necessarily hold visitor attention. Specifically, animated activity elicited the most attention to bear behavior, suggesting that certain types of animal activities may facilitate greater learning due to increased visitor attention (Altman, 1998). If the type of animal behavior influences conversation, perhaps educators could use animals with specific behaviors to generate interest in less appealing science topics.

Animal Geographic Origin and Type: Exotic or Native

The origin of animals used as educational teaching tools seems to influence the overall learning experience, although this was not reported specifically by any study. In fact, no direct comparison has been made between using exotic (from a country or mainland other than that where the education occurs) and native species in zoo interpretation. It is currently unknown whether using either an exotic or native species has an influence on the intended outcomes of zoo interpretation (see Table 1). An examination of the literature revealed that the majority of studies have examined the use of exotic animals in educational programs. The use of native species in zoo education was less prevalent in the literature. Knowledge of the influence of animal origin and type on the learning experience would be useful to interpreters hoping to increase awareness and the likelihood for conservation action regarding local and global environmental issues.

Exotic species seem to be the focus of most publications related to the use of animals as teaching tools. For example, elephants used in live demonstrations enhanced the likelihood that Zoo Atlanta visitors actively experiencing the presentation would support elephant conservation efforts (Swanagan, 2000). The activity level of exotic cats, including African lions (Panthera leo), amur leopards (Panthera pardus orientalis), amur tigers (Panthera tigris altaica), snow leopards (Panthera uncia), fishing cats (Felis viverrinus), and clouded leopards (Neofelis nebulosa) was compared to visitor interest at the Brookfield Zoo (Illinois) and
greater visitor interest was associated with more active cats (Margulis et al., 2003). Exotic clouded leopards used in traveling informal presentations throughout Point Defiance Zoo and Aquarium (Washington) resulted in increased visitor engagement and a more personalized learning experience when compared to leopards viewed in an exhibit (Povey & Rios, 2002). Bitgood et al. (1988) examined the relationship between animal characteristics and learner behavior at 13 different zoos throughout the United States. Of the 24 species included in their study, only four species (17%) were native to the lower 48 states, excluding two from Alaska; the remaining 18 were from countries other than the U.S. (Bitgood et al., 1988). Like Bitgood et al. (1988), Johnston (1998) justified examining visitor viewing time at polar bear exhibits because of the commonality of polar bears in zoos and their popularity with zoo visitors. He reported that longer exhibit viewing times were associated with zoos with greater numbers of large mammal species (Johnston, 1998).

Like Bitgood et al. (1988) and Johnston (1998), Finlay, James, and Maple (1988) used color slides of zebra, cheetahs (*Acinonyx jubatus*), orangutans, lions, Colobus monkeys (*Colobus guereza*), gorillas, Oryx antelope (*Oryx beisa*), and chimpanzees in their study because of the availability of such species, similarity to one another (e.g., orangutans, gorillas, and chimps), and use in previous zoo-related studies. They found that undergraduates perceived each of the animals with various stereotypes (Finlay et al., 1988). Knowing that the type of animal used in education influences learner perceptions, educators could use specific types of animals to address animal-related stereotypes and misconceptions associated with specific species (e.g., snakes and spiders).

Compared to studies involving exotic, more traditional zoo species, fewer studies have focused on the use of native species as teaching tools. Specifically, species often viewed with negative stereotypes and misconceptions seem to be more common in the literature.

Native snakes were the teaching tools in a study evaluating the influence of various wildlife education approaches on student attitudes and knowledge regarding snakes (Morgan, 1992; Morgan & Gramann, 1989). The study compared two educational factors relevant to zoo education: the amount of information about snakes provided to children and the level of involvement children had with snakes.

Student attitudes toward snakes were significantly affected by their level of involvement with snakes and the amount of factual information about snakes they were provided (Morgan & Gramann, 1989). In the absence of factual information provided in a slide show, viewing snakes in aquaria and watching an adult handle a snake resulted in more positive attitudes toward snakes. Without the slide show, allowing students to touch a snake was no more effective at improving student attitudes than viewing snakes in aquaria and watching an adult handle a snake. However, students who viewed the slide show, observed snakes in aquaria, watched an adult handle a snake, and were allowed to touch a snake did have substantially improved attitudes toward snakes. This study suggests that the direct contact opportunities with wildlife often provided during zoo animal encounters can be improved if interpreters continue to provide message-based reinforcement through accurate, easy-to-remember factual information.

Direct contact opportunities and message-based reinforcement were applied in a study on the use of native snakes as teaching tools with disabled children, adolescents with behavior problems, and the elderly (Shalev & Ben-Mordehai, 1996). Following a structured presentation during an initial visit where a snake was taken out of its cage and offered for touching or holding, a strong affiliation for snake interaction was found (Shalev & Ben-
When asked to choose among a snake, rabbit, and dog, a significant proportion of all children chose the snake. Given these results, the authors suggested that pet snakes be integrated into animal visitation programs with populations of varying ages and abilities (Shalev & Ben-Mordehai, 1996). Depending on the educational objectives of the interpretive presentation, perhaps native snakes may be beneficial if used as teaching tools in special education programs.

Yerke and Burns (1991) examined the impact of a flying birds of prey presentation on the attitudes and knowledge of zoo visitors. Although there was no significant difference in the percentage of correct answers to factual questions on birds of prey before and after the show, participants had more positive attitudes toward conservation and the importance of personally acting to protect wildlife immediately after the presentation.

A limited number of studies exist on the effectiveness of zoo outreach programs that use animals to convey environmental messages. Yerke and Burns (1993) evaluated the effectiveness of a zoo outreach program that used trained birds of prey in 30-minute assembly presentations at schools. Results indicated that fifth-grade students participating in the raptor program had more positive attitudes toward conservation (Yerke & Burns, 1993). In addition, more than half of the students reported talking with their families about saving wildlife after seeing the presentation.

**Animal Size and Appearance**

Along with geographic origin and type, the size of the animal used in education influences the learning experience. Although zoo educators visiting classrooms with animals are more likely to use smaller, easier-to-handle species, information on the effectiveness of larger animals may be helpful to classroom teachers when planning field trips to zoos.

Margulis et al. (2003) reported that larger, more familiar cat species (i.e., lions and tigers) generated higher zoo visitor interest independently of animal activity level. Smaller animals did not capture visitor attention regardless of activity level (Margulis et al., 2003). Similarly, Anderson, Kelling, Pressley-Keough, Bloomsmith, and Maple (2003) found that smaller (24 inches long) Asian small-clawed otters (*Aonyx cinerea*), when active, did not increase visitor engagement. Using black-and-white illustrations of non-controversial, indigenous species, Knegtering, Hendrickx, van der Windt, and Schoot-Uiterkamp (2002) reported a positive relationship between species relative size and the attitudes of nongovernmental organizations (NGOs) regarding species conservation. Specifically, NGOs in their study judged larger species of birds as most important.

Overall, larger, more active animals attract the most attention. Longer exhibit viewing times were associated with greater numbers of more visible, larger animals such as polar bears (Johnston, 1998). As reported by others, Bitgood et al. (1988) found that larger species of animals generated longer zoo exhibit viewing times than smaller species and reported a 0.88 correlation between average animal relative size and average viewing time.

The appearance of animals used during interpretation also influences the learning experience (Kellert & Dunlap, 1989; Knegtering et al., 2002; Tunnicliffe, 1995). Although NGOs tended to judge larger species as most important, Knegtering et al. (2002) suggested that smaller species with a charismatic appearance (such as butterflies) can elicit greater feelings of conservation importance when compared to other taxa. Tunnicliffe (1995) examined the conversations of elementary school students and accompanying adults when viewing animal exhibits in zoos. Exhibit viewers commented often on the appearance of the
animals, including their size and overall body shape (Tunnicliffe, 1995). Specifically, children and adults were drawn to parts of the animals that disrupted the body outline, including the tail, head, legs, and horns.

Larger, more traditional zoo animals are most often cited in studies involving the effectiveness of animals as interpretive tools. In addition, larger, more aesthetically appealing animals, sometimes referred to as “charismatic megafauna” (Rohlf, 1991), are most often evaluated. The use of local, native wildlife in educational programs has been cited less often.

Conclusions and Implications
This study identified and compared the characteristics of animals involved in zoo interpretation-related studies. Table 1 compares the literature discussed in this synthesis based on the animal characteristics examined in each study (animal behavior, animal geographic origin and type, and animal size and appearance) and whether the characteristic made a difference in the dependent measure of each study. An examination of Table 1 reveals that while clear associations exist between animal behavior and animal size and appearance and the intended outcomes of zoo interpretation, it is unclear whether animal geographic origin and type has an influence on such outcomes. Specific conclusions have been identified below for each initial research question.

**What are the characteristics of animals that have been evaluated as interpretive tools in zoo education?**
Most animals that have been evaluated as interpretive tools in zoo education were exotic to the location where education occurred. Most of these animals were large mammals such as bears and large cats. In fact, the focus of most studies was on the experience of the participant/visitor and not on comparing one species as a teaching tool to another. Information on the types of animals involved in many studies was found following review of the research methods employed. Few studies have focused on the use and effectiveness of native, locally relevant species in interpretation activities and programs. Studies reporting on the use of native species in education often focused on animals likely to have strong misconceptions associated with them (such as snakes and birds of prey).

**How do the characteristics of animals used in zoo and other non-formal education settings influence their effectiveness as interpretive tools?**
Much research exists on the relationship between the behavior of animals used in education and the overall learning experience of participants. In general, participant interest and exhibit viewing time increase when educational animals are larger and more active. Although not tested, whether an animal was exotic or native seemed to influence its effectiveness as a teaching tool and the overall experience of participants/visitors.

Although large, active animals used in educational settings such as zoos are more visible and attract more attention, results of such studies are of limited utility to zoo and other non-formal educators who use animals in classroom presentations. These educators are more likely to use smaller, easier-to-handle animals that pose few if any safety concerns and information on the effectiveness of such animals at improving attitudes and eliciting positive behavior change would be helpful.

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Recommendations

Although this study revealed that most research on the use of animals as interpretive tools in zoo educational activities and programs has focused on the effectiveness of larger, exotic, more traditional zoo species, such information is not helpful to the classroom teacher, extension agent, or zoo educator with classroom visitation responsibilities. More useful information to these audiences would include research on the effectiveness of animals more likely to be easily and safely handled or studied in a classroom aquarium, such as smaller amphibians, reptiles, and fish. Although much anecdotal, practitioner-based documentation exists on the use of various classroom animals in improving attitudes and enhancing the likelihood of environmentally responsible behavior change, is an animal with a particular characteristic more likely to improve attitudes and elicit positive behavior change over another? For instance, controlling for the influence of the educator, would an animal with a noticeable injury (injured animals are often used in zoo education programs) be more likely to influence attitudes and bring about behavior change over the same species of animal without a noticeable injury? Does species origin and type (exotic vs. native) have an influence on the intended outcomes of zoo interpretation? More research comparing the influence of individual animal characteristics on participant knowledge, attitude, and behavior change is needed.

