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The publication of this issue of the Journal of Interpretation Research marks a special point in time for this publication. As most of the subscribers and readers of the Journal are aware, several of the previous issues of the Journal, including this issue, have been produced on a delayed publication schedule. This occurred not for laziness on the part of the editors or the publisher, nor due to a lack of commitment to produce the publication, but rather due to the absolute obligation for producing a journal of the highest quality by the National Association for Interpretation. Since the publication of the first volume in 1996, this publication has never veered from the standards first established to provide a forum for academic and scholarly works on behalf of heritage interpretation. Sometimes a delay in the publication date was necessary for ensuring the quality of the materials contained in the Journal. The publication of this issue may mark the end of the delayed publication for the Journal of Interpretation Research.

In 1996, during the first year of my tenure as the president for the National Association for Interpretation and the publisher of the Journal, I was able to produce the first issue of the new publication dedicated to promoting and reporting scholarly works in the area of interpretation. The development of a peer-reviewed scientific journal was the highest of my priorities as president. Having the renowned Dr. Ted Cable accept the responsibilities of being the first editor was beyond any expectation. Dr. Cable established the editorial policies and procedures that ensured the establishment of a high-quality publication representing the best in interpretation research. The uncompromising focus on the quality of the publication can be directly traced to Dr. Cable. When Dr. Cable stepped down from the editorship, I had completed my run as president and accepted the role of journal editor. Throughout the first eight years of the publication we faced many challenges and had great successes. Our dedication and focus on providing the highest quality of research and professional discourse never frayed.

With the start of the year 2004, I have requested that Dr. Carolyn Ward assume the editorship of the Journal of Interpretation Research. Under her highly capable leadership, the Journal will not only maintain its commitment to quality, but promises to excel in innovative and creative endeavors. Additionally, the current rate of quality
manuscripts submitted to the Journal should ensure the re-establishment of a regular publication schedule. Look for new and expanded features under the able leadership of Dr. Ward.

The Journal of Interpretation Research continues to be the authoritative voice for scholarly and academic development in heritage interpretation. It has been my absolute pleasure to have a chance to watch the creation, establishment, and growth of this important publication. I await for the next developmental phase of the publication with great anticipation.

—CMB
Abstract
In recent years there has been concern expressed for the need to strengthen and broaden the theoretical foundations of interpretation research and practice. Drawing on interactionist theory and sociological and spatial perspectives, the paper seeks to address this concern by proposing an alternative approach to environmental interpretation that moves us towards the construction of a person-centered sociology of interpretation. A central element in this conceptualization involves moving the focus on to the interpretive experience and the interrelation between interpretive spaces, the selves, and “other” as elements of the interpretive experience. It is argued that the current practice of interpretation is increasingly used as a tool more for controlling the behavior of the visitor and their impacts and less as a medium that facilitates and promotes interaction and exchange between the visitor, the host community, and nature. Thus there is a need to re-examine and re-position the concept of environmental interpretation. It is suggested that the approach put forth in this paper can provide interpreters and park agencies with a theoretically expanded and more holistic approach to interpretation practice.

Keywords
interpretation, tourist, interactionist theory, interpretive space, self, other

Introduction
This paper examines the concept of interpretation within the context of the connections between nature and the experiences of those who interact with nature through tourism and recreation. As an extension of this examination the paper
addresses the vexing issue of approaches to environmental interpretation and suggests that new alternative approaches are necessary if interpretation in the future is to achieve goals that will have an impact on and influence tourists. We argue that traditional approaches to interpretation, based more often than not on theoretical frameworks relating to attitudes, intentions, and behavior only, are too narrowly conceptualized and operationalized. Indeed, one of the founding principles of interpretation centers on its stated role in promoting long-term change in the actions and attitudes of users towards those more appropriate with a conservation ethic. However a growing body of research literature appears to be giving mixed signals as to the ability of current interpretive practice to change the attitudes and behaviors of audiences (Minton & Rose, 1997; Roberts & Bacon, 1997; Schlegelmilch, 1996).

To date, the theorizing of interpretation has drawn insights primarily from psychological and learning theories with comparatively little attempt among scholars and practitioners at understanding the concept of interpretation from other theoretical perspectives. At the same time, a dilemma for interpretive practice is emerging where it is seen to be, and is increasingly used as, a tool more for controlling the behavior of the visitor/tourist and their impacts and less as a medium that facilitates and promotes interaction and exchange between the tourist, the host community, and nature. Thus there is a need to re-examine and re-position the concept of environmental interpretation. Indeed, Ballantyne (1998) and Uzzell (1998) call for interpretation to be built upon an extended theoretical base. In response, the aim of this paper is to build a conceptual picture of the relationship between interpretive experience and “self” from sociological, interactionist and spatial perspectives. The focus of the paper is on the selves involved in the interpretive experience, examined from a person-centered sociological perspective.

It is our intention to move the focus on to the interpretive experience and the inter-relation between interpretive spaces and the selves as elements of the interpretive experience. Of particular importance to our conceptualization of the interpretive experience is the notion of enlarging the self by empowering the tourist to interact within the interpretive space with the ‘other’ of nature and host; thereby enabling the tourist to be an active participant in the construction and meaning-making of their own personal interpretive experiences. Each individual meaning is constructed according to the tourist’s own cultural and social background, the purpose of the visit, their companions, pre-conceived and observed values of the host culture, the marketing images of the destination and above all, the relationships of power between the tourist and host cultures and within the host culture (Wearing, 2002).

We contend that by recognizing that the interpretive experience is based on interactions people have within the elements of the interpretive space visited, it is possible to provide more a transformational interpretive experience. By understanding the value of the interpretive experience to the tourist from their perspective, it could mean that interpreters and associated agencies will need to give greater emphasis to the on-site interactions and the importance of them to the tourist, and develop strategies around these ideas. This can allow an alternative look at how interpreters and associated agencies structure interpretation and may provide directions for policy in the future.

The paper begins by examining sociological perspectives of the tourist experience drawing on literature particularly focused on interactionist theory. We have attempted to position the more optimistic perspectives of microsocial interactionist ideas on the self
and poststructuralist ideas on capillary power and resistance within the constraints of the wider power structures of society which lead us to the need to place interpretation in a wider theoretical framework than what has been the case so far. MacCannell (1976: 23-29) accords to the tourism experience a considerable degree of complexity in his analysis of it as a subclass of cultural experience, thus opening it to the intellectual and ideological debates of sociology. It is, therefore, essential in the examination of interpretive tourism experiences to analyze their social construction in order to understand the complexities of the experience and its relationship to culture.

**Sociological perspectives of the tourist**

Two main themes concerning the self of the tourist have emerged to date from the sociological analysis of tourism (see Wearing, 2001). First, there has been an emphasis on tourism as a means of escape from everyday life – albeit temporarily (e.g. Cohen & Taylor, 1976; Rojek, 1993). Considerable debate has centered on the authenticity or otherwise of the tourist experience (cf. Cohen, 1988; Krippendorf, 1984; MacCannell, 1976), which has focused attention on the attractions of the tourist destination. Hence the destination as place is objectified; a specific geographical site presented to tourists for their gaze (Urry 1990). The manner of presentation became all important and its authenticity or otherwise the focus of analysis. Objects of the gaze were categorized in terms of romantic/collective, historical/modern, and authentic/inauthentic (Urry, 1990: 135).

According to MacCannell (1976), tourism occurs because people are searching for authenticity in their travel experiences in response to a lack of personal meaning in their everyday existence. MacCannell likens the tourist to a pilgrim seeking the truth, and using Goffman’s (1971) notion of the front-stage/backstage dichotomy, argues that although tourists are seeking the “authentic” backstage, such a quest is often thwarted by the tourism industry constructing a highly regulated front-stage. He argues that the attractions which form the basis of the sights, and their importance, are symbolized for the tourist by markers. In this way, these markers serve to mediate or interpret the sights for tourists by the tourism industry. MacCannell’s theorizing evolved in response to Boorstin’s (1964) earlier analysis of the modern tourist as a superficial, pleasure seeking hedonist unable to experience reality, and who views contrived and artificial “pseudo-event”.

The conceptualization of the tourist from the perspective of the “tourist gaze” has been debated in tourism literature for some time. One of the major contributors to the development of this notion is sociologist John Urry (1990, 2002). Urry (1990: 1) observes that the tourist gaze is “…socially organized and systematize”. On this point, Wearing (2001: 145) suggests that what is portrayed as seemingly natural is in fact historically constructed through a complex system of social interaction. The gaze of the tourist is mediated by sign construction and signposting. Places are chosen by tourists to be gazed upon as a result of anticipation of pleasures of a different nature to those encountered ordinarily. According to Urry (1990: 3), such anticipation “is constructed and sustained through a variety of non-tourist practices, such as film, TV, literature, magazines, records and videos, which construct and reinforce the gaze”.

As Markwell (2001: 41) makes clear, “tourist-nature interactions are constructed and mediated by the tourism industry and associated agencies – nature within tourism is predominantly experienced through contrived or mediated encounters, with the guided
tour itself a prime source of mediation”. The way in which the tourism industry and public land managers organize and structure the tourist gaze (Urry, 1990, 2002) exemplifies the hegemonic control over the ways by which tourists understand and make meaning out of the environment they see and interact with (Markwell, 2001). Tourists, however, bring with them on their visit their own set of beliefs and ideas about nature. These beliefs and ideas have been strongly influenced by the images and myths created, transmitted, represented, and reinforced through various forms of popular culture.

In weaving the above conceptualizations of tourists and tourism together we can begin to understand more fully some of the limitations such theoretical constructions hold in explaining the tourism experience (see Table 1).

Alternatively, the act of travel has been constructed as a means of self-development and a way to experience the new, broaden the mind, and to return in some way enriched by the experience (e.g. Brown, 1992; Pearce, 1984). Traditional, masculinized perspectives of tourism have objectified the destination as a place, a site which is presented, authentic or otherwise, to the tourist for their gaze. However, the somewhat predominant white, male western writing on tourism is now being re-examined from an interactionist, person-centered perspective which emphasizes the importance of interactions, both personal and cultural, in the tourist experience (cf. Wearing & Wearing, 1996; Wearing & Wearing, 2001). The focus of this approach is on the interaction that occurs within the tourist space or destination; the tourist plays an important part in the construction of the tourism experience and the host is acknowledged as a person in that experience rather than an homogenized “other” (Wearing & Wearing, 1988).

Wearing & Wearing (2001) have argued that the theorization of tourism needs to not only recognize the interrelation of the site and the activities provided for at the tourist destination, but requires a fundamental focus on subjective experience itself.

<table>
<thead>
<tr>
<th>Power</th>
<th>Western Society</th>
<th>Host Society</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Economic resources</td>
<td>Economic dependence</td>
</tr>
<tr>
<td>Culture</td>
<td>Hegemonic control</td>
<td>Hegemonic acquiescence</td>
</tr>
<tr>
<td>Values</td>
<td>Profit</td>
<td>Survival, profit &amp; employment</td>
</tr>
<tr>
<td>Place/Space</td>
<td>Tourist destination, a place, an image</td>
<td>A place on display (home and everyday life)</td>
</tr>
<tr>
<td>People</td>
<td>Tourists as voyeurs</td>
<td>Hosts as servants and objects for observation</td>
</tr>
<tr>
<td>Selves</td>
<td>‘I’, ‘me’ constrained by hegemonic culture – consumes and eliminates ‘others’</td>
<td>Constructed as ‘they’, ‘other’, ‘inferior’ to dominant culture</td>
</tr>
</tbody>
</table>

(after Wearing & Wearing, 1997)
While not being divorced from its sociological contextualization, the involving experience allows for the elaboration upon the role of individual tourists themselves in the active construction of the tourist (and by extension interpretive) experience. The adoption of this view acknowledges the relational complex of the individual, the individual’s social groups, travel experiences, and the interrelating elements that sustain the experience and are incorporated into the selves that the tourist carries abroad and home again.

We can therefore begin to see that tourism as experience, involving complex and often subtle interactions between the tourist, the site, and the host community, problematizes analyses predicated on the conceptualization of the tourist as “wanderer”, “gazer” and “escaper” as is common in the tourism literature (cf. Brown, 1992; Cohen & Taylor, 1976; Pearce, 1984; Rojek, 1993, 1997; Urry, 1990). Wearing & Wearing (2001) contend that as the tour group, the host community, and the natural environment, to varying degrees, are interdependent components of any tourist experience. There is a need to move beyond simplistic typologies towards a more analytically flexible conceptualization that allows for the exploration of the assumptions implicit in the “tourist gaze”, the tourist “destinatio”, the marketing “image”, and the “visit”, in suggesting other modes of analysis that may better account for the significant range and diversity of tourist experiences. Hence, a conceptualization of the selves of tourists which constructs and reconstructs the tourist experience in interaction with significant others, significant reference groups, and the generalized other in the form of cultural values may go some way to exploring the complexity of tourist experiences for both tourists and hosts (Wearing & Wearing, 2001).

Social interaction with the group and community are fundamental elements and contribute to the social exchange (seen as a process) of the experience. Social processes contribute significantly to the development of meanings about the tourism experience. These meanings are derived through social interaction with family and friends and reflect Stryker’s observations about the development of meanings as they affect behavior:

“[In the symbolic interactionist perspective] Behavior is largely governed by the individual’s social definition of the situation, interaction with others in the social milieu, and the self concept [which is] governed to a large extent by others in a social process” (1980: 27).

This reinforces the utility of the interactionist perspective in understanding the observed patterns of behavior. It recognizes the status and significance of others in a social group as a dominant construct, as opposed to research based in psychology and social psychology, which regards the influence of others as peripheral in relation to individual decision-making.