Kreger and Mench (1995) made several recommendations regarding the use of common species in educational programs that are applicable to zoo and other non-formal educators and this study. When conveying messages related to the protection of a rare species, they suggest using a related common species because participants are more likely to care about and express fewer negative stereotypes toward a locally relevant animal (Kreger & Mench, 1995). Gippoliti and Amori (1998) argue that a greater emphasis on more common species in educational programs would allow participants to receive a broader view of the animal world (not being dominated by large, exotic animals as currently emphasized in zoos) and biodiversity. When used in zoo interpretation, common species have the potential to help educators address locally relevant conservation issues. However, more research is needed on the use of locally relevant species in interpretation. In addition, information on the effectiveness of native, readily available species would be useful to interpreters lacking the resources of larger zoos and using injured/imprinted local wildlife in education.

The findings from this synthesis of literature suggest several recommendations for practice. If animal activity significantly influences participant viewing time (with more active animals sustaining more interest), perhaps the interpreter should become more active (using more hand gestures or increased body movement) when using inactive, docile animals in interpretation. Given Altman’s (1998) findings concerning animated animal activity, an interpreter should reveal stories about an animal’s social interaction behaviors when using the animal in education to sustain participant interest. Finally, based on the findings of Kreger and Mench (1995) and Gippoliti and Amori (1998), when faced with the choice between using exotic and native species in zoo education, interpreters should strive to use more locally relevant, native species as ambassadors of the messages they promote.
References


Abstract
The National Park Service (NPS) developed a partnership with Amtrak in 1994 to offer interpretive programming for train passengers on selected routes. Since its inception, over 1.5 million passengers have attended nearly 60,000 presentations delivered by park rangers or trained volunteers. On-board presentations create a unique opportunity for the NPS to interact with many individuals who are not traditional park visitors. For Amtrak, interpretation is a value-added service. The purpose of this study was to evaluate passenger satisfaction of NPS-led presentations on two trains in the Midwest during the summer of 2005. A field experiment was designed to compare the responses of passengers in treatment (n=72) and control (n=80) groups using expectancy disconfirmation theory. Passengers were satisfied with all aspects of the presentations, including interpreter characteristics, message quality, and program benefits.

Keywords
interpretation, National Park Service, Amtrak, visitor satisfaction, evaluation

Introduction
The railroad industry played an important role in early national park development (Johns, 1996). In 1870, the federal government sent the Washburne-Langford-Doane expedition into Yellowstone to confirm the existence of “hellish” features described by fur trapper John Coulter. Members of this party
found not only spectacular scenery, but also discussed ways to save the area for public enjoyment—consistent with the notion of democratic idealism that is often associated with the preservation movement (Wellman & Probst, 2004). However, some historians believe that officials from the Northern Pacific Railroad (NPR) originated the national park idea and lobbied for its support (Zaslowsky & Watkins, 1994).

After the 1870 expedition, NPR sponsored Nathaniel Langford to give public lectures about his travels in Yellowstone. In 1871, artist Thomas Moran received financial assistance from NPR to accompany the Hayden survey to sketch the landscape (Runte, 1979). After the park bill was introduced into Congress, officials from NPR asked Ferdinand Hayden to support a public park in the great geyser basin. Professor Hayden gave a detailed account of the area to the House Committee on Public Lands. According to Runte (1979), Hayden’s testimony, along with Langford’s article in *Scribner’s Monthly* and the watercolor prints by Moran were influential in passing the Yellowstone Park Act, signed into law on March 1, 1872, by President Ulysses S. Grant.

Although the intentions of NPR were profit motivated, the relationship between national parks and railroads was mutually beneficial (Kraft & Chappell, 1999). After Congress passed the Yellowstone legislation, it did not appropriate any funds for park operations. Since revenues could not be obtained from resource extraction, tourism provided the only economic justification for these scenic, but otherwise “worthless” lands (Wellman & Probst, 2004). Population centers on the east coast were far removed from Yellowstone National Park, so Congress relied heavily on NPR to promote, transport, and to provide overnight lodging for train passengers (Runte, 1979). After the first eastern “dudes” arrived at Yellowstone in 1883, this model was emulated by other national parks, such as Glacier, Yosemite, Grand Canyon, and Zion (Kraft & Chappell, 1999). Congress funded the *See America First* campaign in 1915, which benefited the railroad industry because it promoted nationalism via scenery. In turn, railroad companies supported the National Park Service Act of 1916 (Runte, 1979).

Prior to World War II, four railroads served Yellowstone National Park. However, each of these companies discontinued train passenger service from 1948 to 1972 because of declining attendance (Kraft, 1999). Although this closure signaled the end of railroad-based tourism, park visitation rose steadily because of increased use of automobiles. The lodges built by railroad companies serve as reminders of a bygone era, but other facilities, such as cafeterias, have been converted into different uses or disappeared altogether (Shea, 1999). To recognize the significance of train travel in the U.S., the National Park Service (NPS) acquired several properties to preserve and interpret railroad history: Golden Spike NHS (1957); Allegheny Portage Railroad NHS (1964); and Steamtown NHS (1988).

**Trails and Rails Partnership**
The most recent development to renew the tradition of railroad-park tourism in the U.S. is the Trails and Rails Partnership (TRP), a cooperative venture between the NPS and Amtrak. This free service allows passengers the opportunity to attend interpretive programs on the natural and cultural heritage along selected train routes. Although national parks are featured on these trips, other sites and information are included in the presentations. Currently, 18 trains offer this type of service across the nation, but plans are underway to expand these offerings in the near future. Since its inception in 1994, over 1.5 million passengers have attended nearly 60,000 interpretive programs delivered by park rangers or
trained volunteers. In 2005 alone, approximately 425,000 passengers heard over 2,000 programs nationwide (National Park Service [NPS], 2006).

Interpretive programs on trains create a unique opportunity for the NPS to interact with a potential audience of 22 million people, many of whom are not traditional park visitors. On-board presentations can reach a diversity of train passengers, including minorities, senior citizens, international visitors, and those of lower socio-economic status. For Amtrak, interpretive programs are a value-added service that may encourage ridership (NPS, 2002). Anecdotal evidence suggests that passengers enjoy the presentations, but they have not been evaluated on a formal basis. Much information can be gained from measuring satisfaction of the TRP, including some policy implications for the NPS and Amtrak.

Literature Review
Visitor satisfaction is discussed frequently within the interpretive profession (Knapp & Benton, 2004), but there are relatively few studies in the literature that examine this topic (Morgan et al., 2003; Ham & Weiler, 2002; Geva & Goldman, 1991; Hughes, 1991). Perhaps the reluctance of interpreters to quantify visitor satisfaction is universal. Beckmann (1999, p. 16) noted that most park agencies in Australia tend to evaluate “satisfaction with facilities rather than satisfaction with interpretation.” Based on interviews with naturalists at national parks, Knapp and Benton (2004) developed four themes associated with successful interpretation: 1) relating to the visitor, 2) innovative techniques, 3) basic program needs, and 4) community outreach. According to other authors, successful interpretation is equivalent to program development (Ham, 1992) or training modules (Brochu & Merriman, 2001).

One problem of using a “top-down” approach, as noted by Knapp and Benton (2004), is to assume that satisfaction occurs without seeking audience confirmation. Successful interpretation should rely on input from visitors and agency staff—not exclusively one or the other.

Studying the visitors who participate in interpretive services can yield some valuable insights for program managers. For example, Knudson et al. (2003, p. 368) noted that visitors can supply information such as, “what they do and what they wish they could do, what they learned and what they’d like to know, how we did as interpreters and how they’d like us to do better.” According to Ham and Weiler (2002), being able to provide satisfactory experiences to visitors is contingent upon the ability to understand how they perceive quality. If the audience is not satisfied, they are likely to leave interpretive programs and may not return. Additionally, dissatisfaction may cause negative publicity through word-of-mouth communication. Although satisfaction of interpretive programs is a multi-dimensional construct, the literature seems to focus on three areas: characteristics of the interpreter, quality of the message, and benefits of the program.

Interpreter Characteristics
Of the many factors related to “successful” interpretation, perhaps none is more crucial than the leader/guide (Arnould & Price, 1993; Geva & Goldman, 1991). According to Ham and Weiler (2002), interpreters assume a pivotal role in facilitating “quality” experiences for visitors. Weiler (1999) reported that visitors were overwhelmingly satisfied with the tour guides because of their communication skills and conservation messages. Visitors expect naturalists to be friendly, knowledgeable, enthusiastic, confident, and organized, and possess good communication skills (Morgan et al. 1997; Sylvia et al., 1995). Many of these attributes were identified by Knudson et al. (2003) as components of effective public speaking.
Ham and Weiler (2002) examined the underpinnings of “quality” in nature-based tour guides by studying some passengers on cruise ships. Tourists were asked to describe the essential qualities of a “great” guide through a series of open-ended questions. A list of 35 attributes was generated and categorized into eight dimensions: knowledgeable, good communicator, enthusiastic, personable, local experience, time management, adaptable, and group management. Since the number of favorable comments about tour guide performance far outweighed the negative responses, Ham and Weiler concluded visitor satisfaction was achieved in this setting.

**Message Quality**

According to Tilden (1977), “The story’s the thing.” This means that presentations should be carefully structured to enhance communication with visitors. Ideally, messages should be relatively short (containing about seven chunks of information) and woven into a larger theme (Ham, 1992). Despite the fact that messages are an important component of interpretation, they have received less attention by researchers. Perhaps this is due to the uniqueness of presentations and the difficulty of constructing a rating instrument that can measure interpretive effectiveness at different locations. For example, Sylvia et al. (1995) asked participants to evaluate the importance of several program elements (active involvement, season offered, length, day offered, class size, registration fee, and inclusion of children), but these same items may not be applicable to other presentations.

Knudson et al. (2003) listed some characteristics of effective interpretive presentations: interesting introduction, clear theme, organized, effective use of visuals, application of interpretive principles, diversity of communications strategies, accuracy of information, memorable, effective conclusion, audience reaction, and involvement. Some of these items may be difficult to measure because they are not mutually exclusive. For example, “organized” can refer to the presenter or message. Visitors might find it hard to separate these components, unless told otherwise.

**Program Benefits**

Since interpretation is a learning experience that occurs at informal settings and involves non-captive audiences, it is more characteristic of recreation than education (Knudson et al., 2003). Recreation is considered to be a goal-directed behavior (Crandall, 1980). Motivations are the underlying reasons for participation, whereas benefits are thought to be the outcomes of experiences (Mannell & Iso-Ahola, 1987). If benefits are obtained, then a feeling of satisfaction is likely to develop (Holland & Ditton, 1992). Therefore, motives for attendance at interpretive programs can result in satisfaction if this same reason is attained during or after participation. Although motive-based studies can be important for market segmentation, they may not be a good indicator of satisfaction unless post-program evaluation occurs.

Absher and Graefe (1997) indicated that get away/escape, fun/good times, socialize, nature/harmony, and learning were the primary motives of visitors at Delaware State Parks. However, the authors found that the motives of individuals who participated in interpretation were different from those who did not attend the programs. Participants were focused more on nature/learning, whereas non-attendees scored higher on get away/escape and fun/good times. Focusing on the “needs” of participants can be an important strategy to increase their level of satisfaction with interpretive programs.
Learning is often associated with leisure (Roggenbuck, Loomis, & Dagastino, 1990), but this concept is poorly understood in outdoor locations since education can be a motive or an outcome of interpretive programming, depending on how it is measured. Some visitors may not want education. For example, Morgan (2000) found that visitors were less interested in education than what educators believed they would be in a zoological park setting. In fact, zoo visitors reported learning to be a lower priority than recreation. If the zoo staff wants to promote education, then efforts should be focused on a needs-based approach—ways to make learning “fun” for visitors.

### Measuring Visitor Satisfaction

According to Ham (2004), successful interpretation is achieving what was intended, but if research does not accompany this process, it may be nothing more than wishful thinking. Morgan et al. (2003) asked some canoeists about some perceived recreation “needs” (enjoy nature, reduce stress and tension, practice my skills, etc.) before and after participation in a naturalist-led, interpretive program. A comparison of expectations and outcomes yielded significant differences between pre- and post-program conditions, thus indicating a high level of visitor satisfaction.

Another way to measure success is to determine if performance matches expectations, otherwise known as an appraisal-based assessment (Bultena & Klessig, 1969; Stanley, 1972; LaPage, 1983). Appraisal studies are common because visitor satisfaction is more complex than mere fulfillment of needs (Tian-Cole et al., 2003). The most widely used approach to measure customer satisfaction is the expectancy disconfirmation theory, as proposed by Oliver (1980). According to this theory, customers purchase goods or services with expectations about performance in mind. After purchase behavior, outcomes are compared with expectations to determine if satisfaction (or dissatisfaction) occurs (Oliver, 1997). When outcomes match expectations, then confirmation occurs. Disconfirmation results if there is a difference between expectations and outcomes. There are two possible outcomes of disconfirmation: negative (meaning that performance was less than expected) or positive (meaning that performance was better than expected). See Figure 1. Although the expectancy disconfirmation theory is a good way to measure satisfaction, it has not been reported in the interpretation literature. Perhaps this omission is due to semantics, referring

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**Figure 1. Disconfirmation grid between expectations and performance.**

<table>
<thead>
<tr>
<th>Expectation</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Zero Disconfirmation (confirmation)</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Positive Disconfirmation</td>
</tr>
<tr>
<td></td>
<td>Negative Disconfirmation</td>
</tr>
<tr>
<td></td>
<td>Zero Disconfirmation (confirmation)</td>
</tr>
</tbody>
</table>
to visitors as “customers.” However, since the number of fee-based interpretive programs is increasing, it might be wise to re-think this issue.

The purpose of this study was to determine passenger satisfaction of NPS-led interpretive programs on Amtrak trains using the expectancy disconfirmation theory. Specifically, it compared the responses of attendees before and after the presentations using a quasi-experimental design. It was hypothesized that no significant differences would occur between the treatment and control groups for any dependent variable.

Methods

Program and Subjects
Two Amtrak train routes in the Midwest were selected by the NPS for inclusion in the TRP: one from St. Louis, Missouri, to Jefferson City, Missouri, and the other from St. Louis, Missouri, to Springfield, Illinois. Interpreters on the Missouri route conducted a presentation on the natural and cultural history along the Missouri River—focusing on the Lewis and Clark expedition. The Illinois train program featured Mississippi River heritage, the Civil War, and two former presidents (Abraham Lincoln and Ulysses S. Grant). Shortly after the trains departed St. Louis, announcements were made over the public address system to stimulate passenger awareness of the programs. Those wanting to attend the presentation were directed to specific locations on the respective trains. Each program lasted about two hours, depending upon the level of audience involvement (number of questions and their interest with objects in the traveling trunk). All presentations were delivered by NPS rangers or NPS volunteers (mostly retirees).

The sample consisted of passengers who attended an interpretive program on either train between May 28 and September 5, 2005. A purposive sample was used since it targeted a group of individuals for a specific reason (Babbie, 1973). Every adult passenger who attended a presentation was asked to complete a questionnaire. Questionnaires were completed on the trains and participation was anonymous.

Experimental Design and Treatment
Field experiments are designed to measure the effect of an independent variable in a naturalistic setting (Roggenbuck, 1979). Ideally, measurement should occur without the subjects having any knowledge of the treatment. Although field-based studies can provide an element of realism (higher external validity), it is virtually impossible to control every extraneous variable (lower internal validity). However, tighter controls often mean that subjects become aware of the experiment and may not act naturally. Since there is a degree of tension between these factors, some trade-offs are inherent.

This study used a quasi-experimental design known as a static-group comparison (Campbell & Stanley, 1963). Its purpose is to compare individuals who were exposed to a treatment versus those who were not. In this case, the interpretive presentation was the treatment. Since the control group could not be denied access to the treatment, the timing of measurement was altered to create this effect. After extensive training, interpreters were told to ask each passenger that attended the program to complete a questionnaire either before the presentation started (control) or after it had been completed (treatment). To facilitate this process and avoid possible confusion, each train (outbound vs. inbound) was pre-assigned to one of these two conditions. After reaching their destination, interpreters
disembarked and while returning to St. Louis on the next train, delivered the program in reverse order to a new set of passengers. All the testing materials were kept at the Amtrak station in St. Louis, a hub for trains departing in either direction. It also served as a repository for questionnaires after the interpreters returned.

**Questionnaire**

Two questionnaires were developed to compare the responses of train passengers. Each survey instrument was three pages long and it took individuals less than 10 minutes to complete the one they were given. The first few questions asked passengers about some background information on train travel: number of trips taken in the last 12 months, starting and ending points, weekday vs. weekend trips, motives, and awareness of the partnership between NPS and Amtrak.

The questionnaires were identical except for verb tense (future vs. past) for items that examined interpreter characteristics, message quality, and program benefits. The word “expectation” was used for the control group and “satisfaction” in the treatment condition. Each of these statements were measured on a five-point rating scale, using the adjectives strongly disagree to strongly agree (coded 1–5, respectively). A similar protocol has been used previously to evaluate interpretive programs (Morgan et al. 2003).

The section on interpreter characteristics was based on previous research (Sylvia et al., 1995; Morgan et al., 2003; Ham & Weiler, 2002). Because of the specialized conditions on Amtrak trains, all of the attributes identified in prior studies were not applicable. In contrast, some of the items not mentioned in the literature seemed to be appropriate for this study. The final list of interpreter characteristics used in this study included: knowledgeable, enthusiastic, professional, good communicator, good use of body language, spoke loudly/clearly, and skilled in asking questions.

The third section of the questionnaire dealt with message quality. Several of the items mentioned by Knudson et al. (2003) were used, but some of them did not apply to train presentations. Two items used by Ham (1992), “enjoyable” and “personally relevant,” were added to the list. The scale for measuring message quality consisted of the following items: informative, clear message, well-organized, hands-on approach, personally relevant, attention getting, entertaining, and creating a pleasant memory.

The next section contained some motives (and potential benefits of attendance): to learn something new, to promote learning (for kids), to meet some different people, to spend quality time with others, to have some fun, and to escape boredom. Some of the items were borrowed from the study by Absher and Graefe (1997), while others were derived from Morgan et al. (2003).

The final portion of the questionnaire asked passengers about their demographic information, and gave them an opportunity to provide some unstructured comments. These questions included gender, age, education level, ethnicity, size of travel party, zip code, and home country (if international visitor).

**Limitations**

- This study measured some passengers on two trains during the summer of 2005. These results from are not generalizable to other trains, interpretive programs, or seasons of the year.
Intact groups were used since passengers could not be selected or assigned on a random basis to control or treatment conditions.

A pre- and post-test design was not used because some passengers did not stay for the entire program, while others arrived after the presentation started.

Multiple interpreters delivered the same presentation, respective to each train.

### Results

#### Response Rate

A total of 162 questionnaires were distributed to program participants on the Missouri and Illinois trains. Every attendee was asked to complete one version of the questionnaire (either pre- or post-program). Since only five passengers refused to participate in the study, nonrespondent bias was considered to be minimal. Of the 157 individuals who returned their questionnaires, five were invalid due to insufficient data. The adjusted sample size was 152 passengers (72 pre- and 80 post-program questionnaires), yielding an overall response rate of 96.9%.

#### Demographics and Travel Patterns

The average respondent was a middle-aged (\( M = 47.7, SD = 15.0; n = 146 \)), female (65.3%) who lived in the Midwest (84.1%). Most of the participants were Caucasians (86.6%) and a few were Black (10.6%). Nearly 60% of the sample (58.3%) had at least some college education, with 33.6% earning a bachelors degree. More than two-thirds of the passengers (71.4%) were traveling with companions. On average, there were about four people per travel party, but every individual did not necessarily attend the presentation. Almost half of

### Table 1. Paired t-tests measuring interpreter characteristics, message quality, and program benefits of the presentations.

<table>
<thead>
<tr>
<th>Factors</th>
<th>N</th>
<th>Diff. Means</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpreter Characteristics vs.</td>
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<td>0.11</td>
<td>2.5</td>
<td>0.014*</td>
</tr>
<tr>
<td>Message Quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpreter Characteristics vs.</td>
<td>141</td>
<td>0.32</td>
<td>7.1</td>
<td>&lt; 0.001***</td>
</tr>
<tr>
<td>Program Benefits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Message Quality vs. Program</td>
<td>142</td>
<td>0.20</td>
<td>3.7</td>
<td>&lt; 0.001***</td>
</tr>
<tr>
<td>Benefits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* \( p < 0.05 \)

** \( p < 0.01 \)

*** \( p < 0.001 \)
the program participants (45.9%) brought their children along. Mostly, family groups consisted of one (17.1%) or two (15.1%) children.

Respondents were asked about the purpose of their trip. Reasons for train travel included: sightseeing (50%), visiting friends or relatives (34%), working/business (6.0%), sporting event (3.3%), shopping (4.7%), school related (2.7%), or miscellaneous purposes (20%). The most commonly reported amount of train travel in the past 12 months was a single trip (65.1%), followed by two trips (22.1%). The frequency of train travel ranged from one to 16 trips. Relatively few people (10.7%) were aware of the NPS and Amtrak partnership. Less than 10% of the passengers had attended more than one presentation.