Interactionist theory has long recognized the interplay of the self with its emphasis on the contribution that “significant others” and “significant reference groups” make to one’s sense of self. Yet in both interactionist and environmentalist theory, “self” is prioritized over “other” and there is a clear demarcation between the two: self being seen as the subject and the other as the object. If, through post-colonialist theory, the binary opposition of “self” and “other” is deconstructed so that “self” is no longer prioritized over “other”, and furthermore, eco-centrism is able to be included into our concept of nature, the idea of travel can move to a circumstance where the commodified, individualized,
and self-centered focus is progressed. This allows nature to take on different meaning in
which involvement with the other is a part of travel in nature and not separate from it.

The reconceptualization of the tourist from detached gazer to that of interacting per-
son points to a shift also from tourist destination as place to a more interactive space; a
shift from a focus on the image of the destination to one on its social and cultural values;
from tourism as activity to an open ended process in which the self may be enhanced.

Tourists do more than just visually consume nature; tourism is not confined only to
visual forms of consumption (Franklin & Crang, 2001). Tourists also experience an
attraction or setting bodily through the senses of touch, taste, smell, and sound; tourists
are hence embodied subjects and there is growing interest in theorizing the relationship
between the body and contemporary tourism experiences (see Desmond, 1999; Franklin
& Crang, 2001; Fullagar, 2001; Johnston, 2001; Markwell, 2001; Veijola & Jokinen, 1994).
Whilst sight might be the primary way by which tourists experience places, other sensory
stimuli, such as sounds, touch, and smell also allow the tourist to shape and give mean-
ing to their experiences. Markwell (2001) suggests the way the tourist body is constituted
and how it performs in different tourist (and by extension, interpretive) spaces is influ-
enced by variables such as gender, age, ethnicity, sexuality, and social class.

**Socio-cultural construction of the tourist space**

Pritchard & Morgan (2001) contend that with the permeation of cultural and feminist
geography into tourism research, space and place are increasingly being recognized as
socio-cultural constructions rather than simply as physical locations. The tourist place
provides social spaces for individual experiences related, amongst other things, to leisure
expectations, guest/host relationships, and interactions with community members.
Operations of power between the cultures of the tourist and the host enable hegemonic
constructions of the host’s culture. These constructions position the “otherness” of hosts
as inferior to the tourist’s original culture. The tourist destination then becomes a place
for the voyeuristic gaze of the tourist reducing, at best, the destination culture to an infe-
riorized exoticism. In this model of cultural construction, the difference in culture is per-
ceived as inferior and serves to reinforce the dominant values, usually reinforcing the
capital accumulation logic of Western economies, of the tourists’ original culture. The
discourses of tourist literature and marketing have in many ways implicitly adopted this
top down hegemonic view and need deconstruction and contestation from below, from
the margins and the re-historicized other (see Wearing & Wearing, in press).

Edensor (1998) has argued that contemporary tourist processes produce distinct
forms of tourist space on a global stage, which are commodified in particular ways and
organized and regulated differently. Tourist sites provide a space where political, spiritu-
al, cultural, or national identities can be imagined or expressed with contesting notions
about what they mean articulated by different groups of people (Edensor, 1998).

Destinations are not just places, rather they constitute settings of interaction. Each
tourist has different experiences and social and cultural backgrounds that they bring into
the space, and so have different perceptions and attach different meanings to that space.
The nature of their interaction with elements of the space and others within the space
will also effect their perceptions. We can see then that space in the context of tourism
assumes different forms; space can be social, cultural, geographical, and temporal.
Tourism, interpretation and heritage

Tourism is essentially a modern Western phenomenon the analysis of which has evolved from pre-modernism through to post-modernism. It differs significantly from non-Western and historical forms of travel, being closely related to the emergence of modernity with the concomitant emphasis on economic viability. The growth of tourism as a social phenomenon and the tourist industry as an economic enterprise has been dramatic during the last half of the twentieth century. Tourism has become a major social and economic force in many countries and regions throughout the world.

Tourism is a social activity; it takes its values and meanings from the social, historical, and cultural backgrounds of tourists. Recognition that a tourism experience in nature means different things to different people is essential. Public sector funding from governments can no longer be taken for granted, especially as the number of parks and similar protected areas competing for these limited funds increases. This has meant that parks agencies have had to look to increasing visitor numbers as an alternative way of ensuring adequate levels of funding. With the recognition within parks agencies that tourism brings with it economic benefit, and indeed mounting pressure to conform to demands for economic benefit, national parks and other protected areas are receiving visitation from an increasingly diverse market. Furthermore, the necessary response to community needs and expectations, and the development of partnerships with tourism bodies has further expanded the use of and visitation to national parks.

Increasingly, the local and global spaces of natural and human cultural heritage are being produced, packaged, and managed for human consumption (Jamal & Hill, 2002). Wearing (2001: 142) asserts that, in the main, tourists have been conditioned to accept a structured experience often packaged by large operators with little understanding of the local natural and cultural resources.

There is, however, ample evidence of increasing concern for the natural environment through support for environmental protection in Western liberal democracies. This increasing concern has led to the emergence of “alternative” forms of tourism such as nature-based tourism, adventure tourism, green tourism, special interest tourism, and eco-tourism. These newer forms of tourism have been characterized as alternatives to traditional mass tourism experiences and in most cases are focused on the natural and cultural heritage protected within settings such as national parks, forests, and wilderness. Interest is not held by “lounging by hotel pools or hectic sightseeing schedules” (Collins, 1993: 7), rather these newer types of tourists are wanting to experience new lifestyles and meet people with similar interests to themselves and they want to see their traveling dollars benefiting the local economy and conservation efforts (Eagles, Ballantine & Fennell, 1992). It is easy to understand why increasing numbers of tourists are attracted to natural areas. The protected areas of the world contain some of its most beautiful scenery and outstanding natural landscapes. The natural features of protected areas offer attractions which in many countries have become the cornerstone of tourism activity and development.

Clearly, the growth of interest in nature-based tourism worldwide is not merely another recreational trend, but also reflects a fundamental shift in the way people value wild, natural, or near-natural places. Park management authorities are being challenged by changing expectations for the management of public lands and resources for both current and future generations. Both government and the citizenry are driving the change in expectations and this is reflected in the push for greater accountability and
improvement in management agency performance.

Interpretation is widely considered to be a central component of the tourism product as well as an important management tool. Interpretation has been described as “an activity” (Tilden, 1957), “a communication process” (MacFarlane, 1987), “a management tool” (Sharpe, 1982) and “a process of stimulating and encouraging appreciation” (Carter in Wearing & Neil, 1999). It is a form of learning that embraces the educational concept of communicating natural, physical, cultural, and historical information encompassing philosophy, psychology, educational, and sociology theory to assist in building awareness and developing appropriate attitudes and behaviors. The benefits of interpretation have been widely reported as including the ability to raise awareness, appreciation, and understanding of park values, orient visitors to the facilities and attractions of an area, facilitate change in the attitudes and behaviors of individuals, and enhance visitor satisfaction.

Interpretation and its relationship with conservation and preservation issues has become increasingly sophisticated over time. In its earliest guise, interpretation was concerned with acquainting visitors with features of the park. It later expanded to stress inter-relationships, ecology, and the landscape in general – management issues received greater attention, but with communication focusing primarily on park issues. More recently interpretation has expanded to foster a broader environmental consciousness among park visitors, with a shift from an internal to external perspective. Knudson, Cable & Beck (1995) suggest that the primary ulterior motive of agencies and individual interpreters is to lead people to greater concern and intelligent action to sustain the natural and cultural environment in which people live. Interpretation is important to society as a way of acquainting the population with its life support system – the environment (Beckmann, 1991). It is designed to help tourists broaden their awareness and understanding about the places they visit, thus adding to their tourist experience. In this way, it is recognized that interpretation, if planned carefully and sensitively, can contribute to sustainable tourism development.

One of the increasing criticisms of approaches to interpretation to date is that there has been too much emphasis on the cognitive dimensions of interpretation and not enough on the affective and behavioral domains (Uzzell, 1998; Ballantyne, 1998). In the words of Ballantyne (1998: 81), there has been “little or no attempt to raise awareness of differing attitudes and values towards objects or issues”. Interpreters too willingly assume that visitors will learn as a consequence of reading their signs or information panels; what can be labeled as passive interaction. However, research in heritage settings suggests otherwise. Studies in museum settings, for example, have shown that the most effective exhibits for learning are those which encourage social interaction among visitors (Blud cited in Uzzell, 1998; Tuckey, 1992; Falk & Dierking, 1992).

The continuing trend towards reduced operating budgets in “real terms” for protected area agencies has important implications for on ground interpretive practice. If interpretation is seen just as a controller of visitor impacts and behavior primarily to allow management to offset costs, then such a definition of interpretation becomes too limited. It is possible that there may be fewer on-site staff available thereby reducing levels of personal contact with tourists and visitors. Any large scale replacement by other mediums such as signs, self guided walks, and other audio visual aids, raises the concern that the sharing of information becomes reductive by necessity because of large numbers of users along with the need to be self explanatory and accessible. This means that it is also
reduced to the lowest common denominator of understanding; often this can mean a loss of effectiveness in communicating a message. Additionally whose point of view are interpreters reducing the message to; is it the user’s point of view, the operator/manager’s point of view, or is it the local/host community’s point of view? We would suggest that the current dominant focus on delivery rather than process, (i.e. infrastructure, buildings, and signage rather than ideas like guided tours, etc,) focuses too much on the needs of management and too little on the needs of the visitor/tourist.

**The self/other connection and interpretation**

According to Tilden (1957), an essential role of interpretation is to promote encounters with the real; that is real experiences and objects not the commodified or inauthentic. This recognizes that interpretation should not become a surrogate for the real natural and cultural heritage that attracts tourists. The aim should be for the tourist to be encouraged by elements within the interpretive space to interact with and experience the environment and go beyond the contrived and artificial.

In an interpretive space consideration is given to embodying the interpretive experience. The tourist “body” is therefore considered alongside the “cerebral” self, that which has long been treated by scholars and practitioners as the extent and center of interpretive inquiry. Such an approach has ignored, to its detriment, the role of the body and the ways in which it interacts with elements of the interpretive space. The challenge is therefore presented to interpreters to embody interpretive experiences so that they provide the tourist during their experience with a heightened awareness and stimulation of all their bodily senses. Seeking out the new and unfamiliar and going beyond our daily concept of self is an essential step in developing the self; by this we do not mean changing the self but rather enlarging the self. Forms of tourism such as nature-based, adventure, and eco-tourism may be thought of as providing situations in which tourists are often challenged and tested in a physiological sense.

Natural and cultural settings such as national parks have become places for what Urry (1990, 2002) terms the voyeuristic “gaze” of the visitor/tourist - the interpretation of it is perceived as somehow alien and serves to reinforce the dominant values of park management (the hegemonic culture) rather than a process of experience. Yet one of the goals of interpretation is to provide experiences that allow the self to be enlarged and which enhance interaction with nature. Interpretation must progress to the stage where it incorporates the “other” within its role; for example, ethnic groups and their conceptual views of nature. Making interpretation accessible and meaningful to other less dominant groups in society requires, as Aplin (2002) describes, an effort on the part of interpreters and associated agencies to step outside their own social context and inside someone else’s. Similarly, Driver et al. (1996: 5) observe that “if public land managers are to be responsive to the changing needs and values of an increasingly multicultural citizenry in management planning, they must work toward a fuller understanding of those needs and values.” By understanding and accepting that the backgrounds and beliefs of groups of visitors/tourists to places such as national parks are not necessarily the same as those of park professionals and interpreters, we can begin to develop a more symmetrical model that allows for a two-way process of interaction between the visitor and nature, with benefits for both.
“Space” and interpretation

Nature is socially constructed and park agencies provide a space for individual experiences that are in some way related to nature. If these organizations construct the interpretation of nature according to their own cultural backgrounds and values, or those of individual operators and managers, what we will see is the positioning of the park manager’s (the host’s) values as superior to the “inferior” other of the tourists values and their view of nature.

We contend that the ideals of interpretation can only truly be achieved through continual coming together of the tourist and the others of the host and nature. It is unreasonable to expect that a single, one-off interpretive experience can result in transformational change in the opinions, values, and awareness of the visitor (Littlefair, Buckley & Wearing, 2002). This is one of the limitations of interpretation that relies heavily on textual messages commonly associated with impersonal techniques such as signs, markers, audio-visual aids and other infrastructure. Thus, the interpretive space can be conceived of as having a temporal dimension. The interpretive experience becomes then an ongoing process that extends beyond the boundaries of a single moment in time and place.

Creating an alternative framework

As long ago as 1992, Ham made a call to professional interpreters to “embrace the tourist”; a call which has been largely ignored from a theoretical perspective in the interpretation literature; this observation has also been expressed recently by others (cf. Markwell & Weiler, 1998; Uzzell & Ballantyne, 1998). By understanding tourists, interpreters may be better equipped to realize the potential for, and understand the limitations of, interpretive practice. As Wang (2000: 221) points out, “the sociology of tourism is useful not only because it offers a deeper and wider understanding of tourism, but also because it illuminates the fundamental principles that should underlie the development of tourism and tourism policy.” In supporting Wang’s argument, it is our view that similar conclusions about interpretation can also be drawn.

In addressing some of the deficiencies of current interpretive practices in this paper we have argued that the theory and practice of interpretation can be progressed if we incorporate the others of nature and host into the self. Both nature and the host are used here in developing a more holistic approach to understanding environmental interpretation through the self/other connection. Such an approach deconstructs the binary opposition of “self” and “other”. The concept of interpretation needs to move beyond ideas concerning activity and image to more fully incorporate the idea of individual subjective experience so that the tourist him/herself has a central part to play in the active construction of the interpretive experience. In placing the concept of interpretation in a socio-geographical context drawing on insights from interactionist theory we can begin to broaden our understanding of interpretation and the interpretive experience. Such a theoretical approach suggests that each tourist group will negotiate the meaning of the natural environment in order to establish the types of experiences they may expect to have while visiting there. Recognition that an interpretive experience is fundamentally based on interactive elements within the interpretive space visited by tourists raises the possibility of a more holistic understanding.

We argue strongly for an alternative model that is dependent on a more equitable distribution of power between Western and host cultures where interaction occurs in
interpretive space (see Table 2). In this model the culture of the local/host community is respected and the visitor/tourist is open to experiencing aspects of the “other” culture and its values with a view to learning and expanding their own personal views and beliefs. This shift in the relationships of power between tourist and host culture enables both to interact and learn from each other with an eventual hybridization of nature and an expanded view by both. The interpretive space represents a place which promotes interaction and learning and the tourist does not damage or destroy the culture of the host community. The interpretive space becomes the setting for learning and interacting with nature and the local/host community, and of improving quality of life through exploring new boundaries and enlarging the self. It is imbued with the traditional social and cultural values of the host community but is also open to dynamic interaction and exchange with those held by the tourist.

**Conclusion**

This paper has explored the social phenomenon of the interpretive tourism experience and linked, in a more individual way, the visitor experience with the site and its elements. It has examined the interpretive experience of the “tourist” within a process that enables an investigation of the “social self” (cf. Kellehear, 1996) in an exchange with the destination environment. Interactionism, therefore, has been utilized to provide a basis for a more comprehensive understanding of the interpretive tourism experience across culture due to the emphasis it places on the interaction that occurs between the tourist and the elements of the site they interact with. The paper has illustrated that the under-

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**Table 2: Model of Interactive Interpretive Tourism**

<table>
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<tr>
<th></th>
<th><strong>Western Society</strong></th>
<th><strong>Host Society</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Economic &amp; cultural exchange – more equitable distribution of power</td>
<td>Economic &amp; cultural exchange – more equitable distribution of power</td>
</tr>
<tr>
<td>Culture</td>
<td>Hybridization</td>
<td>Hybridization</td>
</tr>
<tr>
<td>Values</td>
<td>Quality of life – exploring new boundaries</td>
<td>Survival with increased standard of living, retaining cultural values</td>
</tr>
<tr>
<td>Place/Space</td>
<td>Tourist destination – a space to learn &amp; interact with nature and culture</td>
<td>Spaces imbued with traditional social value but open to dynamic interaction</td>
</tr>
<tr>
<td>People</td>
<td>Tourists as choraster’s (looking for interaction &amp; learning about others)</td>
<td>Hosts as educators and interpreters</td>
</tr>
<tr>
<td>Selves</td>
<td>Hybridized – incorporating new aspects from ‘other’ cultures ‘I’, ‘you’ &amp; ‘we’</td>
<td>Hybridized</td>
</tr>
</tbody>
</table>

(after Wearing and Wearing, 1997)
lying interpretive environmental experience is with the natural environment, but as the experience is socially constructed, the experience only takes on meaning through social interaction with others; for example a group member or community member. The tourist goes on a trip which involves taking on roles outside those in everyday life and interacting with others. These roles produce acts that are perceived and interpreted by “significant others” (significant others can include tour groups, host community, own community) and may redefine the individuals (the tourist or the community members) as a result of each other’s acts.

There is recognition of the need to enable a multi-disciplinary approach that provides frameworks for the multiplicity of information needed to study interpretive tourism experiences. An extension of the techniques found within interactionism in the exploration of wider parameters may enable a research approach that would establish methods for helping determine the attitudes and values held by community members and change within a destination community contributing to, amongst other things, the development of a framework that includes socio-cultural interaction in relation to addressing questions regarding transferring of attitudes and behaviors from host or guest and vice versa in the tourism experience.

Ittleson et al. (1974) maintain that the individual is not a passive product of their environment, but interacts with their environment and is in turn influenced by it. Interactionism suggests that the individual is an active, thinking unit who is able to construct a meaningful existence and a sense of self from the social milieu in which she/he lives:

“The individual expresses himself [sic] as such, not directly, but only indirectly, from the particular standpoints of other individual members of the same social group or from the generalised standpoint of the social group as a whole” (Mead, 1934: 138).

Meanings are formed by the individual and the process that takes place within the context of the social groups that surround them. The experience takes form from the meaning the tourist places on her/his own acts and the acts of others, and it is the act of interpretation that gives interaction its symbolic character. In this way the self is an “ontological structure which manifests itself in social space” (Wilson, 1980: 145). As outlined above, the self and actions made by the self are socially mediated and constructed. All qualities of the self that establish identity (for example, desire, reason, emotion, motives, values, and beliefs) and which affect the tourist’s behaviour in space, are socially constructed; the self is not static. Continually open to new possibilities, change and growth are possible through a complex learning process (Wilson, 1980: 140).

The inherent qualities of self enable the tourist to navigate the new social world and it is in this sense that the tourist’s self–identity is defined and expressed by her/his place–identity; a complex pattern of beliefs, values, feelings, expectations, and preferences relevant to the nature of the physical world (Proshansky, 1978: 161). The interpretive tourism experience takes place in this unfamiliar exterior world (the destination site) and as such, new information is presented and must be dealt with. Sometimes the navigational tools are insufficient to cope with the new situation. It is at these times that environmental stress and alienation are experienced and the individual must become reflexive, reconsidering and/or changing certain aspects of self, as they are now experi-
enced as outmoded or insufficient in addressing the new situation. Here interpretive material is used to support the sense of self and enable a reduction of stress. Put simply, participants’ values, ideas, beliefs, desires, and motives change as they go through life, thus the self is in continual development. The recognition of the social construction of individual qualities does not disregard the fact that people can and do change (Mead, 1934; Wearing, 1998). Individual qualities, no longer appropriate for new situations that the individual finds themselves within, or new situations they desire to be within, can and do change. The intimate objective gaze of the participant as self enables development. When interpretation can understand this, it is able to direct the nature of how the individual needs to receive information. Most sociological analysis of contemporary social systems founded on post-industrial production and focusing on urban dwelling lifestyles and the attendant processes of self construction through the work and production-ethics of those countries (cf. Bell, 1978; Berman, 1983; Campbell, 1987), is relevant to the discussion of the interpretive tourism experience across culture and its effect on the tourists sense of self and identity. In such societies, based on principles of commodification and consumption, a hedonistic valuation edict determines individual and social values in relation to personal identity, with the concomitant encouragement of the pursuit of identity through self-expression, leisure, consumer goods, and pleasure (Campbell, 1987; Moorhouse, 1983). The tourist experiences could then be said to fall within the tension created by their desire to choose an experience that can satisfy the values surrounding these areas.

The interpretive tourism experience in this way can assist the tourist and their tour group members in a mutual process of “becoming” (cf. Bradiotti, 1993; Irigaray, 1974). Through the tourist’s desire in this case to experience the natural world and the host community member’s desire to gain an economically sustainable lifestyle. The social exchange, as a lived experience, may then allow alternative subjectivities that move beyond the traditionally acceptable, recognizing both commonality and diversity between tourist and tour group member and thus creating the social value necessary for the sustainability and preservation of the protected area which is essential to the idea of an alternative tourism experience such as ecotourism.

“This person will eventually acquire a consciousness and knowledge of the natural environment together with its cultural aspects, that will convert him (sic) into somebody keenly involved in conservation issues” (Ceballos-Lascurian, n.d: 1).

By providing an alternative to the traditional tourism options currently available which promote and actively construct dominant stereotypes (such as the overseas resort holiday, entailing only a cursory encounter with divergent cultures and lifestyles while promoting the utility value of the environment), interpretation may allow individuals to be able to challenge and resist orthodox representations and utilize an avenue that provides the possibility of exploring alternative identities and lifestyles whilst investigating a new and profound relationship with natural ecosystems.

Of particular importance to our conceptualization of the interpretive experience, we have argued, is the notion of enlarging the self by empowering the tourist to interact – within the interpretive space – with the “other” of nature and host; thus enabling the tourist to be an active participant in the construction and meaning-making of their own
personal interpretive experiences.

We contend that this gives us an approach to creating interpretive spaces and hence interpretive experiences that may promote an expansion in thinking by interpreters which may at least be a beginning for the development of alternative progressive procedures and practices.

References


Assessment of Communication Focused on Human-Black Bear Conflict at Yosemite National Park

Brenda K. Lackey, Ph.D.
Cleveland Metroparks
Cleveland, Ohio

Sam H. Ham, Ph.D. 1
Department of Resource Recreation & Tourism
University of Idaho

Abstract
This study assessed how Yosemite National Park (YNP) targets the continuing problem of human-black bear conflicts via interpretive communication. The research examines how YNP delivers information to visitors about human-black bear conflicts, and how visitors receive that information. Key variables include message recall by visitors, the effectiveness of message content and media in reaching visitors in various overnight lodging locations, the spatial relationship between message delivery and bear incidents, and the role of park employees in delivering bear information to visitors. Results indicate that park visitors receive messages about bears. Inconsistencies between messages delivered via personal interpretive services and YNP bear management policy were revealed. Implications for future research and improving YNP’s human-bear communication program are offered.

Keywords
interpretation, communication effectiveness, human-black bear conflicts, national parks, recreation

Acknowledgments
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1. Address correspondence to Sam H. Ham, Department of Resource Recreation & Tourism, University of Idaho, Moscow, ID 83844-1139, USA. E-mail: sham@uidaho.edu.
Introduction

Concurrent with human population growth, interactions between wildlife and humans are becoming more common in areas where natural habitats still dominate the landscape. National parks have been the historical proving ground for managing wildlife problems. As people encroach upon wildlife habitat for recreation and tourism, potential conflicts for problem wildlife are created. Perhaps none of these locations are more vexing than in the more intensively used national parks, and perhaps none of the problem wildlife species is more challenging than the black bear (*Ursus americanus*) (Beecham & Quigley, 2001).

Human-black bear conflicts have an extensive history in Yosemite National Park (YNP), where bears have been given human food intentionally and unintentionally since the 1920s, resulting in a long-term relationship between humans and resident bears that has led to personal injury and property damage (Harms, 1977). This trend has continued in more recent years. Although the number of black bear-caused human injuries has decreased during the past 40 years, the number of total bear incidents, (including the amount of property damage caused by black bears) has increased (Thompson & McCurdy, 1995). Bear incidents are defined by YNP as “bluff charges or other aggressive behavior, personal injury, property damage, bears trapped in or released from dumpsters, and cases of bears obtaining human food” (U.S. Department of the Interior, 1998). Graber (1985) suggests that human food is the basis for nearly all conflicts between human beings and black bears that take place in native bear habitat.

The problem at YNP is based partially on overnight visitors’ failure to store food properly. According to data provided by McCurdy, Seher, & Madison (2001), a total of 654 bear incidents were recorded in 2000, resulting in an estimated $126,192 in damage. Vehicle damage accounted for 47 percent of all incidents and 90 percent of all property damage. Ninety-five percent of the vehicles were driven by visitors. A clear preponderance (83 percent) of front-country incidents occurred in Yosemite Valley. Human error (including improper food storage) was identified as the cause of 77 percent of all bear incidents in the park, compared to 62 percent in 1999 and 49 percent in 1998 (McCurdy et al., 2001). Not surprisingly, YNP officials have described their efforts to warn visitors about human-bear conflicts as the single most intensive public information program at Yosemite (Thompson & McCurdy, 1995). This has led to the realization that communication aimed at increasing visitor compliance with food storage regulations might be a viable strategy for reducing human-bear conflicts.

During summer 2000, a two-part assessment of the interpretive communication program addressing human-bear conflicts was conducted at YNP (Lackey, 2002). The overall intent of this assessment was to examine how the sender of interpretation and communication (YNP) was targeting the problem via personal and non-personal interpretive services. Our assessment also examined visitors’ recall of YNP’s human-bear related messages. Among the most important findings drawn from this study were that YNP overnight users are on average frequent repeat visitors who are experienced and familiar with the park; that their overnight accommodations vary in terms of food storage requirements and the difficulty and ease of using YNP-provided storage lockers; that through non-personal interpretive services alone, they are targeted with 141 unique messages related to bear-human conflicts and some 632 persuasion attempts; and that these messages are on the whole easy to
Based on these and other findings, an overarching conclusion was that YNP must become more strategic in targeting, and more persuasive in communicating, proper food storage to overnight visitors. Since highly familiar audiences are often less attentive to communication attempts than less experienced groups (Petty & Cacioppo, 1986; Roggenbuck, 1992), a concern was that YNP overnight users were no longer paying attention to or processing the numerous messages aimed at them. Adding to this suspicion was the sheer number of persuasion attempts and the low interest level of messages, suggesting that YNP overnight users might be habituating to messages about humans and bears, and that despite what the messages are saying, they perceive little risk or vulnerability with respect to black bears.

**Research Focus**
The present study was guided by four primary questions: (1) What relationships exist between visitors’ overnight location, their familiarity with the park, and their ability to recall bear warning messages? (2) What is the relationship between message content and media used by the park to deliver these messages and visitor recall of the messages? (3) What is the spatial relationship between where bear messages are communicated and the occurrence of bear incidents in the valley? and (4) What role do park employees play in delivering messages to visitors about human-bear issues?

**Study Area**
Yosemite National Park encompasses 747,959 acres (about the size of Rhode Island) on the western slope of the Sierra Nevada Mountains in central California. The study was conducted in Yosemite Valley, approximately a seven square mile area and one of six management districts within the park. The Yosemite Valley District is a developed area containing good black bear habitat. Between 1996 and 2000, annual park visitation averaged over 3.6 million, the majority concentrated in Yosemite Valley.

**Communication Model and the Persuasion Context**
The interpretive program at YNP aims to influence the behavior of visitors with regard to proper food storage, what they should do if they encounter a bear, and other related behaviors. Our research into these issues was influenced by the classic communication model (Laswell, 1948; Shannon & Weaver, 1949). This model divides communication into distinct components of sender, message, channel, and receiver factors. In persuasive communication, these components provide a useful heuristic for seeing the possible pathways of persuasion, but, as Ajzen (1992) has discussed, they have not proven especially useful in predicting or explaining the success and failure of behavior modification programs such as the bear communication effort at YNP.