Validity and Reliability
The questionnaire was reviewed by several individuals before administration and changes were made based on their recommendations. A series of paired t-tests were performed to

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>n</th>
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<th>df</th>
<th>t-value</th>
<th>p-value</th>
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<tr>
<td>Professionalism</td>
<td>Control</td>
<td>64</td>
<td>4.53</td>
<td></td>
<td>2.37</td>
<td>.020*</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>76</td>
<td>4.72</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledgeable</td>
<td>Control</td>
<td>65</td>
<td>4.48</td>
<td></td>
<td>1.97</td>
<td>.051</td>
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<td>Treatment</td>
<td>77</td>
<td>4.68</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speak loud/clear</td>
<td>Control</td>
<td>65</td>
<td>4.46</td>
<td></td>
<td>1.48</td>
<td>.143</td>
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<td>4.61</td>
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<td>Good communicator</td>
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<td>Enthusiastic</td>
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<td>1.15</td>
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<td>Treatment</td>
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<td>4.66</td>
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</tr>
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<td>Body language</td>
<td>Control</td>
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<td>1.08</td>
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<td>Treatment</td>
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<td>4.48</td>
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<tr>
<td>Asking questions</td>
<td>Control</td>
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<td></td>
<td>0.16</td>
<td>.876</td>
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<tr>
<td></td>
<td>Treatment</td>
<td>75</td>
<td>4.45</td>
<td>1</td>
<td></td>
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</tr>
<tr>
<td>TOTAL</td>
<td>Control</td>
<td>65</td>
<td>4.47</td>
<td></td>
<td>1.69</td>
<td>.094</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>78</td>
<td>4.61</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < 0.05

Table 2. T-tests for pre- and post-program scores by interpreter characteristics.
determine if the *a priori* domains were independent. Since the constructs were mutually exclusive (*p* < 0.05 in all cases, Table 1), a high degree of validity was assumed. Cronbach’s alpha was used to measure scale reliability. Each of the three domains, interpreter characteristics (*α* = 0.911), message quality (*α* = 0.948) and program benefits (*α* = 0.806) yielded high correlation coefficients.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>df</th>
<th>t-value</th>
<th>p-value</th>
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<tr>
<td>Hands-on approach</td>
<td>Control</td>
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<td>4.20</td>
<td>76</td>
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<td></td>
<td></td>
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<tr>
<td>Personally relevant</td>
<td>Control</td>
<td>63</td>
<td>4.00</td>
<td>74</td>
<td>4.43</td>
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</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>74</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Informative</td>
<td>Control</td>
<td>66</td>
<td>4.41</td>
<td>77</td>
<td>4.64</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>77</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear message</td>
<td>Control</td>
<td>65</td>
<td>4.31</td>
<td>76</td>
<td>4.55</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>76</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entertaining</td>
<td>Control</td>
<td>63</td>
<td>4.25</td>
<td>77</td>
<td>4.47</td>
<td>1</td>
</tr>
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<td></td>
<td>Treatment</td>
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<td>Organized</td>
<td>Control</td>
<td>64</td>
<td>4.41</td>
<td>76</td>
<td>4.59</td>
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<tr>
<td></td>
<td>Treatment</td>
<td>76</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pleasant memory</td>
<td>Control</td>
<td>66</td>
<td>4.36</td>
<td>76</td>
<td>4.54</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>76</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holds attention</td>
<td>Control</td>
<td>63</td>
<td>4.33</td>
<td>76</td>
<td>4.47</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>76</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
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<td>78</td>
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<td>Treatment</td>
<td>78</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

* *p* < 0.05  
** *p* < 0.01  
*** *p* < 0.001

Table 3. *T*-test for pre- and post-program scores by message quality.
Prior to testing the hypotheses, several comparisons were made between the control and experimental groups. It was expected that passengers would be similar on their demographic profiles. A total of six tests were conducted using both parametric and nonparametric statistics. Four t-tests revealed no significant differences between the groups on: age ($t = 0.94; df = 144; p = 0.35$); education level ($t = 0.56; df = 142; p = 0.58$); trips taken ($t = 0.59; df = 147; p = 0.56$) and programs attended ($t = 0.50; df = 144; p = 0.62$). Two Chi-square tests showed no significant differences on gender ($X^2 = 1.98; df = 1; p = 0.16$) and ethnicity ($X^2 = 0.35; df = 2; p = 0.84$). Based on these test results, the two groups were thought to be similar—except for exposure to the interpretive presentation.

The overall mean for interpreter characteristics was non-significant after comparing the treatment group with the control condition ($t = 1.69; df = 1; p = 0.094$). Of the seven items in this category, only professionalism was statistically significant. Although each

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>df</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meet new people</td>
<td>Control</td>
<td>63</td>
<td>3.49</td>
<td>1</td>
<td>3.27</td>
<td>.000***</td>
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<td></td>
<td>Treatment</td>
<td>72</td>
<td>4.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Escape boredom</td>
<td>Control</td>
<td>64</td>
<td>3.84</td>
<td>1</td>
<td>3.34</td>
<td>.000***</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>74</td>
<td>4.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spend time w/others</td>
<td>Control</td>
<td>64</td>
<td>3.72</td>
<td>1</td>
<td>2.47</td>
<td>.015*</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>73</td>
<td>4.11</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Promote learning (kids)</td>
<td>Control</td>
<td>61</td>
<td>4.26</td>
<td>1</td>
<td>2.48</td>
<td>.015*</td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td>73</td>
<td>4.58</td>
<td></td>
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<tr>
<td>Have fun</td>
<td>Control</td>
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<td>4.22</td>
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<td>2.29</td>
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<tr>
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<tr>
<td>Learn something new</td>
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<td>77</td>
<td>4.37</td>
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</tr>
</tbody>
</table>

* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

Table 4. T-tests for pre- and post-program scores by program benefits

Hypothesis Testing
Prior to testing the hypotheses, several comparisons were made between the control and experimental groups. It was expected that passengers would be similar on their demographic profiles. A total of six tests were conducted using both parametric and nonparametric statistics. Four t-tests revealed no significant differences between the groups on: age ($t = 0.94; df = 144; p = 0.35$); education level ($t = 0.56; df = 142; p = 0.58$); trips taken ($t = 0.59; df = 147; p = 0.56$) and programs attended ($t = 0.50; df = 144; p = 0.62$). Two Chi-square tests showed no significant differences on gender ($X^2 = 1.98; df = 1; p = 0.16$) and ethnicity ($X^2 = 0.35; df = 2; p = 0.84$). Based on these test results, the two groups were thought to be similar—except for exposure to the interpretive presentation.

The overall mean for interpreter characteristics was non-significant after comparing the treatment group with the control condition ($t = 1.69; df = 1; p = 0.094$). Of the seven items in this category, only professionalism was statistically significant. Although each
score increased from the pre to post-program evaluation, confirmation resulted since virtually all of the tests were non-significant. According to the theory, passengers should have been satisfied with the interpreter characteristics because none of the scores declined. See Table 2.

A significant (positive) disconfirmation was found between the expectation and satisfaction scores of passengers in relation to message quality ($t = 2.52, df = 142; p < 0.05$). According to the results in Table 3, significant differences were found between the two groups on the following items: informative, clear message, hands-on approach, and personally relevant. Scores of the remaining four items increased, but not enough to reach statistical significance. Since individuals scored higher on all items in the post-program evaluation, a level of satisfaction was assumed.

Lastly, a positive disconfirmation was found between the two groups in relation to program benefits ($t = 3.65, df = 142; p < 0.05$). According to the results in Table 4, five out of six items were significantly different after comparing the pre- and post-program scores. These items included: promote learning, meet people, spend time with others, have fun, and escape boredom. The only item that failed to reach the criterion of significance was, “to learn something new.” As compared with the control groups, the treatment conditions revealed that a majority of passengers felt very satisfied with the benefits derived from attendance.

Discussion & Conclusions
The NPS offers interpretive programming on selected Amtrak routes as a way of enhancing the travel experience for train passengers. Although not stated directly, visitor satisfaction is an important component of this value-added management strategy. Anecdotal evidence suggested that passengers enjoyed the presentations, but their satisfaction with the program was unknown before this study. According to these results, it appears that the TRP has achieved its overarching goal. Passengers in the treatment condition scored higher on every dependent variable than individuals in the control group. Many, but not all, of these differences were significant at the 0.05 alpha level. Future research should examine visitor satisfaction on trains in other areas of the country.

Generalizations should be made with caution since a quasi-experimental design was used in this study. Threats to internal validity increase when conducting research in field-based settings, despite attempts to control the number of rival hypotheses. Since passengers got on and off the train at different times, this variable could not be prevented or controlled. Therefore, changes in the dependent variables are implied, but not actually measured. The main argument against using independent samples in experiments is the potential inequality of subjects before administering the treatment. Locating a similar control group can diffuse this criticism. Treatment and control groups were thought to be similar (before the interpretive presentation), because six tests comparing their demographic information were non-significant. Several interpreters delivered the same presentation. Undoubtedly, this source of error affected the experiment. Although interpreters received the same amount of training, there was no guarantee that the questionnaires were administered in the same way. However, it was impossible for the same person to conduct all the evaluations.
Managerial Implications
Results of this study may have some important managerial implications for Amtrak and the NPS. Through participation in the TRP, passengers had the opportunity to learn about the cultural and natural heritage on selected train routes. For the NPS, this form of education is a unique opportunity to interact with many people who are not traditional park visitors. However, it does not appear that education was a primary benefit for those attending the presentation, despite the fact that the programs were informative. Although the item “to learn something new” showed no significant improvement, passengers believed that the interpretive program would promote learning for kids. Altruistic education may explain this finding.

Having fun and promoting socialization seemed to be better reasons for participation. This result reinforces the need for interactive participation and hands-on learning, something that is ideally suited for young families. However, the NPS should consider creating a “pocket-sized” multimedia program (DVD) or podcast for those not wanting a fun/social experience, but who are still interested in the topic. This strategy might reach a different audience. To maximize its effort, the NPS should serve as clearinghouse of tourism information and have literature on various destinations within the region—available upon request. Since the presentations were enjoyable, passengers are likely to tell others about their experience. Word-of-mouth communication is some of the best advertising for the TRP because it promotes a positive image of the NPS and Amtrak.

Nearly two-thirds of Amtrak’s ridership consisted of “new” passengers, yet only a few of them (about 10%) knew about the presentations before their travel experience. Advertising is a logical solution to address this issue, a suggestion made by numerous individuals on the questionnaire. If publicity occurred (from Amtrak and the NPS), then it would increase awareness of the TRP and possibly stimulate passenger interest. However, one consequence of advertising is fulfilling expectations. If expectations are high initially, then promotion may increase anticipation even more. Since the TRP relies largely on a volunteer workforce, programs cannot be guaranteed. A program cancelled at the last minute due to an emergency situation might be disappointing for passengers. This issue should be weighed carefully before advertising options are implemented.