The traditional approach to persuasive communication can be traced to Hovland, who viewed it as the process by which a communicator transmits verbal stimuli with the intent to change the behavior of the audience (Hovland, Janis, & Kelley, 1953). This approach, however, tended to ignore the content of the message and viewed audiences as passive receivers of the message. Ajzen & Fishbein (1980) suggest that without considering message content, the effect of numerous factors specific to the source and/or the receiver are difficult to distinguish. In education, we have traditionally believed that if a
teacher sends information and facts to the student, the student will then receive, process and learn the material. The same beliefs apply to recreation managers who assume that by providing safety messages in their park that visitors will attend to, read, and remember those messages, and ultimately behave in desired ways. But in fact, the process of receiving messages is not passive, but potentially very active, as audiences think about and filter message content through their current ways of thinking (Ajzen, 1992; Ham & Krumpe, 1996). From this perspective, it becomes clear why audience characteristics (such as their current beliefs, attitudes, and level of experience) need to be taken into account as messages intended to influence their behavior are designed and delivered.

Sender (Source) Factors
In the traditional communication model, the sender is often referred to as the source. For our purposes, we will refer to this component interchangeably as sender and source. In this context, the sender is YNP, both the National Park Service (NPS) and Yosemite Concession Services (YCS), with a given purpose of communicating information to visitors about human-bear conflicts and how to reduce bear incidents. In this paper, we address how the park uses personal and non-personal interpretive services to deliver human-bear related messages to visitors. Personal interpretive services are those involving direct contact between visitors and a park employee, and non-personal services are those that involve the use of various interpretive media (such as signs, videos, exhibits, etc.).

Of all the contextual factors studied in traditional communication theory, variation in source credibility has provided the most consistent findings in terms of a level of persuasiveness (Ajzen, 1992; Cox, 1999; McQuail, 2000). Source credibility refers to the perceived expertise and trustworthiness of the communicator, perhaps the most intuitive of all variables in persuasive communication. In the context of this study, the source is broadly viewed as YNP, yet an individual park employee such as an interpreter, enforcement ranger, or lodge employee is sometimes the direct sender of messages.

Message
Message content related to human-bear interactions at YNP includes information about proper food storage, actions to take if visitors encounter a bear, and related warnings (e.g., “Storing food properly is the law!” and “Warning - Bears active in the area”). We address how actual messages sent by YNP emphasizing certain content compare with messages recalled by visitors, and where these messages are located geographically in relation to bear incidents in the valley. Warning messages are designed to influence behavior with respect to a hazard, or in this case a human-bear problem. According to Young & Lovvoll (1999), such messages preferably contain information about the nature of the problem, consequences of experiencing the problem, and/or instructions on how to avoid the problem.

Channel
Communication channels in Yosemite Valley include both personal and non-personal interpretive media. In this paper, we address how the park uses non-personal media to deliver these messages and the frequency with which the various media are employed. Park employees, as the primary personal communication medium, need to be informed about bear problems in order to deliver accurate information to visitors, as
well as to avoid problems with bears themselves while living and working in the park. YNP currently provides human-bear safety information during employee orientation training. As stated in the YNP 1998 Draft Human Bear Management Plan (U.S. Department of the Interior, 1998), all NPS and YCS employees who have any visitor contact are responsible for informing and educating visitors regarding human-bear problems. The plan also states that all park employees will be responsible for being aware of current bear problems, management methods and current methods being implemented to reduce incidents. This directive for employees, as well as evidence showing that employees contribute to the number of incidents in the valley (28 reported incidents that resulted in over $5,000 in damage in 2000) justified the need to assess employees’ knowledge about human-bear conflicts in the park.

For personally delivered messages, we examine the role that park employees play in delivering bear-related messages to visitors. Other authors have written about the importance of equipping park employees with consistent and updated information about management problems. Dalle-Molle & Van Horn (1989) found that park and concession employees at Denali National Park had lower knowledge scores than visitors about precautions to take in order to avoid human-bear conflicts.

Receiver
Visitors to the park are intended receivers of human-bear messages. Of central interest in this study were overnight visitors in Yosemite Valley where the highest density of visitation occurs within the park, and where most of the bear incidents occur. Overnight accommodations encompassed campsites, cabins, and a lodge.

This research examines how well Yosemite Valley visitors recall bear-related information. Cognitive psychologists studying free recall describe the primacy effect as the high probability of recall observed for initial items (messages), and argue that primacy effect is a long-term memory phenomenon (Rundus, 1971; Sharps & Price, 1996). Initially the message enters short-term memory, but due to rehearsal (or elaboration), the person may sufficiently process the message for it to be incorporated into long-term memory.

We also look at how effectively visitors receive messages from the park taking into account their degree of familiarity with YNP, as measured by number of previous visits.

Research Methods
Visitor Survey (Receiver)
An on-site visitor survey addressed two research objectives: (1) to determine what messages visitors retain with respect to human-bear conflicts and the media that provided that information; and (2) to examine the visitors’ degree of familiarity with the park and messages recalled at specific overnight locations. A total of 2,032 visitor questionnaires were administered on site to visitors using a drop-off survey method (Salant & Dillman, 1994). Initial contact questions were asked of all participants to facilitate assessment of non-response bias. Respondents could either complete surveys on site to be picked up by research staff, or they could return them by mail in a prepaid envelope. A proportional stratified simple random selection was used, with sampling days randomly spread over the entire season (June – September, 2000) between weekdays and weekend days, and time of day (morning or evening). Sampling loca-
tions were randomly selected from among four strata of Yosemite Valley overnight sites. The four strata were distinguished by the type of food storage provided by YNP at that location (one food storage locker provided at individual campsite, two lockers provided at the campsite, food storage lockers absent from the site, and food storage in overnight lodge room).

Visitors were asked to fill in a matrix in which they wrote from free recall any messages related to black bears and visitor safety that they remembered getting. The matrix also asked them to indicate the medium through which they received each message (sign, brochure, ranger, etc.) and the day of their visit they recalled receiving it. The question asked respondents, “What did you learn about black bears and your safety?” As discussed by Lang (2000), what a visitor remembers from a message is the result of how much of the message was encoded, how well the encoded information was stored, and how much of that stored information is retrievable. Free recall was the method of measuring visitors’ memory. According to Lang (2000:56), free recall “indexes the retrieval process, that is, how well a subject can retrieve a piece of information without any cues at all,” thus providing a superior measure of the subject’s actual working memory.

Two control variables were examined for predicting which messages visitors remember: (1) where visitors stay overnight in the valley, and (2) their familiarity with the park (first-time vs. repeat visitor). Our prior research (Lackey, 2002) suggested that visitors’ overnight location might be predictive of bear messages that they remember. Because the various overnight locations and their corresponding food-storage requirements are managed differently in Yosemite Valley, different messages appropriate for each situation are required. We were interested in examining whether visitors’ familiarity with the park was related to their ability to recall messages mainly because 70 percent of YNP overnight users are repeat visitors. As previously explained, a concern exists that high-familiarity audiences such as YNP visitors might not be seeking information, and therefore are inattentive to attempts to influence their behavior (Lackey, Beecham, Quigley & Ham, 2001). Furthermore, incident-free past experiences in YNP may lead them to perceive less bear-related risk, compared to first time park visitors.

Linear logit model analysis (Fienberg, 1981) was used to model how well the overnight location of visitors and their familiarity with YNP predicts the message(s) they remember. Logit model analysis stems from loglinear analysis, a multivariate categorical analysis, and either examines relationships (log expected) or builds models (logit). With logit models our interest lies only in the effects of the explanatory variables (overnight location and familiarity) on the response variable (messages remembered). Logit models are the categorical response analogs to regression models for continuous response variates (Bishop, Fienberg, & Holland 1975; Fienberg 1981; Grizzle, Starmer, & Koch 1969).

Non-Personal Services (Sender)
A comprehensive inventory of non-personal services in the valley assessing YNP interpretive messages containing references to human-bear conflicts was conducted during June-August 2000 (Lackey & Ham, 2003). The inventory was conducted in two phases. First, we documented the content, media, location, and other details about every individual bear message. Second, we analyzed content, media and location by comparing: (1) message content emphasized by the park with those messages recalled by visitors; (2) the location of messages with the occurrence of bear incidents; and (3) the media used by YNP with media recalled by visitors.
Various methods were used to assess the park’s personal interpretive services that communicate with visitors about black bear-related issues. First, an employee survey was administered to determine employees’ knowledge about black bears in YNP and park policies related to the existing black bear management program. Second, brief interviews (less than one minute) were conducted with employees working at a variety of jobs within the valley to assess their knowledge related to common questions visitors ask about bears. Third, bear messages imparted to visitors at evening interpretive programs by NPS and YCS staff were recorded. Finally, communication of bear messages imparted to visitors by roving interpreters on campground patrol was also monitored.

**Employee Survey.** The survey was administered to employees working for YCS and NPS who lived in the valley during the summer of 2000 (totaling about 1,300 including 1,000 YCS and 300 NPS employees). Housing lists were acquired for residents and a proportional sampling procedure was administered based on the number of housing sites in each housing category. We distributed 494 surveys to the residences of employees in the valley. Among other questions included in this survey, we were particularly interested in (1) employees’ current beliefs about a range of black bear issues, (2) their perception of how bear safety information is made available to them, and (3) their objective knowledge about the policies of the current black bear management program in YNP. The latter included a series of true-false knowledge questions (for example, True or False: “Yosemite law enforcement rangers can impound vehicles in the park after dark if they observe food items inside them.”)

**Employee Interviews.** Thirty-two randomly selected park employees (both YCS and NPS) were briefly interviewed face-to-face about the most common bear-related questions asked by visitors, and how often employees are asked these types of questions. Employees were chosen who represent various work areas within the valley, such as a store cashier, maintenance worker, shuttle bus driver, camp host, and an assistant manager at an overnight location. The purpose of these interviews was to assess whether all park employees who come in contact with visitors are prepared to accurately address visitors’ questions about bears.

**Observation of Interpreters.** A function of the park’s interpretation division is to “increase awareness among park visitors, employees, and residents about black bear-human conflicts in the park through personal contacts [and] programs” (Madison & McCurdy, 2000). Yosemite interpreters therefore play an important role in the human-bear management program. Because campfire programs are strategically important times to remind overnight visitors of proper food storage procedures, NPS and YCS interpreters were strongly encouraged to include a human-bear related message at all evening interpretive programs in the valley. Researchers opportunistically attended 13 evening programs throughout the summer months (June – September) at various program locations in the valley to listen for the inclusion of human-bear related messages.

Throughout the study period, NPS roving interpreters conducted nightly campground tours focused on distributing bear information at campgrounds throughout the valley. The rangers walked from site to site informing (or reminding) campers of the proper ways to store their food and to remove all bear “incentives” from their vehicles. During the summer, we observed seven roving interpreters and eavesdropped on their interaction with visitors.
Results and Discussion

Visitor Survey (Receiver)

A total of 1,547 of 2,032 surveys were returned, resulting in an overall response rate of 76.1 percent, with approximately 31 percent of the surveys returned on site. Comparisons of respondents and non-respondents revealed no major differences with respect to number of previous visits, residence, or group size, leading us to conclude that systematic bias due to non-response is not a concern with these data. Overall, 98 percent of both groups reported seeing or hearing some type of information about bears and their safety during their visit.

Respondents were asked to recollect bear-related messages encountered in the park. Generally, the messages they recalled can be categorized as: (1) how to store food properly; (2) what to do if they encounter a bear; (3) warnings not to feed animals in the park; (4) messages about storing all scented items; (5) information about consequences for humans or bears; (6) bear behavior facts; or (7) how to dispose of trash properly.

Based on the well-established primacy effect and long-term memory, we argue that the first messages that come to a visitor’s mind (when asked, “What did you learn about black bears and your safety?”) are salient or prominent and in the forefront of their minds. Initial messages are more likely to have been incorporated in a visitor’s long-term memory than those recalled last. Therefore, our analyses focused on the first two messages recalled by each visitor in chronological order.

Narrative responses were collapsed from seven into four categories that captured a majority of visitor responses and re-coded in SPSS to categorical variables prior to analysis. A goodness-of-fit test was used to identify a parsimonious model that explained the phenomenon. Least squares ratio (LR) chi-square is reported as opposed to Pearson because: (1) the expected frequencies used in model analysis are estimated by maximum-likelihood methods; and (2) LR chi-square can be used more efficiently in analysis of multi-way contingency tables (Knoke & Burke, 1980). Larger p values reflect a better fitting model.

Table 1 presents logit models for the first and second messages remembered by respondents, which when combined capture 74.5 percent of the responses. In predicting which messages visitors remember, the overnight site location (S in the model) alone is most predictive. Familiarity (F in the model) alone is not a strong predictor, yet the combination between overnight site location and familiarity does provide a good fit for this model. The best fitting models are: \( \mu + S_j \) \((df = 15, L.R. \chi^2 = 13.67, p=.551) \) and \( \mu + F_i + S_j \) \((df = 12, L.R. \chi^2 = 12.06, p=.441) \). The mean \( (\mu) \) in the model alone provides no information in predicting what messages are remembered.

These results indicate that familiarity (F) never emerges as predictive alone. Either site location (S) alone, or (F) and (S) combined, are the most predictive. The logit analyses provide an initial screening of the data suggesting that where visitors stay overnight is a strong predictor of bear messages they remember receiving. The next step of the analysis examines which messages are remembered by visitors, combined with where they stayed overnight in the park.

The data presented in Table 2 suggest that most messages remembered by visitors pertain to food or trash storage. The lower percentage of responses in the food/trash storage category at Yosemite Lodge (64.8 percent) is noteworthy since at YL visitors store food inside their lodging units (requiring few special instructions) whereas visitors at
other sites use outdoor lockers. Probably for this reason, food storage information does not appear to be as memorable to visitors staying there. Table 2 presents the four categories of messages collapsed from the original seven categories, which captured the majority of responses.

Non-Personal Services (Sender)

Message Emphasis. The initial seven universal message categories established from visitors' open-ended responses were then used in distinguishing and categorizing actual messages sent by the park. These categories were compared to determine if the emphasis placed on certain messages sent by YNP (as measured by frequency of occurrence) is similar to messages recalled by visitors (Table 3). The sender percentages were determined from the number of unique sentences (1,068 sentences) referring to human-bear safety. The receiver percentages were established from the number of messages remem-

<table>
<thead>
<tr>
<th>Messages Remembered (4 categories)</th>
<th>Food/Trash Storage</th>
<th>Bear Facts/Behavior</th>
<th>What to do if encounter a bear</th>
<th>Don't feed the animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Location</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curry Village (CV)</td>
<td>75.3</td>
<td>14.0</td>
<td>8.5</td>
<td>2.2</td>
</tr>
<tr>
<td>Yosemite Lodge (YL)</td>
<td>64.8</td>
<td>18.8</td>
<td>10.9</td>
<td>5.5</td>
</tr>
<tr>
<td>Camp 4 (C4)</td>
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<td>13.7</td>
<td>5.3</td>
<td>5.3</td>
</tr>
<tr>
<td>Housekeeping Camp (HC)</td>
<td>76.9</td>
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<td>8.0</td>
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<tr>
<td>Pines(^1)</td>
<td>68.3</td>
<td>14.6</td>
<td>14.6</td>
<td>2.5</td>
</tr>
</tbody>
</table>

\(^1\) Pines = Lower, North & Upper Pines Campgrounds.

Note: Row figures add up to 100% because analyses focused only on the first message remembered.

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Table 1 Logit models for predicting visitor message recall using site location and familiarity independent variables. (4 universal message categories used in analysis).

<table>
<thead>
<tr>
<th>First Message Remembered(^1)</th>
<th>df</th>
<th>L.R.(^2)</th>
<th>P</th>
</tr>
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<tbody>
<tr>
<td>(\mu + F_i + S_j)</td>
<td>12</td>
<td>12.33</td>
<td>.419</td>
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<tr>
<td>(\mu + F_i)</td>
<td>24</td>
<td>33.38</td>
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</tr>
<tr>
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<td>15</td>
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<td>.551</td>
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<tr>
<td>(\mu)</td>
<td>27</td>
<td>35.23</td>
<td>.133</td>
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</table>

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<thead>
<tr>
<th>Second Message Remembered(^2)</th>
<th>df</th>
<th>L.R.</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\mu + F_i + S_j)</td>
<td>12</td>
<td>12.06</td>
<td>.441</td>
</tr>
<tr>
<td>(\mu + F_i)</td>
<td>24</td>
<td>37.80</td>
<td>.036</td>
</tr>
<tr>
<td>(\mu + S_j)</td>
<td>15</td>
<td>20.23</td>
<td>.163</td>
</tr>
<tr>
<td>(\mu)</td>
<td>27</td>
<td>46.02</td>
<td>.013</td>
</tr>
</tbody>
</table>

\(^1\) First message remembered captures 45.3% of the responses

\(^2\) Second message remembered captures 29.2% of the responses

\(^a\) Least squares ratio chi-square
Based on the proportion of message emphasis delivered by the park, it appears that visitors are generally recalling the messages about “proper food storage,” “bear behavior/facts,” “what to do if they encounter a bear,” “storing scented items,” and “do not feed the animals” in an equal or greater proportion to the effort made by the park. These results also suggest that visitors are recalling messages emphasizing “consequences for humans or bears” and “proper trash disposal” to a lesser degree than the emphasis given those messages by YNP. Such findings may indicate that although YNP is sending these messages, many visitors are not engaging with them and processing them. In the case of “consequences for humans or bears,” failure of visitors to understand their own vulnerability could lead to lower compliance with food storage requirements despite the fact that they are receiving that message from the park (Floyd, Prentice-Dunn & Rogers, 2000).

Table 4 shows the locations of message occurrences throughout the valley in accordance with where bear incidents were reported in 2000. The results indicate that three of the valley locations (Curry Village, Camp 4, and Wilderness parking lot) have proportionately fewer messages when compared to the number of bear incidents. The non-sig-

---

**Table 3. Message Emphasis by Sender Compared to Message Retention by Receiver.**

<table>
<thead>
<tr>
<th>Message Category</th>
<th>Example Messages</th>
<th>SENDER (%)&lt;sup&gt;2&lt;/sup&gt;</th>
<th>RECEIVER (%)&lt;sup&gt;3&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Food Storage</td>
<td>“Store food in lockers”</td>
<td>33.2</td>
<td>53.4</td>
</tr>
<tr>
<td></td>
<td>“No food in or around tent cabins”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consequences for Humans or Bears</td>
<td>“Bears can damage your vehicle”</td>
<td>19.1</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>“Bears are relocated and sometimes destroyed”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bear Behavior/Facts</td>
<td>“Bears have a keen sense of smell”</td>
<td>15.5</td>
<td>15.5</td>
</tr>
<tr>
<td></td>
<td>“Bears become conditioned to human food”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper Trash Disposal</td>
<td>“Place all food and garbage in bear proof dumpsters”</td>
<td>8.9</td>
<td>2.8</td>
</tr>
<tr>
<td>Store Any Scented Items</td>
<td>“Keep your car clean of all scented items”</td>
<td>6.8</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>“Include toothpaste and perfume”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If You Encounter Bear</td>
<td>“Yell and clap your hands”</td>
<td>5.5</td>
<td>12.8</td>
</tr>
<tr>
<td></td>
<td>“Stand in group to intimidate the bear”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t Feed Animals</td>
<td>“Don’t leave food out to feed the bears”</td>
<td>2.9</td>
<td>3.5</td>
</tr>
</tbody>
</table>

<sup>1</sup>Comparisons based on seven initial message categories prior to collapsing.<br>
<sup>2</sup>Percentage of messages sent by YNP.<br>
<sup>3</sup>Percentage of messages recalled by visitors.
significant rank-order correlation coefficient (rho) is further indication that YNP may be disproportionately distributing strategic messages when the locations of actual bear incidents are taken into account (a positive rho would be expected if the two distributions were in accordance).

Media Emphasis. Messages that reference human-bear conflicts are delivered using six primary non-personal communication media: audio, video, internet, brochures, displays/exhibits, and signs/flyers. Figure 1 illustrates the relative effort by YNP to use the various media to deliver these messages. The use of brochures and videos appear more effective based on message recall by visitors, while signs/flyers and displays/exhibits appear less effective, as measured by message recall.

Personal Services (Sender)
Employee Survey. Only 165 (or 33 percent) of the 494 surveys were returned, which may indicate a degree of apathy among park employees towards the topic of human-bear conflicts in the park, or park policies in general. Alternatively, employees with less knowledge about bears might have been more reluctant to respond to the survey than those more confident in their knowledge about bears. Thus the data may be biased toward higher than actual knowledge levels among employees. Indeed, the findings did indicate that, overall, respondents were relatively knowledgeable about the current black bear management program. An area of concern, however, may be that nearly 25 percent of the respondents “didn’t know” that law enforcement rangers can impound vehicles after dark if food items are observed inside the vehicle. Also, over 44 percent of the respondents believe the myth that problem bears in Yosemite are euthanized (killed) using a “three strikes and you’re out” policy, while 29 percent reported they “didn’t know.” Based on such a low response rate, we cannot be certain that these respondents represent the population of employees living and working in the valley during the summer of 2000, but if they do, park employees may need to be better informed about bears in Yosemite Valley.

Employee Interviews. The 32 employees who were interviewed worked at a variety of jobs within the park and had worked there anywhere from 1.5 months to 12 years. When asked how often they receive bear related questions, 44 percent said “several times a day,”

### Table 4 Message Occurrence Compared to Bear Incidents by Valley Location in 2000.

<table>
<thead>
<tr>
<th>Valley Location</th>
<th>Message Occurrence(%)&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Bear Incident (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Pines (UP)</td>
<td>30.8</td>
<td>25.8</td>
</tr>
<tr>
<td>North Pines (NP)</td>
<td>19.9</td>
<td>6.4</td>
</tr>
<tr>
<td>Curry Village (CV)</td>
<td>11.4</td>
<td>37.5</td>
</tr>
<tr>
<td>Lower Pines (LP)</td>
<td>9.3</td>
<td>5.7</td>
</tr>
<tr>
<td>Ahwahnee Lodge (AL)</td>
<td>8.1</td>
<td>2.1</td>
</tr>
<tr>
<td>Housekeeping Camp (HC)</td>
<td>7.2</td>
<td>4.1</td>
</tr>
<tr>
<td>Camp 4 (C4)</td>
<td>5.6</td>
<td>9.1</td>
</tr>
<tr>
<td>Backpacker s Camp (BC)</td>
<td>3.1</td>
<td>.72</td>
</tr>
<tr>
<td>Yosemite Lodge (YL)</td>
<td>2.7</td>
<td>.24</td>
</tr>
<tr>
<td>Wilderness Pkg. Lot (WP)</td>
<td>1.9</td>
<td>8.4</td>
</tr>
</tbody>
</table>

<sup>1</sup> Unique message occurrence tallied by number of messages a visitor is potentially exposed to in that particular location. Spearman’s rho .503 (p>.05).
13 percent said they were asked “a few times a day,” and 31 percent said “a few times a week.” Only one employee stated that she had never received questions about bears from visitors. These results demonstrate that employees working at a variety of jobs within the park are a potential channel for communicating bear related information to YNP visitors.

Of these, four focused mainly on bear-related topics and nine were about other topics. Regardless of the program topic, interpreters were encouraged by their supervisors to include a bear-related message at every evening program. Of the nine programs not related to bears, we observed that four (44 percent) did include a bear-related message, and five (56 percent) did not. Although based on only 13 observations, these results may provide a gauge as to the frequency and consistency of bear messages being delivered at evening programs in the valley.

Likewise, observation of seven roving interpreters revealed some concerns, but the results cannot be considered representative of all park interpreters. One newly-trained interpreter was observed presenting visitors with misinformation about proper food storage. For example, when a visitor asked if it was OK to leave dried food in a vehicle since he had no more room in the food locker, the ranger said yes, it was OK, as long as it was covered. On the other hand, we also observed interactions in which campers felt falsely confident that they knew what items needed to be stored in food storage lockers, until the interpreter listed all of the unusual items such as sunscreen and toothpaste. Four interpreters were observed mentioning these unexpected items.

**Implications**
How effectively is the communication process at YNP working in terms of targeting
bear-human conflicts? This initial assessment has examined visitor recall of disseminated messages, the effectiveness of message content and media, the spatial relationship between message dissemination and bear incidents, and the role of park employees in delivering bear information to visitors. Based on the message-recall data, visitors appear to be receiving messages about bears. Results of the logit analyses supported the hypothesis that the overnight location where visitors stay in the valley is an important consideration in designing bear-related messages specific to those areas, and that visitor familiarity with the park may not be a significant deterrent to attention paying as earlier thought. Although we have evidence that visitors are receiving messages about bears, we need to better understand the link between message content and design, and visitors’ processing of and compliance with those messages. In particular, it will be important to determine why such high knowledge levels among visitors are not reflected in higher compliance rates with YNP food storage policies.

To examine the “sender” side of the communication process, we assessed both nonpersonal and personal communication. First, based on the proportion of message emphasis delivered by the park, it does not appear that visitors are recalling intended messages in equal proportion to the park’s emphasis on those messages. Furthermore, even in cases where visitor recall matches or exceeds emphasis by the park, this does not necessarily mean that large percentages of visitors are actually getting the messages, particularly those related to proper food storage. YNP may want to reevaluate certain message categories to determine if they need greater emphasis. Second, we compared the spatial locations of messages and bear incidents. Results indicate that three of the valley locations (Curry Village, Camp 4, and Wilderness parking lot) have proportionately fewer messages when compared to the number of bear incidents. These locations may need further attention to decide whether more strategically placed messages are necessary. In addition, one location with a high incident rate also is the site of heavy message emphasis. This may be a case where an intensified interpretive effort resulted from previous bear incidents, or it may indicate that the current communication interventions are ineffective. Third, the message inventory revealed that YNP is using a wide range of media to deliver bear-related messages. By comparing the media used by the park with how visitors remember receiving messages, the results provide a gauge for determining whether some media are more effective in reaching visitors (based on visitor message recall) than other types of media. Currently, YNP’s brochures and video appear more effective than other media in sending memorable messages to visitors.

Because park employees represent an important communication channel for bear-safety information, we surveyed park employees about their knowledge of the bear management program. Findings suggest that some YNP employees are not well informed regarding the bear-management program in the park. Next, we conducted employee interviews and found that park employees in a variety of jobs indeed are potential channels of bear-related information. Last, we observed interpreters at evening campfire programs and during campground roving activities. We found that interpreters were not consistently including a bear message during their evening talks. We suggest that campfire programs remain strategically important in terms of delivering bear information to overnight users and that YNP should renew efforts to ensure that every evening program include an appropriate warning about proper food storage. In addition, observations of campground roving activities indicated a possible lack of consistency in the information
delivered to campers about food storage requirements.

The research reported here must be considered a first-step in understanding the complex relationships between communication and visitor behavior in a diverse setting such as YNP. YNP is continuing to work toward improving the effectiveness of communication efforts aimed at reducing human-bear conflicts. Based on results of this study, a series of experiments is being conducted to test the effectiveness of message content and the effects of visitor familiarity on attention paying, perception of risk, and compliance with food storage regulations.