Research Implications
The response rate for this study (approximately 97%) was very high. There are several explanations for this finding. First, it was a simple request and it only took a few minutes to complete the questionnaire. Participation was anonymous. Passengers were told about the importance of the study and may have felt that their opinions were valued by Amtrak and the NPS. However, the small group size and “captive” nature of the audience may have made refusals somewhat difficult—psychologically speaking.

Train passengers expressed a high degree of satisfaction with the presentation, including interpreter characteristics, message quality and program benefits (> 4.37 using a standard five-point rating scale). Since none of the individual items was rated below $m=4.0$, the NPS and Amtrak should be pleased with this finding. Although it is common for visitors to report high levels of satisfaction with an activity or service (Manning, 1999), this result was unexpected. One explanation for this phenomenon is rooted in expectancy theory (Fishbein & Ajzen, 1975). For many people, the act of participation either confirms or rejects their reasons for involvement. If benefits were not obtained from participation, then attrition is
likely. Perhaps some individuals got bored and left the presentation. Conversely, if individuals completed the program, then it is reasonable to assume that some benefits were obtained. It is likely that both situations occurred in this study.

If visitor surveys only examine outcomes, then the actual benefits of participation cannot be determined. Expectations are needed to serve as an anchor. In other words, outcomes minus expectations equal change. Train passengers had high expectations about the interpretive program. All three domains had scores above 4.03 and each individual item yielded a score of 3.49 or greater. This result was surprising because the presentation was unadvertised and it was free. Actually, the cost of admission was included in the ticket price. Conventional wisdom suggests that expectations are lower for free goods and services than those having a fee. However, Morgan et al. (2003) found that the expectations of self-guided vs. naturalist-led canoeists were the same, despite the fact that each group paid different amounts of money for a similar experience.

If expectations about a product or service are high initially, then significant movement is unlikely because there is little room for improvement. This is an artificial constraint due to the nature of using a closed-ended rating scale. The overall mean for interpreter characteristics was not significant when comparing the control and treatment groups. Although the scores improved, a “low-ceiling” effect may have prevented this relationship from reaching significance. The use of different interpreters to deliver the same presentation probably confounded this result because many of these items refer to personal attributes (i.e., knowledgeable, enthusiastic, asked questions).

**Conclusion**

In this study, passenger satisfaction was measured by comparing the expectations and outcomes of interpretive programs on two Amtrak trains in the Midwest. Despite some difficulties of using a quasi-experimental design in a field-based setting, the expectancy discrepancy theory seemed to be well-suited for interpretive evaluation. Perhaps the reluctance to use this theory is due to its reliance on a customer orientation. However, this might change in the near future as the number of fee-based programs and services increases. Other studies might address this issue.

**References**


National Park Service (NPS) (2002). Trails and rails national expansion plan.


Abstract
A principal function of heritage interpretation should be to link people and places in order to conserve those places. The motive to conserve does not arise only from within the interpretation field. Due to increasing urgency of biological and cultural heritage loss, the wider resource management field requires participation of all conservation-related tools, interpretation included. Any conceptual model concerned with integrating interpretation into conservation programs, then, must explain how interpretation’s central elements of place meanings and audiences directly contribute to conservation. This paper, then, presents a conceptual interpretive planning model that involves audiences in place conservation by leveraging culturally constructed place meanings (in an interpretive framework) to promote desirable actions that meet conservation objectives found in a place’s policy framework. It further describes how interpretive planning can facilitate people’s natural process of constructing meaning, that when combined with appropriate place-based cultural narratives, interpretive media, and conservation knowledge, can result in audiences’ increased likelihood to participate in conservation.

Keywords
heritage interpretation, conservation, memes, interpretive planning, meaning, culture, systems thinking, program design

Introduction
The interpretation field’s most famous advocate is Freeman Tilden (1957) who, in his landmark book, *Interpreting Our Heritage*, stated the purpose of interpretation:
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).

The U.S. National Park Service (2003) has echoed this sentiment time and again. For example, its Interpretive Development Program “creates the opportunity for audiences to ascribe meanings to resources, leading to concern for the protection of the resource. This revelation is the seed of resource stewardship. This is the goal of interpretation, not simply information or facts” (p. 2).

It is clear that the interpretation literature and general interpretive discourse value stewardship highly among the purposes to which interpreters put their craft. The imperative to steward and conserve valued heritage, however, does not emanate only from within the interpretation field. The wider field of resource management also requires the participation of interpretation as well as all conservation-related tools.

Urgency of heritage loss requires this participation. In the case of natural resources, the first sentences from the Millennium Ecosystem Assessment Board (2006) statement warn that, “At the heart of this assessment is a stark warning. Human activity is putting such strain on the natural functions of Earth that the ability of the planet’s ecosystems to sustain future generations can no longer be taken for granted” (p. 5).

Despite many local conservation successes, global biodiversity loss continues at an increasing rate (Balmford, et al., 2003; Jenkins, et al., 2003). Of the many causes of biodiversity loss, habitat destruction continues to be the principal driver (IUCN, 2004). Because of this urgency, donors, conservation groups, and the public demand increased accountability of conservationists to demonstrate conservation success (Salafsky, et al., 2002). Foundations, for example, require more rigorous project evaluation for funding, and new organizations, such as Foundations of Success (FOS), strive to improve conservation practice. FOS’s (2008) vision calls for “an engaged conservation community working in a collaborative, transparent, and respectful manner, with the knowledge that the approaches and interventions it is using are likely to achieve measurable long-term success.”

Another related effort is the recent establishment of the Conservation Measures Partnership (2008), a consortium of the largest international conservation organizations committed to improving conservation practice throughout the field.

While these examples refer to natural heritage, the same can be said of cultural heritage. The first sentence of the Convention Concerning the Protection of the World Cultural and Natural Heritage (UNESCO, 1972) notes “that the cultural heritage and the natural heritage are increasingly threatened with destruction not only by the traditional causes of decay, but also by changing social and economic conditions which aggravate the situation with even more formidable phenomena of damage or destruction.”

These efforts indicate a growing need for conservation tools to produce more measurable and significant results, ones that can be audited by practices accepted across the conser-

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1As per Tilden (1957) and UNESCO’s World Heritage Center (see http://whc.unesco.org/en/about/), this paper uses the term “heritage” to refer to all valued natural and cultural resources. Furthermore, herein “stewardship” and “management” are synonymous.
vation field. Tools that can be used for conservation of natural and cultural heritage, then, should not operate in isolation, but should be integrated into the wider resource management and conservation fields. Heritage interpretation is no exception, even though at times, interpretation practice may not meet its rhetorical allegiance to stewardship and conservation. Kohl (2005) argues this point based on three kinds of evidence.

1. Over three years, only 12 of 275 concurrent sessions at the National Association for Interpretation annual workshops had titles containing keywords relating to conservation, preservation, stewardship, or management (two by Kohl).

2. The Journal of Interpretation Research (Brown & Lee, 2003) published the “Special Issue: Bibliography of Interpretive Resources.” Of the nearly 2,400 references, only 32 had titles containing one of these keywords.

3. Of the National Association for Interpretation’s certification library package containing six critical books on interpretation, none offered a chapter dedicated to conservation, stewardship, or preservation.

Perhaps a principal message from organizations dedicated to improving conservation practice is that most tools used for conservation have potential to increase their impact if designed and managed using a science- and systems-based approach to program management, rather than assuming good outcomes simply result from good intentions. With resources consistently lacking for protected areas, more conflicts over places, and rising extinction rates, greater audience participation can support conservation of special places. To do this requires that managers design objective, measurable connections between places and conservation into their interpretive programs.

Effective Interpretation Depends on Culturally Constructed Place Meanings

One way to integrate interpretation into the wider fields of conservation and resource management is to employ a model that demonstrates how the place meanings that interpreters use as basis of their profession explicitly lead to visitor participation in conservation and resource management. Since, by definition, interpretation works with audiences, any model that discusses integration of interpretation and conservation must focus centrally on audience actions regarding interpreted places.

All aspects of such places perceived by people, both natural and cultural, are culturally constructed by people. Much literature focuses on the role that paradigms (Kuhn, 1962) and worldviews (Naugle, 2002) play in how individuals and societies create meaning and define reality (Goldman, et al., 2001; Greider & Garkovich, 1994). While people in one culture might view their own account of reality as objective and immutable, other groups conceive reality in a wholly different manner. For example, a

The U.S. National Park Service suffers a $4–7 billion maintenance backlog (National Parks Conservation Association, 2004).

One prominent definition of interpretation (National Association for Interpretation, 2008): “Interpretation is a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource” [italics added for emphasis].
Western view of a mountain may focus on its geology and morphology, while an indigenous culture may view the mountain as a living spirit.

Ultimately people create meaning within a culture and the product of their creation modifies that culture. In fact, the very definition of culture may be as varied as its expression. Kroeber and Kluckholm (1952) characterize “culture” based on 164 previous definitions in the literature: “Culture is a product; is historical; includes ideas, patterns, and values; is selective; is learned; is based upon symbols; and is an abstraction from behavior and the products of behavior” (p. 643).

A culture is an interaction of the communal or intersubjective mind of its people and its individual subjects, as illustrated in Figure 1.

Because people constantly create and understand meaning through narratives (Naugle, 2002; May, 1991; McIntyre, 1984)—and some authors argue that the use of narratives to construct meaning is a biological human adaptation (Manhart, 2005; Wilson, 1998)—it follows that messages and themes are encoded in or linked to these narratives (stories) that in turn are associated with a person’s experience, thus making them relevant to that person. This hypothesis is consistent with the theory of symbolic interactionism, which says that people act towards places based on the meanings they ascribe by interacting with those places (Milligan, 1998). It is also consistent with the interaction of semantic and episodic memory (Baddeley, et al., 2001; Tulving, 1972), where semantic memory (facts and ideas) is cross-referenced in episodic memory (experiences and storylines).

Thus, ideas and narratives constitute part of a culture, and the most basic unit of culture is the “meme.” Dawkins (1976) conceived the meme as the cultural counterpart to the gene. He wrote, “Examples of memes are tunes, ideas, catch-phrases, clothes fash-
ions, ways of making pots or of building arches” (p. 192). For the interpreter, meme in the form of idea is most relevant and could include universal values, themes, and other kinds of messages.

Memes, just like genes, are involved in the evolutionary processes of extinction, heredity, cooperation, and competition. The fields of memetics and memography continue to generate many publications (Doyle, 2006; Sterelny, 2006; Blackmore, 2005; Brodie, 2004; Blute, 2005). For this paper, the meme allows the interpretive planning model to clearly trace the route of specific, measurable bits of culture from places all the way to conservation programs for places, in much the same way geneticists track genes in a population and across generations.