References


The Benefits of Naturalist-Led Interpretive Programs: Implications for User Fees

Dr. Mark Morgan
Department of Parks, Recreation & Tourism
105 Natural Resources Building
University of Missouri-Columbia
Columbia, MO 65211

Dr. James Absher
USDA Forest Service
Pacific Southwest Research Station
4955 Canyon Crest Drive
Riverside, CA 92507

Rob Whipple
Big Bear Discovery Center
San Bernardino National Forest Association
Fawnskin, CA 92333

Abstract
The 1996 Recreation Fee Demonstration program allowed some federal resource management agencies to keep a portion of user fees generated on-site, instead of returning all revenue to the general treasury. Funded primarily through entrance, activity, parking, and interpretive fees, this legislation has been successful in reducing the maintenance backlog for participating agencies. However, it is unclear what effect user fees might have on visitors attending interpretive programs and the benefits that agencies might be receive from implementing this policy. A field experiment was conducted to measure the outcomes of a naturalist-led, fee-based canoeing program offered by the San Bernardino National Forest Association in southern California. Two hundred twenty-seven canoeists at Big Bear Lake answered questions about their trips during the summer of 1999. Results indicated that the naturalist not only increased visitors’ appreciation of the resource, but also enhanced their perceptions of U.S. Forest Service fee policies.

Introduction
If visitor satisfaction is a goal of resource management agencies, then a range of opportunities should be provided which reflect four types of recreation demand: activities, settings, experiences, and benefits (Manning, 1999). Outdoor learning plays an important role in visitor satisfac-
tion (Roggenbuck, Loomis, & Dagastino, 1990), but it is unclear how “education” is explained by the recreation demand model since it can occur at more than one level. Other factors such as insufficient funding, time, and personnel limit our understanding of communication processes in outdoor settings. Since the number of published studies on interpretation are not plentiful, resource managers must speculate about the potential benefits that accrue to visitors and agencies. Carlson (1995) challenged the interpretive profession to determine the effectiveness of communication strategies by means other than intuition and common practice.

Interpretation is used frequently to accomplish management goals and to promote public awareness of agency rules, regulations, and policies. In a national study, Hooper and Weiss (1991) found overwhelming support of interpretation as a management tool. This may be due to the expanded role that many naturalists have acquired from budgetary constraints. Another reason for this shift in priorities relates to the strict application of ecological principles without regard to public opinion. Biologically sound decisions on environmental issues often result in criticism, failure, or litigation because of misinformation (Jacobson, 1999). Developing an extensive information network with the public is essential if resource management agencies wish to broaden their base of political and financial support. In fact, Morgan (1993) suggested that communication ought to be one measure of success. Naturalists can assist with this task. Because the public often lacks knowledge about natural resources or specific management policies, many government agencies try to modify visitors’ knowledge, attitudes, and behavior through information-based approaches. Typically these messages are framed within the broader context of interpretation. Many agencies have implemented user fees to recover program costs or generate additional revenue, especially for personal communication services. How much is known about the potential effects of fees and charges, now that some visitors are paying for persuasion? What is the relationship between price, expectations, and visitor satisfaction? Can fee-based interpretation be used to accomplish management goals such as public understanding of agency policies? Can naturalists assuage the effects of pricing? This study addresses these research questions and provides some managerial implications for setting fee policies.

**Literature Review**

Visitor satisfaction on public lands has become a high priority since passage of the 1996 Omnibus Consolidated Rescission and Appropriations Act (PL 104-134). This legislation authorized the U.S. Forest Service (USFS) and other resource management agencies to collect revenues at certain locations under a provision known as the Recreation Fee Demonstration Program (RFDP). Agencies are allowed to keep a portion of funds and use them for on site enhancements, such as maintenance projects. This influx of “new” money has been a financial windfall for agencies participating in the RFDP and many outdoor recreationists seem to support user fee policies (Vaske, Donnelly, & Taylor, 1999).

The RFDP has stimulated a considerable amount of interest in fees and charges in the recreation literature. For example, the *Journal of Park and Recreation Administration* (1999) and the *Journal of Leisure Research* (1999) devoted special issues (17, 3 and 31, 3, respectively) to the study of fees and charges. A variety of fee-based topics were addressed, such as public acceptance (Vogt & Williams, 1999), social trust (Winter et. al, 1999), ethics and values (Trainor & Norgaard, 1999), equity (More, 1999), and displacement.
ment (Schneider & Budruk, 1999), but none relating to interpretive services.

Much of the published literature on user fees is either philosophical or policy-oriented. Of the empirical articles published, most are descriptive studies. Several authors (Kyle et al., 1999; McCarville & Crompton, 1987; McCarville, 1991; McCarrville et al., 1993; McDonald et al., 1987) have used social science theory to help understand, explain, or predict certain outcomes. Usually these studies are based on responses to hypothetical scenarios involving admission prices or willingness to pay for recreational amenities. Experimental designs, especially those employing field-based studies, are virtually non-existent.

In this study, social science theory was used as a basis for understanding visitors’ reactions to user fees for interpretive programs. Social exchange theory (SET) is one way to explain the decision-making process used by many individuals. Based on cognitive psychology, this theory assumes that people utilize a cost-benefit strategy when evaluating the relative merits of goods, products, or services (Foa & Foa, 1975). If costs are high, then benefits (rewards) must be significant. In contrast, most people are willing to accept fewer benefits if costs decrease. Many people seek opportunities which they can maximize benefits and minimize costs. Achieving this goal often produces the greatest satisfaction. At the very least, people want to maintain congruence over the cost-benefit relationship. If costs outweigh the benefits, then many people will react negatively.

McDonald et al. (1987) tested the relationship between user fees and expected benefits using SET. It was anticipated that more benefits would be expected as costs increased. Except for those willing to pay $5 or more, it was found that river recreationists were reluctant to expect more benefits (services, facilities, and programs) as willingness-to-pay (costs) increased. One conclusion of this study was that managers could implement a modest fee without causing visitors to desire more benefits. However, the cost-benefit relationship was not positive, because it was thought that some visitors would pay higher fees to limit development.

Does the simple act of charging a fee raise the expectations for those participating in interpretive programs? This relationship has been widely speculated, but not empirically tested (Knudson, Cable & Beck, 1995). In theory, if costs exceed the benefits, then dissatisfaction would result. Negative publicity generated through word-of-mouth might result in lower attendance at programs. Perhaps the fear of creating higher expectations [and possible decreases in participation] has kept many forms of interpretation underpriced in today’s marketplace.

The purpose of this study was to determine the outcomes of fee-based interpretive programs on wildland recreationists. Specifically, it compared self-guided versus naturalist-led canoeists on motives, attitudes, knowledge, perceptions of the naturalist, and beliefs about USFS user fees. An experimental design was used to isolate and test these effects. It was hypothesized that no significant differences would occur between treatment and control groups for any dependent variable.

**Methods**

**The Setting and Subjects**

Big Bear Lake (BBL), a scenic, high elevation reservoir in the San Bernardino National Forest, was selected as the testing site. Big Bear Lake is one of the largest freshwater impoundments in southern California available for outdoor recreation purposes.
Approximately 6 million tourists visit the area annually. Faced with a large demand for services, but working on a limited budget, USFS personnel forged a partnership with the San Bernardino National Forest Association (SBNFA) to facilitate visitor information services. Using RFDP funds, the SBNFA constructed Big Bear Discovery Center and hired a full-time naturalist to conduct interpretive programming.

One of the fee-based programs developed for BBL visitors was a naturalist-led canoe trip. Although profitable in its first season, USFS personnel wanted to determine how user fees affected visitor satisfaction of interpretive programs. Due to the limited number of naturalist-led trips, the USFS attempted to collect data from every canoeist during the study period (May to September, 1999). Using a census approach improved the statistical power of the design and generalizability of the results. It was not possible to control the number of canoeists who participated in the trips.

Experimental Design and Treatments

Over two decades ago, Roggenbuck (1979) recommended the use of field experiments as a way to measure the effectiveness of interpretive programs. The primary advantage of using this approach is to draw better conclusions since cause-and-effect relationships can be tested. Rarely is this feature available when conducting survey research. To date, few experimental studies have been published on visitors in naturalistic settings. Morgan et al. (1997) used a quasi-experimental design in a National Forest to test the relative effectiveness of youth and adult naturalists when delivering interpretive programs.

This study evaluated visitor satisfaction of fee-based interpretive programs at BBL using two controls and two treatments, paired within a 2 X 2 factorial design. The main effects included two levels of “timing” (before and after canoeing) and two levels of “structure” (self-guided and naturalist-led trips). See Figure 1.

Self-guided participants (C1 & T1) were defined as those renting canoes at BBL for two hours ($15 per canoe or $7.50 for double occupancy). This amount of time was comparable to the naturalist-led trips, but self-guided canoeists were not exposed to any interpretive information. The selection of self-guided canoeists was not random since a sampling frame was unavailable. In order to minimize variance, however, participants were selected at the same marina used by the USFS for fee-based programs, and on the same weekends that the treatments occurred. To improve statistical comparisons, the goal was to obtain at least 30 self-guided canoeists in C1 and T1. Naturalist-led canoeists paid either $18 or $12 (adult and child prices, respectively) for a two-hour interpretive program at BBL. Participants in C2 and T2 were led by the same naturalist and were presented with virtually identical programs.

Measurement occurred either preceding or immediately after canoeing. A USFS intern surveyed all self-guided canoeists, either before or after their trips. Self-guided canoeists completed their questionnaires at the marina. The naturalist distributed questionnaires in all the fee-based trips. For the control group, this was accomplished at Big Bear Discovery Center prior to departure. The treatment group answered their questionnaires at the marina immediately after the trip was completed. Testing times (before or after canoe trips) were systematically rotated to minimize the effect that Friday trips might differ from those taken on Saturday. Time constraints and the likelihood of a pre-test sensitization effect prevented the use of a pre- and post-test design. This quasi-experiment is known as a post-test only, control group design (Campbell & Stanley, 1963).
Experimental designs are valuable to the degree they lessen the number of rival hypotheses. Threats to internal validity were minimized by controlling the following variables: time (days and start times), location, naturalist, and the presentation. Efforts were made to ensure that differences in the dependent variables were attributed to trip structure, but the inherent nature of field experiments makes this difficult to control. There is a certain degree of tension between internal and external validity when using experimental designs. In this study, naturalistic conditions somewhat weakened internal validity, but strengthened external validity. The benefit of generalizability (increasing external validity) should outweigh any potential criticisms of not maintaining stricter controls over the design (maximizing internal validity).

**Questionnaire**

The USFS wanted to determine the outcomes of fee-based interpretation which resulted from naturalist-led canoe trips at BBL. Some factors used to evaluate interpretive effectiveness included attitudes, knowledge, and perceptions of the naturalist (Morgan et al., 1997). Building on the previous work, two additional aspects were included in this study: motives and beliefs about USFS user fee policies. Broadly, these outcomes can be grouped according to visitor experiences (motives, attitudes, and knowledge) or agency benefits (perceptions of the naturalist and beliefs about USFS user fee policies).

Participants received one of four questionnaires, depending on which canoe trip was taken. If canoeists were part of a control group, questions were phrased as “expectations,” whereas treatment groups were asked about “satisfaction” with their trips. Except for verb tense, all items remained constant. Distinguishing between a motive and a benefit can be difficult (Manning, 1999). For example, education can be viewed as an activity, setting, experience, or benefit, depending upon how the item is phrased. Driver (1990) defined a benefit as an “improved condition” that occurs in individuals. Mannell and Iso-Ahola (1987) state that motives are antecedents of recreational participation, whereas satisfaction is the result or outcome of experiences. As applied to this study, items answered prior to canoeing were considered as motives (measured as “expectations”), whereas items com-

<table>
<thead>
<tr>
<th>TIMING</th>
<th>self-guided (rental)</th>
<th>naturalist-led (profit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre-trip</td>
<td>C1</td>
<td>C2</td>
</tr>
<tr>
<td>post-trip</td>
<td>T1</td>
<td>T2</td>
</tr>
</tbody>
</table>
plicated after the trips were regarded as benefits (measured as “satisfaction”).

A motive scale was developed which included the following items: enjoying the sights and sounds of nature, relaxing, escaping daily routines, experiencing quietness, learning about the outdoors, developing skills, spending time with family/friends, and meeting others with similar interests. Each item was scored independently using a 5-point Likert type scale (1 = “not at all,” through 5 = “extremely important”). None of the items were reverse coded. An overall score was calculated for each canoeist by averaging the 8 items. The scale was tested for internal consistency using Cronbach’s alpha and yielded a reliability coefficient of 0.788.

The attitude scale measured canoeists’ emotional responses to the BBL ecosystem. It consisted of five statements, each having a possible range in scores from strongly disagree to strongly agree (coded 1 through 5, respectively). The attitude items measured: fragility of the resource, closure of areas from public use, impacts of non-native species, multiple-use management practices, and performance levels of the USFS. Attitude items were averaged for each canoeist, but no alpha coefficients were calculated since the scale only consisted of five items. The knowledge test measured the amount of information visitors knew about the natural history of BBL. This section contained five questions and was scored in a multiple choice format (true, false, or I don’t know, but coded 1 = right or 0 = wrong/don’t know). Canoeists were asked two questions about wildlife, two concerning water resources, and one over human settlement in the area. Each item was addressed by the naturalist during the interpretive talk. Knowledge items were summed to create an overall score (Five meant perfect knowledge).

Canoeists in C2 and T2 were asked about the naturalist conducting the program. Sylvia et al. (1995) measured some attributes of nature-based education programs and found that visitors rated knowledge, enthusiasm, and communication skills of the instructors as very important. These characteristics were included in the survey. In addition, five more items were listed: organizational skills, teaching ability, professionalism, grooming/appearance, and concern over water safety. Each item was scored from 1 through 5 (from least to most important) and averaged to form a composite score. The alpha coefficient was 0.864.