Every place constantly undergoes memetic or cultural change (Rochon, 1998), albeit at a much faster rate than genetic change. Consider Auschwitz, the principal Nazi concentration camp during World War II, where six million people died. For the Nazis, place memes described Auschwitz as the flagship camp for the Final Solution, a key stepping stone for domination of the Aryan race. Since World War II, however, the camp has become not only a rallying symbol for Jews never again to succumb to the threat of destruction (another meme), but also a UNESCO-declared World Heritage Site that attracts many tourists (implying still more memes). Throughout the site’s history, memes of Auschwitz have been competing; some have spread across the globe and others have perished in history (Nagorski, 1995; Alvord, 2000).

Humans thus relate to reality through meanings personal and relevant to them (Ham, 1992). Different people, for example, view the attack on the World Trade Center very differently depending on their personal experience. Heritage interpretation, then, is the cultural discipline that has evolved to mediate meanings that place managers wish to promote with meanings diverse audiences find relevant and personal.

New Interpretive Planning Model Shows Dynamics of Linking Audiences and Conservation

If interpretation is to be integrated into the larger realm of resource management and conservation and if place meanings and audience actions are central to that end, then some model of interpretive planning must clarify a) this conceptual connection between place meanings, audience actions, and conservation, and b) how interpretive planning fits into conservation and resource management planning to ensure that interpretation does not operate in isolation of these larger processes.

Interpretive planning currently follows no standard model. Models that do exist tend to focus on connecting visitors with meaning without answering “For what?” beyond cursory mention of higher purpose. There are at least three published models.

• The 5 M Model (Brochu, 2003) briefly discusses that interpretation should serve management goals but offers no models or examples of how this is done. It does describe a project that used interpretation to reduce bear-visitor encounters (see following discussion on the use of interpretation to remediate damage caused by visitors).

• The Master Planning Interpretive Model (Verveka, 1994) does not discuss the connection between interpretation and management and thus offers no models, methods, or examples of how interpretation might be used by managers to this end.
Figure 2: New systems-based conceptual interpretive planning model explicitly links culturally constructed meanings (via memes) with the fulfillment of explicit conservation objectives and reinvestment in interpretive programming.
The U.S. National Park Service Comprehensive Interpretive Planning (National Park Service, 2000; Kohen & Sikoryak, 2005) mentions that interpretation should support management goals, but offers no examples, methods, or models. A section in Kohen and Sikoryak’s manual does encourage planners to ask participants, “What does management expect interpretation to accomplish for the park?”

The field needs a model that explains to managers (including interpretive planners) and frontline interpreters how to make explicit connections between place interpretation and conservation. This way interpreters and planners can design interpretive products and programs that generate direct and applicable benefits to conservation of special places.

Given the lack of an existing model that makes these connections, this paper presents a new systems-based model that focuses on net conservation of places, not just remediating damage caused by visitors. Examples of remediation include the reduction of petrified wood poaching (Widner & Roggenbuck, 2000) and bear-visitor encounters (Lackey & Ham, 2004).

Many kinds of audiences can contribute to a place’s conservation, though tourists tend to be the largest and most commonly cited. External audiences that might contribute resources include school groups, local residents, reporters, dignitaries, scientists, and local governments. Interpretation can also secure support from internal audiences (that is, internal to institutions that manage places) such as staff, membership, boards of directors, contractors, and related agency personnel such as regional and national park services.

The interpretive planning model in Figure 2 is illustrated with causal loop diagramming, a systems thinking tool (Sterman, 2000), in order to show the linkage between audience and conservation via interpretation. These loop diagrams, often precursors to computer models, communicate a system’s structure, composed of relationships and feedbacks responsible for a problem. Each variable can increase or decrease. Each arrow is an assumption or relationship between cause and effect. The system also includes delays that highly influence system behavior (e.g., overshoot and collapse).

Description of the Interpretive Planning Model
Starting in the upper left corner of Figure 2, place qualities are noteworthy traits having some connection to the landscape. Connections include past events such as a historic battle with no physical evidence. In the present, the quality could be the degree of biodiversity or an old, famous tree. A place quality may be in the future as exhibited by a tourist exclamation, “Wow, this is where the World Cup will be played.” All places have associated qualities as well as memes. It is the interaction of memes that determine a place’s identity or sense of place, which varies depending on those relating to the place (e.g., different users such as tourists or place interpreters).

Two simultaneous processes construct memes. First, in any given place, background meaning construction takes place as people (individually and socially) naturally ascribe meaning (Goldman, et al., 2001; Wilson, 1998; Dawkins, 1976) and spread memes among themselves and intergenerationally (Sterelny, 2006). Second, interpreters, writers, film
makers, historians, and others intentionally articulate, clarify, order, create, and diffuse place memes.

Memes then enter the model’s meme processing loop. Here, the more heterogeneous and larger scale the place, the more meme potential that place likely offers. When more memes are available, interpreters have more potential interpretive themes from which to choose. Having more options can increase content quality of an interpretive framework, which is a hierarchically ordered set of narratives and encoded messages often structured with an over-arching theme, sub-themes, storylines, and local stories. While interpreters construct interpretive frameworks from general themes to specific stories (top-down), visitors usually experience them bottom-up; that is, through experiencing local stories, they process ideas higher in the framework as their understanding of a place increases and their appreciation deepens (Zwelling, 2004).

To build an interpretive framework, interpreters prioritize memes, choosing some and discarding others. This process, which occurs both naturally and intentionally, is meme competition, analogous to gene competition.

In the interpretive planning loop, the interpretive framework contributes memes and narratives that interpreters must encode based on a number of factors and then deliver to target audiences through programming. During interpretive programming formulation, interpreters and managers ask themselves which of their audiences are most likely to contribute to their conservation priorities. For example, a fire-fighting program needs shovels, money, and a volunteer fire ecologist. Managers then ask which segments of a place’s audience might be most disposed to contribute to these needs. Once they choose the best match, they must choose the most appropriate memes (about fires, the forest, conservation, etc.) and then choose the interpretive media most likely to produce a highly relevant and engaging visitor experience for this audience type.

Through this experience, the audience’s own ongoing meaning creation process can be guided with meanings supplied by the interpretive program. If successful, the visitor will feel deep emotional involvement with the place and its conservation story. When this happens, and it can happen without the intervention of intentional interpretation, the interpretive program must provide opportunities to channel positive affect into actions pre-planned by place managers that support the fire-fighting program. The provision of opportunities to channel motivation is a social marketing strategy (McKenzie-Mohr & Smith, 1999).

The interpreter knows which actions he desires of the audience and thus, during the experience, can influence beliefs about the efficacy of taking action to improve conservation. According to the Theory of Planned Behavior (Azjen, 1991), such beliefs contribute to positive attitudes about performing the action that leads to an intention to act and, if the interpretive program removes barriers to action (another social marketing strategy), the visitor may perform the desired action.

Others have used interpretation to motivate people to contribute money in more limited contexts. Lindblad Expeditions regularly uses interpretation so that its cruise shipboard passengers to the Galapagos Islands donate to the Galapagos Conservation Fund.

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5There is a relatively large body of research in the recreation resource management literature that measures aspects of sense of place, place attachment, place identity, emotional and functional place attachment, etc. For a broad review see Farnum, et al., 2005.
### Quinta Mazatlan Objectives by 2008

<table>
<thead>
<tr>
<th>Objective</th>
<th>Details</th>
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<tr>
<td>1.1 Host at least three events sponsored by nationally known organizations per year.</td>
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<td>1.2 The number of inquiries by nationally known organizations increases 10% per year.</td>
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<tr>
<td>2.1 Using the U.S. Chamber of Commerce formula for economic impact on a community, Quinta Mazatlan will generate at least $500,000 per year for the local economy.</td>
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<td>3.1 <strong>Contribute at least $30,000 to the World Birding Center Conservation Fund.</strong></td>
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<td>3.2 Meet 100% of all consortium member requirements defined in the World Birding Center bylaws.</td>
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<td>3.3 Install all Cornell Lab of Ornithology kiosks and cameras stipulated in the World Birding Center’s agreement with that institution.</td>
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<td>4.1 <em>At least 3,000 McAllen students will participate in on-site educational programs.</em>*</td>
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<td>4.2 *80% of teachers who bring their classes to participate in Quinta Mazatlan educational programs will rate the program four or five on a five-point satisfaction scale.</td>
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<td>4.3 *25% of all students who participate in on-site educational programs will enroll in the Backyard Habitat Conservation Program, student-level.</td>
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<tr>
<td>5.1 Quinta Mazatlan will fulfill 90% of all tasks formally approved in its annual landscape management plan.</td>
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<tr>
<td>6.1 *25% of all first-time visitors to Quinta Mazatlan who have signed up to receive the newsletter will report that they first visited because of an art show or related art event.</td>
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<td>7.1 Quinta Mazatlan will sign a partnership agreement with Texas Parks and Wildlife Department by the end of 2005.</td>
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<td>7.2 Quinta Mazatlan will have bestowed at least 50 certificates in McAllen for its Backyard Habitat Conservation Program.</td>
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<td>7.3 The Backyard Habitat Conservation Program will have improved at least 200 acres.</td>
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<tr>
<td>8.1 <strong>Quinta Mazatlan will have raised at least 33% (about $133,000) of its annual operating expenditures through hosting events, gift store, and programming.</strong></td>
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<tr>
<td>8.2 <strong>The Quinta Mazatlan volunteer program will have generated at least $200,000 worth of labor (using the Texas Master Naturalist rate of $17.19 per hour).</strong></td>
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Figure 3: Quinta Mazatlan Site Objectives. Asterisk (*) indicates interpretive activity or output-related objectives, while two asterisks (**) are outcome objectives for which interpretive programming is directly intended to support. (Quinta Mazatlan Interpretive Plan, 2006)
(Powell & Ham, in press). Similarly, Cullins (1992) combined interpretation and donation boxes at Mt. St. Helens to fund the park’s interpretation program.

If the interpretation program meets its interpretive objectives, then the perceived value of interpretation in the eyes of management increases. In the short term, this increased perceived value results in a higher rate of investment in interpretation, which improves the quality of interpretive planning (that is, the alignment of product development with both the interpretive and policy frameworks) and the interpretive framework itself (higher skills and investment produce more and higher-quality memes). In the long term, as the return on investment drops below that of potential competing investments, funding priorities shift elsewhere.

Over time the perceived value of interpretation also increases the role of interpretation in policy formulation. This might happen in two ways inside the conservation planning loop. First, place managers might involve interpreters in management and conservation planning. Managers ask interpreters in which ways interpretation might contribute to a variety of management challenges. Second, as managers become more aware of interpretation potential, they look for ways to make interpretation contribute to their objectives.

Through these pathways, interpretation may play a larger role in the place’s policy framework. Such frameworks, written or assumed, are the sum of all pre-existing will or resolve concerning management issues in a place (World Heritage Centre, 2007). A policy framework may include these components:

- Mission/purpose
- Vision
- Principles
- Values
- Significance
- Goals and objectives
- Superior policies and mandates (in government)
- Objectives of stakeholders
- Miscellaneous mandates

Managers could include interpretation within a policy framework through formal objectives, as part of other management functions (protection, public relations, etc.), or through a formal articulation of the connection between place meaning and audiences via interpretation. Figure 3 shows the objectives in the interpretive plan for the Quinta Mazatlan nature and events center in McAllen, Texas. Although the word “interpretation” is not used explicitly, asterisks mark those objectives to which the plan expects interpretive programming to directly contribute.

As interpretation assumes greater responsibility in park operations, more opportunities for visitor actions arise (as managers ask more of interpretation). Ultimately, audiences do more for place conservation.
Interpretation Cross-references Both Policy and Interpretive Frameworks via Audiences

The interpretive planning model does much more than make cursory observations about the connections between interpretation and management. The model indicates that an interpretive strategy cross-references both the policy and interpretive frameworks to determine how best to use a place’s audiences to participate in conservation. Interpretation creates and orders memes, delivers them to audiences based on what actions those audiences can make to support a place’s conservation priorities, and in effect guides visitors (in the minds of visitors) through to actions. To complete the loop in which memes travel through the model (in Figure 2, the meme path is not explicit after “quality of interpretive programming”), interpreters evaluate visitors who have contributed to determine which memes most influenced their decision to act and then use that information to further strengthen interpretive programs. Depending on the results of the evaluation, memes that had an impact on visitor decisions to contribute will be reinforced and pass again through the loop and those that proved ineffective will be modified or dropped (another instance of meme competition).

This model does not imply that interpretation should or could be used alone in bringing audiences to conservation. Often interpretation combines with other conservation strategies. Interpretation must also be seen as part of the conservation program itself in the sense that, no matter how effective interpretation is at generating support, if the actual conservation program that receives that support is poorly designed, little impact will result. Thus, managers must apply effective program design from the earliest interpretive planning all the way through conservation intervention in the field. This way, managers can track the impact of visitor participation on the conservation of place qualities. Effective design implies strong monitoring and evaluation, without which learning and improvement are restricted (Stem, et al., 2005).

Conclusion

Much interpretation today seems more concerned with revelation as an end rather than any specific, pre-determined conservation or management outcomes. Such practitioners must content themselves with the assumption that when audiences understand a place’s story, even its conservation story, they can then determine on their own how best to use their enhanced awareness. For those, on the other hand, convinced of the science-based, objective-outcome approach to designing interpretive programs, this systems-based interpretive planning model may be of assistance. This class of interpretive planning would help interpreters avoid a number of barriers to achieving conservation outcomes.

- Themes are arbitrarily selected on a program-by-program basis, yielding little interpretive program-wide consistency, and little consistency with infrastructure, marketing, and public relations. Such inconsistency likely reduces a program’s ability to motivate audiences to take desired conservation actions.

- Interpretive programming makes few or no specific connections to conservation objectives beyond simple mention.

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6See the classification of conservation actions of the IUCN/Conservation Measures Partnership, 2008.

7For the elements of an effectively designed conservation program, see Margoluis and Salafsky (1998).
Because programs are designed on an individual basis, there is often little synergistic interaction through which programs mutually support conservation objectives or build on each other.

Little evaluation takes place, as there is often no greater place management purpose for the program than visitor satisfaction.

There are few or no concrete conservation-related outputs specified (though learning objectives often exist) such as donations or further audience participation; therefore, programs are not designed to generate outputs. Because managers then do not see interpretation as contributing to their bottom line indicators, interpretation is often one of the first line items to be cut when budgets tighten, or interpreters are excluded from management decision making (Kohl, 2007).

This interpretive planning model provides guidance on two levels of practice that should help minimize these challenges. On the interpretive program design level, frontline interpreters have guidance on what programs need to be created to meet policy framework objectives such as conservation, what should be included in those programs, themes deriving from a formal thematic framework, and outputs consistent with conservation objectives. The framework also leads to much richer evaluation, well beyond simple visitor satisfaction. According to Kirkpatrick’s (1994) four levels of program evaluation, participant satisfaction is the lowest level of measuring program effectiveness.

1. **Reactions.** What are participants’ reactions to the program? Were they satisfied?
2. **Learning.** Beyond satisfaction, what did participants actually learn during the program?
3. **Transfer.** Did participants adopt any behaviors, apply what they learned, or take any actions as a result of the program?
4. **Results.** Did any concrete results come from their actions as a result of the program?

When interpretive programming is based on the intersection of the policy and interpretive frameworks, and is designed with objectives that contribute outcomes that support conservation objectives, then all four levels become relevant. As always, visitor satisfaction is important in refining design and effectiveness of interpretive content and delivery (called “quality of visitor experience” in the model). Now, what they learn and how they are affected by the presentation are important in predisposing them to act (“visitor motivation to act”). Then, visitors must act in predefined ways (“visitor actions desired by managers”) to generate predetermined outcomes necessary to support conservation or other management objectives (“fulfillment of conservation objectives”).

The interpretive planning model also guides managers, including interpretive planners and frontline supervisors. If managers see interpretation as a tool to meet conservation objectives, they can create an interpretive framework that focuses on site features relevant to conservation. They then can tie interpretation directly to objectives in their policy framework and mandate that programming generate outcomes that will help meet conservation objectives. Similarly, they understand what needs to be evaluated (for example, tracking memes or ideas that most dispose visitors to participate in site conservation) and they understand the cyclic effect that improved interpretation leads to better conservation, which
leads to more interpretation investment and better returns. In short, they can now manage a holistic view of the interpretation tool in management activities.

Given that this paper presents a conceptual model and not a case study, further research should focus on model application in real places. Such research could focus on the following: manager perceptions of the role of interpretation in resource management before and after model application, processes of meme construction in an interpretive context, tracing memes through the model system, linking proposed conservation objectives in interpretation programs with actual outcomes, factors that contribute to investment levels in interpretive programs, correlation between participation of interpreters in place management decision-making and conservation actions taken as a result of interpretive programming, and nature of cross-referencing of interpretive and policy frameworks.

**A Greater Future for Interpretation?**

Finally, in addition to the guidance that the model offers both frontline interpreters and site managers, its emphasis on the cultural construction of meaning hints at a greater potential for heritage interpretation. Because worldviews or paradigms guide people’s construction of meaning, and interpretation can mediate that process with respect to specific objects such as places, interpretation could very well have even greater influence on how people construct reality. As many environmentalists argue that current paradigms must change in order to escape today’s global environmental crisis, interpretation along with other communication approaches could play important roles in that change process (Kohl, 2003) before not only individual places are threatened, but civilization itself.

**References**


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**Acknowledgments**

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IN MY OPINION
I read with interest the article by Levi Novey (Novey, 2008) in Volume 13, Number 1 of the Journal, in which he identifies several problems with interpretation and offers several potential solutions to address those problems. The “problems” and “solutions” cited are not new—and I believe that they proceed from faulty premises that would profit from a reply. After 30 years in the game, here are my thoughts.

Novey cites “Problem #1” as the name “interpretation” that we apply to our craft. Despite the long, agonizing history of our struggles with the use of this term, in my opinion this is an empty argument. Novey states that “interpretation” fails “the mom test.” I would argue that “neurophysiology” fails the mom test too. That doesn’t mean that neurophysiology isn’t a real discipline, with real practitioners who do real work—important work. To the public, we are “rangers” or “guides” or “naturalists” or “historians.” They seem to have an inherent sense of who we are in those terms, and I see no need to disabuse them.

Within the profession, most of us routinely refer to ourselves as engaged in “interpretation and education.” Though we may argue about our motives within the profession (more below), I think we all have a pretty good notion of who we are and what we do.

No, the only audience that really needs to get comfortable with “interpretation” is our co-workers in management, administration, law enforcement, resource management, and facility management. And honestly, I don’t think they’ll suddenly respect us more if we change our name. I think they’ll come to better respect us if they truly understand what we do. And to accomplish that, we have to be able to clearly state what we do—and why it’s important—in terms that those folks will understand. Despite Novey’s discomfort with the work of David Larsen, and the NPS’s Interpretive Development Program, I think this work has done much to help us concisely and coherently answer those questions in modern language.

Mr. Novey cites several references to note the diverse
ways practitioners have defined “interpretation.” But he does so in an attempt to demon-
strate that the term is not useful because it is not uniformly unambiguous to the general
public. I don’t think that’s what the cited authors meant at all. In fact, a few sentences
beyond the quote he cites from Beck and Cable (Beck & Cable, 2002, p.7) those authors go
on to say: “Part of the attraction of interpretation is its mystery. There is something unfath-
omable about it. Like religion, there is paradox, but that only lends itself to the power
inherent in interpretation. If you could clarify it precisely, it would lose some of its power.”

This brings us to the second “problem” for Mr. Novey—what he states as a “damaging
and powerful shift toward a constructivist orientation” in interpretation. By this he means
the disturbing notion that people who visit heritage resources make up their own minds
about what those resources mean to them. In my humble opinion, if there is a damaging
problem in interpretation, it is the idea that, as interpreters, we know the truth, the public
doesn’t, and our job is to make them understand that they are wrong and we are right. This
is entirely consistent with his claim that interpretation is really public relations—and that
our job is to “win over” the public to “our way” of thinking about heritage so that the public
will love us, do what we say, and give us money. If there is a mind-set that fully validates the
accusation (not infrequently heard) that interpreters are arrogant elitists, surely this is it.

I believe that most of us in the profession really do feel that our job is to provide
opportunities for people to discover and explore our shared natural and cultural heritage—
on their own terms. And I definitely believe that people make up their own minds about
what things mean to them—despite the efforts of interpreters or others who are sure that
they are “right.” Mr. Novey tells us that there is nothing new in communication—and that
interpreters are deluding themselves if they don’t realize that everything is an advertise-
ment, a commercial. Well, in a way, perhaps he’s right.

We all engage in public relations work: informing the public about what management
does and why—just as we all have a role in providing orientation and safety information to
visitors. We often encounter people who don’t agree with management decisions, and we are
obliged to respect that while clearly explaining why those decisions were made in an honest,
open way. But interpretation sensu strictu is more than that.

I have thought much over the years about whether interpretation is about convincing
people of something—and if so, what? I think most of us will agree that the vast majority of
communication is persuasive. Maybe the real question to ask is, “Just what is it that we are
trying to persuade people to do or feel or believe?”

In the public realm, heritage interpretation must always be based on the most current,
sound, juried scholarship. It must be presented as such, and not argued. In my experience,
no interpreter I have seen has ever made a visitor change his or her mind about any resource
meaning. Certainly many have provided new information, presented perspectives about
what that information might mean, and invited visitors to learn more and think about it.
But made them change their mind? I think not—no matter how hard you hit them over the
head with “facts.”