In addition, visitors were asked several questions about fee-based interpretation. Three questions measured participants’ beliefs about USFS user fee policies (whether programs should be free, what to do with the revenue, and amount of trust they placed in the agency). Each item was scored separately, using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The item, “I believe that interpretation programs in the Forest Service should be free” was reverse-coded. A composite score consisting of responses to USFS fee policies was used for testing purposes.

Lastly, demographic questions included age, race, gender, primary residence, and zip code. Other information requested was travel distance, number of times visiting BBL, previous attendance at fee-based interpretive programs, and how much they paid for these services.

Data Analysis
The Statistical Package for Social Sciences (SPSS) was used for data entry and analysis. Means were calculated for each dependent variable and compared to determine if
Table 1. Demographic profile of Big Bear Lake canoeists.

<table>
<thead>
<tr>
<th>TIMING</th>
<th>self-guided (rental)</th>
<th>naturalist-led (profit)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>age:</td>
<td>age:</td>
</tr>
<tr>
<td></td>
<td>n=29; (\bar{x}=29.9); s.d.=7.11</td>
<td>n=59; (\bar{x}=42.4); s.d.=10.58</td>
</tr>
<tr>
<td></td>
<td>male:</td>
<td>male:</td>
</tr>
<tr>
<td></td>
<td>n=13; 41.9%</td>
<td>n=31; 47.0%</td>
</tr>
<tr>
<td></td>
<td>white:</td>
<td>white:</td>
</tr>
<tr>
<td></td>
<td>n=15; 48.4%</td>
<td>n=53; 80.3%</td>
</tr>
<tr>
<td></td>
<td>previous visits:</td>
<td>previous visits:</td>
</tr>
<tr>
<td></td>
<td>n=22; (\bar{x}=5.13); s.d.=5.59</td>
<td>n=56; (\bar{x}=16.3); s.d.=27.56</td>
</tr>
<tr>
<td></td>
<td>distance traveled:</td>
<td>distance traveled:</td>
</tr>
<tr>
<td></td>
<td>n=22; (\bar{x}=109.3); s.d.=60.38</td>
<td>n=56; (\bar{x}=119.2); s.d.=206.41</td>
</tr>
<tr>
<td></td>
<td>age:</td>
<td>age:</td>
</tr>
<tr>
<td></td>
<td>n=23; (\bar{x}=32.1); s.d.=8.67</td>
<td>n=67; (\bar{x}=44.7); s.d.=12.91</td>
</tr>
<tr>
<td></td>
<td>male:</td>
<td>male:</td>
</tr>
<tr>
<td></td>
<td>n=17; 60.7%</td>
<td>n=37; 44.6%</td>
</tr>
<tr>
<td></td>
<td>white:</td>
<td>white:</td>
</tr>
<tr>
<td></td>
<td>n=18; 64.3%</td>
<td>n=164; 77.1%</td>
</tr>
<tr>
<td></td>
<td>previous visits:</td>
<td>previous visits:</td>
</tr>
<tr>
<td></td>
<td>n=27; (\bar{x}=19.2); s.d.=30.86</td>
<td>n=66; (\bar{x}=15.8); s.d.=40.44</td>
</tr>
<tr>
<td></td>
<td>distance traveled:</td>
<td>distance traveled:</td>
</tr>
<tr>
<td></td>
<td>n=27; (\bar{x}=78.9); s.d.=60.11</td>
<td>n=66; (\bar{x}=77.4); s.d.=73.11</td>
</tr>
</tbody>
</table>

they were significantly different at the 0.05 alpha level. Hypotheses were evaluated using Analysis of Variance (ANOVA) and the Student–Neuman–Keuls (SNK) multiple comparison test. If groups were found to be nonsignificant, they were combined and retested using a larger sample size. This procedure not only increased the statistical power of the design, but also allowed for comparisons between naturalist-led and self-guided trips.
Results
A total of 227 BBL canoeists were surveyed (n=32 in C1; n=30 in T1, n=75 in C2; and n=90 in T2). Nonrespondent bias was minimal since nearly 100 percent of the visitors completed the questionnaires. Although participation in the experiment was voluntary, the captive nature of trips made it awkward for visitors to leave without complying. There were no complaints from respondents using this procedure.

Group and Trip Characteristics
Results from the demographic questions revealed that BBL canoeists were nearly 41 years old (x̄=40.6); female (53.4%); white (71.3%); familiar with the area (x̄=15.3 visits); about 100 miles away from home (x̄=113.71). Over 120 different zip codes were represented in the sample. In this study, participant characteristics (by trip type) were similar, but not identical. See Table 1.

Motives
The eight item motive scale was tested for possible effects. Based on results from the two-way ANOVA, both the “timing” and “structure” effects were significant (F=27.29; 1, 226 df; p<0.001 and F=10.85; 1, 226 df; p<0.001, respectively). This means the expectations of canoeists were significantly different from the benefits obtained (x̄=3.74 and x̄=4.23, respectively). Furthermore, the scores of self-guided canoeists (x̄=3.78) were significantly different from those taking naturalist-led trips (x̄=4.08). See Table 2.

A one-way ANOVA was used to test the relative effectiveness of self-guided trips (C1 & T1) versus those led by a naturalist (C2 & T2). The overall effect was significant (F=18.38; 3, 226 df; p<0.001). The SNK procedure revealed that C1 (x̄=3.61) was not significantly different from C2 (x̄=3.80). In other words, participants had similar expectations about canoeing, despite paying different amounts for their trips. Treatment 1 (x̄=3.96) was significantly different from C1 and T2 (x̄=4.32) was significantly different from C1 and T1. This means two effects were produced, one by the trip and another by the naturalist.

Attitudes
Attitude scores were compared to determine if the main effects were significantly different from each other. Two-way ANOVA showed that “timing” was nonsignificant (F=0.443; 1, 218 df; p=0.506), but “structure” was statistically significant (F=6.579; 1, 218 df; p=0.011). In other words, canoeists had similar attitudes about BBL before and after the trips (x̄=3.93 and x̄=4.00, respectively). However, visitors’ attitudes were influenced more during naturalist-led trips (x̄=4.09), than self-guided ones (x̄=3.94). See Table 2.

Knowledge
Participants’ knowledge of the BBL ecosystem was significantly related to trip “timing” (F=65.746; 1, 226 df; p<0.001) and “structure” (F=126.992; 1, 226 df; p<0.001). Logically, knowledge scores about BBL should increase as a result of attending the interpretive program, but not for self-guided canoeists since they were not exposed to any information. To test this assumption, one-way ANOVA was used to determine if the naturalist had a significant effect beyond any possible influences of the trip. In other words, all cells were compared simultaneously. The overall effect was significant (F=121.51; 3, 226 df; p<0.001). The SNK procedure revealed that C1 (x̄=1.09) was no different from T1
Table 2. Summary of visitor benefits resulting from canoe trips on Big Bear Lake.

Table 2. Summary of visitor benefits resulting from canoe trips on Big Bear Lake.

<table>
<thead>
<tr>
<th>TIMING</th>
<th>self-guided (rental)</th>
<th>naturalist-led (profit)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>motives (expectation): n=32; ( \bar{x}=3.61 ); s.d.=0.661</td>
<td>motives (expectation): n=75; ( \bar{x}=3.80 ); s.d.=0.505</td>
</tr>
<tr>
<td></td>
<td>attitude: n=28; ( \bar{x}=3.83 ); s.d.=0.475</td>
<td>attitude: n=72; ( \bar{x}=3.97 ); s.d.=0.469</td>
</tr>
<tr>
<td></td>
<td>knowledge: n=32; ( \bar{x}=1.09 ); s.d.=0.928</td>
<td>knowledge: n=75; ( \bar{x}=1.70 ); s.d.=1.313</td>
</tr>
<tr>
<td></td>
<td>benefits (satisfaction): n=30; ( \bar{x}=3.96 ); s.d.=0.798</td>
<td>benefits (satisfaction): n=90; ( \bar{x}=4.32 ); s.d.=0.456</td>
</tr>
<tr>
<td></td>
<td>attitude: n=30; ( \bar{x}=3.84 ); s.d.=0.426</td>
<td>attitude: n=89; ( \bar{x}=4.06 ); s.d.=0.444</td>
</tr>
<tr>
<td></td>
<td>knowledge: n=30; ( \bar{x}=1.20 ); s.d.=1.064</td>
<td>knowledge: n=90; ( \bar{x}=4.20 ); s.d.=0.889</td>
</tr>
</tbody>
</table>

\( \bar{x}=1.20 \), but T2 (\( \bar{x}=4.20 \)) was significantly different from both C1 and T1. This means that self-guided canoeing produced an insignificant amount of learning, but the naturalist had a profound effect on visitors’ knowledge scores. The “timing” effect was confounded by the fact that C2 canoeists had more knowledge about BBL than those in C1 (\( \bar{x}=1.7 \) and \( \bar{x}=1.09 \), respectively). See Table 2.

Perceptions of the Naturalist
Canoeists in C2 and T2 were asked about the naturalist who conducted their programs. Self-guided participants were excluded from this analysis since they had no contact with the naturalist. There was a significant difference between the control and treatment groups (\( F=9.42; 1, 164 \) df; \( p=0.0025 \)). This means that perceptions of the naturalist improved as a result of familiarity (\( \bar{x}=4.46 \) to \( \bar{x}=4.73 \), respectively). See Table 3.
Participants were asked three questions about USFS fee policies and the composite score was used for testing purposes. Two-way ANOVA showed no significant differences due to the “timing” effect ($F=0.617; 1, 212 \text{ df}; p=0.433$). This means the act of canoeing made no difference on how participants felt about USFS fee policies. However, the “structure” effect was significant ($F=10.26; 1, 212 \text{ df}, p<0.002$), meaning that the trips were different from each other on this issue. Therefore, participants in the naturalist-led trips were more supportive of USFS fee policies than self-guided canoeists. The scores were $\bar{x}=3.86$ and $\bar{x}=3.57$, respectively (Table 3).

### Discussion of Results

Whenever possible, field experiments should be used to test the relative effectiveness of interpretive programs. If outcomes are measured, then a stronger justification for interpretation can be made to administrators. This study indicated that BBL canoe programs were highly successful, as evidenced by numerous benefits derived from this activity. Participants in naturalist-led trips scored higher on most dependent variables when compared with those in control groups. Visitor outcomes were defined as motives, attitudes, and knowledge. Agency benefits included perceptions of the naturalist and beliefs about USFS user fee policies. By offering this program, the SBNFA is helping visitors achieve greater satisfaction and generate some revenue in the process. However, these findings are suggestive, and generalizations should be made with caution.

As with any study, some limitations are present. The field experiment did not allow for pre- and post-testing, therefore changes in dependent variables are implied, but not measured. Another limitation is the inability to separate respondents who paid money

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**Table 3. Summary of agency benefits resulting from canoe trips on Big Bear Lake.**

<table>
<thead>
<tr>
<th>TIMING</th>
<th>self-guided (rental)</th>
<th>naturalist-led (profit)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>fee policies (expectation):</strong></td>
<td>n=30; $\bar{x}=3.68$; s.d.=0.580</td>
<td>n=70; $\bar{x}=3.81$; s.d.=0.581</td>
</tr>
<tr>
<td><strong>naturalist (expectation):</strong></td>
<td>n=75; $\bar{x}=4.46$; s.d.=0.053</td>
<td></td>
</tr>
<tr>
<td><strong>fee policies (satisfaction):</strong></td>
<td>n=29; $\bar{x}=3.44$; s.d.=0.818</td>
<td>n=84; $\bar{x}=3.91$; s.d.=0.528</td>
</tr>
<tr>
<td><strong>naturalist (satisfaction):</strong></td>
<td>n=90; $\bar{x}=4.73$; s.d.=0.641</td>
<td></td>
</tr>
</tbody>
</table>

**User Fees**

Participants were asked three questions about USFS fee policies and the composite score was used for testing purposes. Two-way ANOVA showed no significant differences due to the “timing” effect ($F=0.617; 1, 212 \text{ df}; p=0.433$). This means the act of canoeing made no difference on how participants felt about USFS fee policies. However, the “structure” effect was significant ($F=10.26; 1, 212 \text{ df}, p<0.002$), meaning that the trips were different from each other on this issue. Therefore, participants in the naturalist-led trips were more supportive of USFS fee policies than self-guided canoeists. The scores were $\bar{x}=3.86$ and $\bar{x}=3.57$, respectively (Table 3).
for canoe trips as opposed to those who did not (it is likely that one person to paid for another in the same family group). Those taking “free” canoe trips might answer some questions differently than paying customers. Lastly, the demographic composition varied somewhat between treatment and control groups. This difference was most apparent in C1. In general, self-guided canoeists were younger and exhibited more ethnic diversity. It is possible these (and other) variables affected the outcomes.

**Motivations**
Canoeists in C2 had higher expectations than those in C1, but the difference was not significant. Although this result is inconsistent with SET predictions, it could be a pleasant surprise for resource managers who fear that price alone will increase visitors’ expectations. The trip made a positive impact on BBL canoeists, with or without a naturalist. However, the motive/benefit scores of naturalist-led trips were significantly higher than what self-guided canoeists reported. The largest effect was produced by the naturalist after the canoe trip was completed (T2). These findings underscore the importance of active involvement and personal service during interpretive programs. This result is consistent with theorizing since canoeists who reported the greatest benefits also paid the most money. Another plausible explanation is rationalization (Manning, 1999). Perhaps T2 canoeists did not want to admit dissatisfaction since many paid $18.00 for the trip.

**Attitudes**
From an agency perspective, attitudinal change is a desirable outcome of interpretive programs since persuasive communication is often used by natural resource managers. The naturalist had a positive effect on canoeists’ attitudes as revealed in the control ($\bar{x}$=3.94) and treatment ($\bar{x}$=4.09) groups. This difference could be the result of visitors hearing and processing the information presented by the naturalist. If so, SET predictions would be supported. However, this effect is not particularly strong since the attitude scores only increased by 0.15 points. More than likely, this finding is a result of unequal sample sizes. The act of canoeing made an insignificant effect on the attitude scores of C1/T1 participants ($\bar{x}$=3.83 and $\bar{x}$=3.84, respectively).