For public employees at any level of government, it is simply unethical to base inter-
pretation on personal or political preference. Those of us who feel compelled to pursue a career
in issue advocacy (a noble undertaking, but not interpretation) should consider working for
a non-governmental conservation organization (of which there are many) set up for
precisely this work.

But as a National Park Service interpreter, my job isn’t to convince anyone that wolves
are good and sheep are bad—or that sheep are good and wolves are bad. My job isn’t to argue that that rock is more than 200 million years old—or less than 6,000 years old. My job is to encourage folks to explore, investigate, discover, think, wonder, and figure it out for themselves—not use my public position as a bully pulpit. If the purpose of interpretation is to convince people, I think it’s to convince them that the world and all of us who inhabit it are more complex, subtle, mysterious, and meaningful than any one of us can ever fully understand and appreciate. And that no matter how wise we think we are, we all still have a lot to learn.

In the “Concluding Thoughts” of our publication: Interp Guide: The Philosophy and Practice of Connecting People to Heritage (Kohen & Sikoryak, 2005, p.58), Richard Kohen and I state:

As learner, teacher, guide, caretaker, and public servant, the interpreter occupies a unique and valuable niche in modern society. Like the bard, sage, muse, and court jester of elder days, the interpreter uses storytelling to provoke thoughtful introspection and enhance enjoyment while carefully respecting individual perspective and independence.

That can often be a stern test of character. The degree to which most interpreters are emotionally and intellectually invested in the heritage resources they interpret can lead to impatience, overzealousness, and arrogance vis-à-vis the visiting public. It’s all too easy for the interpreter to conclude that he or she knows best. We must constantly be aware of our own weaknesses and biases—and of the fact that people invariably decide for themselves what heritage resources mean to them. We must trust that an honest, professional, diverse, and sound presentation of ideas and perspectives will lead visitors to find value in heritage—and that once heritage is valued, it will be cherished and protected.

I still hold that to be true. I believe that if we claim and hold that high ground, and can articulate that vision, that we will also solve Mr. Novey’s third “problem,” not enough career opportunities for interpreters. If we are seen as those who connect people’s lives to enduring meaning, I think there will be plenty of work for us—whatever we call ourselves.

References


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Abstract
This research is an evaluation of a Headwaters Institute seminar. The Headwaters Institute is a non-profit organization whose mission is to provide education to professional river guides in order to encourage and empower guides to act as environmental interpreters. The ultimate goal of the institute is to inspire the clients of these river guides to care for and connect with the river environments. Using perceived specific teaching and motivation efficacy as outcome measures, pre- and post-tests indicate a significant increase in self-efficacy regardless of age, gender, or length of time in the profession. This research indicates that the seminars empower professional river guides to act as environmental interpreters.

Keywords
interpretation, river guides, Headwaters Institute, teaching efficacy, motivation efficacy, perceived self-efficacy

Context
The Headwaters Institute is a non-profit organization with a mission “to provide education that inspires individuals and communities to care for and connect with their watershed” (Hicks, 2006). The Headwaters Institute’s main purpose is to offer seminars throughout the country. These seminars are focused on providing river raft guides with education and support so that they may act not only as guides, but also as environmental interpreters. Since 1996, Headwaters Institute
Seminars have been expanded to train not only river guides, but also sea kayaking and fly-fishing guides as well as other individuals who may have the opportunity to play the role of environmental interpreters to the public. “In putting [these guides] through … educational seminars, the institute hopes to inspire participants to be better interpreters of rivers’ natural and cultural history, which will give their clients a better appreciation of the waterways they float” (Reimers, 1999). However, little information has been obtained regarding how effective the Headwaters Institute seminars have been in achieving this goal.

**Study Purpose**

The purpose of this study was to evaluate the effectiveness of participation in a Headwaters Institute Watershed seminar in increasing attendees’ efficacy perceptions regarding his or her ability to: 1) teach specific information about the environment, and 2) motivate clients to learn about the environment.

**Background**

Research indicates that quality interpretation in recreation and tourism settings can be a key element in whether recreationists understand and appreciate the role of the natural environment in their recreation and their own role in the protection of that environment (Madin & Fenton, 2004; Tubb, 2003; Roggenbuck et al, 1992; Sharpe, 1982). A guide’s self-efficacy concerning his or her ability to convey such information may directly determine the potential outcome of this effort.

While talent, skill, and physical and psychological environment influence direction, performance, and health, it is the individual’s judgment regarding his or her effectiveness (or efficacy) that mediates the influence of the aforementioned factors (Bandura, 1997). Therefore, an individual’s perceived self-efficacy is an indicator of maintenance, effort, and performance of specific behaviors (Bandura, 1997).

Considerable research has investigated the link between perceived self-efficacy and performance (Bandura, 1997; Cevrone, 1989; Oliver & Cronan, 2002). Specifically related to this study, one’s sense of efficacy regarding his or her ability to teach has also been shown to be related to student outcomes (Ross, 1992; Midgley, Feldlaufer, & Eccles, 1989). A teacher with a higher perceived self-efficacy regarding teaching ability is more likely to have higher achieving and more motivated students (Bandura, 1997).

**Methods**

The Headwaters Institute Western North Carolina Watershed Seminar took place May 24, 2007, from 8:00 a.m. to 5:00 p.m. at Camp Rockmont in Black Mountain, North Carolina. The opening session of the seminar, “The State of the French Broad River Basin” was attended by all participants. Each participant could then attend two of the three morning sessions: Basic Birding, Tree Identification, and Fish Ecology and Identification, and two of the three afternoon sessions: Stream Entomology, Geology, and Wildflower Identification.

Upon arrival, each participant filled out a pre-test survey. At the end of their last class, each participant filled out an identical post-test survey, both returned on-site. The survey was based on the Science Teaching Efficacy Belief instrument (Riggs & Knocks, 1990), and followed the methods described in Bandura’s (2001) *Guide for Constructing Efficacy Scales*. One of Bandura’s main points in this guide is his suggestion not to use an “all-purpose” instrument that claims to measure self-efficacy. Instead, the questions should be activity-
specific, for example, the specific activity of teaching about birds of the area. Bandura also suggests that questions be formatted in a Lykert-type scale. The survey was constructed of 16 Lykert-type scale perceived teaching self-efficacy items. Eight of these questions were regarding perceptions of one’s ability to motivate and inspire others to learn. This was termed motivation efficacy. An example of a motivation efficacy question is: “How much can you motivate a client/student who shows little interest in learning about the watershed?” The other eight questions on the survey were regarding perceptions of one’s ability to teach specific content. This was termed specific content efficacy. An example of a specific content efficacy question is: “How confident are you in your ability to teach your clients/students about the birds of your area?” The survey also included basic demographic questions, including age, gender, type of position (job), and length of time in that position. The scale was found to be reliable, with a Cronbach’s alpha coefficient of 0.87.

Results
A total of 30 individuals attended the Western North Carolina Watershed Seminar. Eighteen participants were female, 12 were male. All attendees participated in the study. The average age of participants was 30, with a range from 18 to 63. The participants fell into three basic categories of job type: raft guides (30%), fishing guides (6.7%), and environmental educators (63.3%). Paired samples t-tests were run to determine if there were significant differences between pre- and post-test specific content efficacy, motivation efficacy, and a combination of the two, termed “total teaching efficacy.” Mean scores for all attendees on the pre-test surveys indicated at least a midpoint score of “somewhat confident” score with regards to motivating efficacy. All three comparisons were found to be significant ($p<.005$), indicating an increase in self-efficacy as a result of the seminar training. Neither age, gender, position, nor length of time in the field were found to be significant predictors of total teaching efficacy or motivation efficacy. However, a significant difference was found ($p=.007$) between male and female post-test specific content efficacy. Further investigation revealed that, while both genders showed significant increases in specific content efficacy, men came into the seminar with a higher (though not significantly so) specific content efficacy than women, and on average, males had significantly higher specific content post-teaching scores than women did.

Conclusions
In the current study, mean scores for all attendees on the pre-test surveys indicated at least a midpoint score of “somewhat confident” score with regards to motivating efficacy. However, pre-test scores for specific content efficacy were higher (though not significantly so) for male participants than female participants. All mean scores then increased by statistically significant measures following the seminar training, with the scores for the men resulting in a significantly higher specific teaching efficacy score than the women. This suggests that regardless of confidence level coming in, participation in the seminar was still effective in increasing self-efficacy. In that the people who attended the seminar did so voluntarily and so were an already interested/self-selected group of participants, it makes sense that they would likely be motivated to learn. Regardless of how confident they were about their ability to teach and motivate, most were still able to benefit from attendance and increase this confidence level related to information presented. This may reflect a variety of ways in which the seminar could have an impact on self-efficacy. For example, either the seminar
introduced new and previously unknown information to participants, presented new and engaging ways to teach or present the information to future clients, or perhaps it was the very factor of being engaged in and simply attending the seminar with like minded professionals that lead to the increased scores. The significant difference between male and female post-test specific content self-efficacy scores deserves further investigation.

For future participants not attending voluntarily (i.e., attendance is required as part of staff training), participation may still have a similar impact. However, non-volunteers might come into the training with less motivation to learn as well as with a lower initial self-efficacy concerning their knowledge base and ability to motivate. Therefore, coordinators may consider gearing the content to better meet participants at their level, so that they would have an opportunity for several small successes, creating greater probability for efficacy enhancement. This may include not only offering sessions that teach specific information, but also offering sessions that focus on facilitation and teaching skills that are appropriate in the guide/client circumstance.

**Implications**

These results indicate that participation in the Western North Carolina Watershed Seminar, regardless of age, gender, job type, or length of time in the field, did indeed increase participants teaching efficacy perceptions. Research shows that interpretation programs not only add to visitor enjoyment, but also help protect the very resources upon which that recreation is based (Madin & Fenton, 2004; Tubb, 2003; Roggenbuck et al, 1992; Sharpe, 1982). Previous research has also indicated that river guides may be an important, and potentially underused, source through which environmental interpretation can take place (Bange, 1984; Roggenbuck, Williams, & Bobinski 1992).

In the effort to increase knowledge and awareness of our ecosystems and watersheds, the Headwaters Institute has developed a system that supports a continent-wide network of educators by focusing its efforts on professional guides that have the opportunity to act as ambassadors and spread information. The results of this study indicate that this first step, the empowering of these ambassadors, is one that is being accomplished. Subsequent research should explore the next step in the Headwaters Institute objectives, the impact that seminar attendees have on their client’s experience of the river and attitudes towards conservation.

**References**


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The purposes of the Journal of Interpretation Research are to communicate original empirical research dealing with heritage interpretation and to provide a forum for scholarly discourse about issues facing the profession of interpretation. The Journal strives to link research with practice. The Journal of Interpretation Research is published by the National Association for Interpretation, the preeminent professional association representing the heritage interpretation profession.

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