**Knowledge**
Canoeists arrived at BBL with different knowledge levels. Statistically speaking, it would have been better if participants scored similar on these items. Yet, this result was understandable since recreationists paying $18 for the trip probably knew more about the area than those just renting a canoe for the afternoon. Apparently, the most knowledgeable visitors (C2 and T2) wanted additional information about BBL and were willing to pay for it. Since knowledge levels were different before the trips, each treatment was tested against its control group. Self-directed canoeists made no appreciable gains in knowledge (0.11 points), but both the naturalist-led group improved their scores significantly (2.5 points). Both of these results were consistent with SET.

**Perceptions of the Naturalist**
Canoeists in C2 and T2 were asked about expectations of and satisfaction with the naturalist conducting their interpretive programs. Expectations of the naturalist were high ($\bar{x}$=4.44), but impressions became even more favorable after a two-hour exposure during
the canoe trip ($\bar{x} = 4.74$). If this finding can be attributed to trip cost, then SET predictions would be supported (higher cost, greater benefits). The average expectation score in C2 was only 0.56 points away from the maximum value (five points). Normally scores in this range do not increase because of a “low ceiling” effect, but not in this case. Based on these results, participants seemed to be well pleased with the naturalist. This result could be an indicator of satisfaction with the USFS since the naturalist was wearing an agency uniform during the presentations.

**User Fees**

Since many USFS sites generate revenue from program and activity fees, it is important to measure public response to fiscal policies. If visitor beliefs about user fees could be modified by a naturalist, then a solid justification could be made for implementing fee-based, interpretive programming. In this case, visitors in naturalist-led trips yielded more positive responses than self-guided canoeists. These findings suggest that the mere presence of a naturalist can make a positive impact on visitors’ beliefs about USFS fee policies. The rationale for user fees was not discussed on naturalist-led trips. This result has some important managerial implications, including long-term financial support for the agency.

**Conclusions**

Social exchange theory assumes that most people want to balance the cost/benefit ratio. If the benefits obtained are less than expected, then dissatisfaction usually occurs. In contrast, satisfaction is normally produced when the benefits are equal to or greater than the costs of participation. For most people, the meanings of “costs” (broadly defined) and “money” (specific) are not synonymous. A positive correlation between price and expectations does not necessarily indicate a cause and effect relationship between these two variables.

In this study, SET provided a useful explanation for many of the results. Canoeists paying higher fees for trips received the most benefits (and vice-versa). Only once were the SET predictions not supported - canoeists in C1 and C2 canoeists held similar expectations about their trips. Although inconsistent with SET, this result provides some interesting evidence for managers as they contemplate the relationship between pricing strategies and visitor expectations. More research is needed to clarify this issue.

The SBNFA will continue to offer the fee-based canoeing programs, but price will likely determine who participates in the trips. If the profit margin is most important, then fees could remain at the same level. The naturalist-led canoe trip was popular and visitors reported high levels of satisfaction with this activity. However, this type of trip attracted older adults, mostly retirees. If these visitors are not repeat customers, then trip profits may be short-lived once the market has been saturated. Few families participated in the naturalist-led trips, presumably because of higher costs. In order to encourage more family-oriented participation, a price reduction is probably needed. Different outcomes will be produced, depending upon which target market SBNFA wishes to pursue.

**References**

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eted recreation facilities. *Legacy*, 6, 6-12.


Identifying the Environmental Attitudes of Iowa Businesses

Merry L. Rankin
Iowa Department of Natural Resources
Management Services Division
Wallace State Office Building
Des Moines, IA 50319
515/281-0878
515/281-6794 Fax
merry.rankin@dnr.state.ia.us

James L. Pease, Ph.D.
Department of Natural Resource Ecology & Management
124 Science II
Iowa State University
Ames, IA 50011-3221
515/294-7429
515/294-7874 Fax
jlpease@iastate.edu

Abstract
Businesses play a vital role in the balance of nature, as they use, control, and affect natural resources, wild areas, and wildlife, both directly and indirectly. This study assessed the environmental attitudes and behaviors of Iowa businesses through a 24 question environmental survey administered by mail to over 700 businesses. Results from the 316 respondents provided an understanding and awareness of Iowa business attitudes and opinions and indicated networking and partnering opportunities for interpreters and other environmental educators. Nearly half of respondents identified their businesses as having a role in providing or receiving environmental education. Certain types of industries were also more likely than others to be involved in specific types of activities and interests. Environmental attitudes of respondents were found to cluster around neutrality with a slight tendency toward being more pro-environmental. Recommendations for utilizing the potential of such educational opportunities are discussed.

Keywords
business, environmental attitudes, education, environmental concern, interpretation, environmental education
Acknowledgment

Funding for this project was provided by the Iowa Resource Enhancement And Protection--Conservation Education Program (REAP-CEP), Grant #6M.

Introduction

From the time of the first observed Earth Day in 1970, certain groups have been identified as pro- or anti-environmental. The business community is one entity that clearly has found itself labeled as anti-environmental. Though there are obvious and numerous conflicting opinions, paradigms, and viewpoints, what is certain is that businesses play a vital role in the balance of nature, as they directly and indirectly use, control, and affect natural resources, wild areas and wildlife.

Interpreters and other educators have an opportunity. Education is the way by which knowledge and skills are imparted, and few paradigm shifts or collaborative efforts in society can successfully take place without it. Research into existing paradigms yields critical information for educators, whether they are in the formal classroom environment or in the non-formal sector. Interpreters who teach the public about natural resources benefit in gaining an understanding of the attitudes of businesses with which they often seek to partner. An interpretive dictate is to "know your audience". Interpreters must seek a knowledge and understanding of business attitudes in order to enlist them either as partners or as potential audiences for education.

The climate is especially promising, at present, to conduct research relating to the environmental attitudes of businesses and the opportunities that exist for educational partnering with them (Zimmer, et al, 1994). Five factors support this:

1. Firms are beginning to differentiate themselves on the basis of environmental concern.
2. The media has focused attention on "green" issues both as a part of routine news reporting and as feature stories.
3. Environmental issues have become part of political platforms in speeches and campaigns.
4. Special interest groups have highlighted the relationship between environmental concern and consumption.
5. Consumers have expressed concern about protecting the environment via public opinion polls, participating in recycling programs, and using environmentally friendly products.

Although Iowa is not considered an environmentally fragile state, quite the opposite is true. Because of its vast richness and fertility, Iowa has one of the most ecologically altered landscapes in the nation. Over 95 percent of its acres having been converted from its natural state prior to Euro-American settlement (Iowa Farm Bureau Federation, 1997). This includes alteration of over 95 percent of Iowa's natural wetlands (Bishop, 1981) and over 99 percent of Iowa's native prairies (Samson and Knopf, 1994). Additionally, over 95 percent of Iowa's land is also privately owned (U.S. Bureau of the Census, 1997). Many other agricultural states find themselves in similar situations. Considering current political issues involving private land rights and ownership and their impact on environmental regulation and legislation, the fate of Iowa's natural resources and wildlife is vitally dependent upon an understanding and collaborative effort between all interest groups. Similar concerns and considerations are applicable to many states and regions.
More than three decades ago, James Swan argued that, “at the root of the ecological crisis are the basic values which have built our society” (Swan, 1971, p. 225). In other words, those things upon which we place value and make priorities as a society, are also the basis of our environmental problems and concerns. Over much of the world, the market economic system operates to satisfy these basic values. Understanding that system and the values that underlie it are critical to finding solutions to environmental issues.

Having profited well in the deregulated marketplace, businesses often see environmental awareness and activism as a threat to growth, innovation, and free market activity. This thinking is not totally unfounded. The reaction to environmental lobbying has been an increase in regulation and compliance standards for businesses. An understandable prejudice by business people against environmentalism has emerged (Hawken, 1993). Regulations target both specific industries (manufacturing, service, etc.) and processes or functions that a company might perform (waste disposal, transportation, etc.) and are seen as threatening profitability and competitive advantage (Steiner and Steiner, 1994).

At the same time, economic valuation has brought new meaning and includes certain externalities, such as wildlife and other natural resources. Consumers are increasingly demanding more environmentally-friendly products and processes. The struggle has become how to balance society’s growing desire for environmental protection with businesses’ economic burdens of environmental compliance. The attitudes that businesses bring to this struggle help shape reactions by other societal groups and impact the approaches that educators can take.

In an attempt to understand business attitudes in this arena, a continuum for environmental attitude adoption was described by Milbrath (1984). The two extremes of this adoption curve consist of groupings known as "vanguard-oriented" (early adopters/environmentally concerned) and "rearguard-oriented" (laggards/non-environmentally concerned). Those within the vanguard-oriented group tend toward proactive environmental attitudes and activities including specific budgeting for pro-environmental business practices, life cycle cost analysis, producer responsibility, and the valuation of externalities. Those within the rearguard-oriented group tend toward reactive environmental attitudes and activities including deregulation, free market activity, status quo, and production cycle cost analysis. It is between these two extremes that businesses have fluctuated and cycled.

The role of education and interpretation
Most educational research that has been performed in the area of environmental concern and behavior has been limited to students in formal educational environments. Existing studies have been concerned with whether environmental education (EE) produces an effect on students’ level of concern and subsequent behaviors in pre- and post-test situations (Swan, 1971; Towler and Swan, 1972; Cohen, 1973; Asch and Shore, 1974).

In the 1980s and ’90s, with concerns regarding environmental degradation and the subsequent emergence of strong consumer activism and concerns of “greening” for business, student-centered research took a new turn as studies began to specifically consider the environmental attitudes and behaviors of business students.

both decades, however, business curricula were found to be largely devoid of environmental issues and values (Behrman and Levin, 1984; Synodinos, 1990; Barnes and Ferry, 1992). Some studies went further to compare the shift, if any, of environmental attitudes and values of business students after taking an environmental course. Results from these indicated that attitudinal as well as behavioral change could result, even from a single class (Benton, 1993).

Some studies in Iowa have been conducted involving businesses and their involvement with and attitudes toward the environment (Selzer-Boddy, 1996; Waste Reduction Center, 1992). However, none of these studies have directly asked businesses about their involvement in or attitudes toward EE, rather, they gauged non-business perceptions of business. No Iowa studies have specifically targeted business and industry as the respondents.

**Purpose of this Study**

This project focused on identifying the attitudes of Iowa businesses toward the environment and environmental education. A proposal for this research was presented to the Environmental Committee of the Iowa Association of Business and Industry and fine-tuned according to their recommendations and concerns (Iowa Association of Business and Industry, personal communication, May 15, 1996). The following four study objectives were the focus of this research:

1. How do Iowa businesses view their role in environmental education?
2. What general attitudes do Iowa businesses have about the environment?
3. What environmental issues do Iowa businesses consider priorities?
4. Are there any demographic factors that contribute to how Iowa businesses view environmental education, attitudes, and priority issues?

**Methodology**

**The participants**

Participants were chosen based upon two-stage cluster sampling. Clusters were identified by standard industrial classification (SIC) codes, obtained from the American Business Disc CD ROM series (1997). Twenty-eight codes were chosen from which to gather the population for sampling based upon consultation with the Iowa Waste Reduction Center, a non-profit operations consultant serving Iowa businesses, and the Iowa Association of Business and Industry Environmental Committee. Business codes were chosen that best represented firms impacted by compliance requirements.

A random sample was drawn from each code population that identified study participants. Due to the extreme variation in the number of code members between codes, a proportional sample was drawn from each code which represented that group’s population proportion to the total population. A total of 703 Iowa businesses made up the collective study sample.

Respondents were those responsible for environmental decision-making within the company. The majority were CEOs and middle-managers, though some surveys were completed by public relations or sales employees. Companies represented were typically Iowa-based and ranged in size from companies of fewer than 100 employees to those with more than 1,000. The typical respondent was in the 40-49 years-old age range and had at least some college education.
The survey instrument

A 24 question Iowa business and industry environmental survey was administered to the sample. The respondents were asked to answer the survey questions as a representative of their organization, not according to their personal beliefs or ideals.

The survey consisted of 24 demographic, Likert-type scale (Likert, 1957), true/false, and open-ended questions. It was reviewed, revised, and pilot tested by individuals representing both academia and business. The questions served to profile the respondent in relation to age, educational level, and environmental attitudes and behavior, as suggested in previous research (Van Liere and Dunlap, 1981; Hines, et al, 1986).

The Likert-type scale and true/false questions gauged environmental attitudes, behaviors, and concerns. These questions were based on a compilation of the work of Dunlap and Van Liere (1978), Albrecht et al. (1982) and Maloney, et al (1975).

Open-ended questions were used to identify issues that Iowa businesses felt defined their environmental concerns.

We used a modified Dillman technique (Dillman, 2000) consisting of an initial complete survey mailing with cover letter, followed two weeks later with a reminder postcard. After four weeks another complete survey mailing was sent with a reminder letter to non-respondents. Summary statistics were performed on survey data via Microsoft Excel 4.0 (Microsoft Corporation, 1993). Principal component analysis was completed on the data using SPSS Advanced Statistics 6.1 (SPSS, Inc., 1994).

Results

A total of 316 usable surveys were returned, a return rate of 47 percent after undeliverables were removed. Although survey respondents represented a variety of businesses and industry types, small numbers in some SIC categories made descriptors unreliable. Therefore, all respondents were grouped into one of three industry categories: manufacturing, service, and utility. Though most of the survey respondents (62 percent) represented a manufacturing business, a significant representation of both utility and service was also present (Table 1).

Table 1. Types of businesses participating in the survey
(N = 316)

<table>
<thead>
<tr>
<th>Business Type</th>
<th>Sample Size</th>
<th>Return Frequency</th>
<th>Return Percentage</th>
<th>Sample Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Businesses</td>
<td>703</td>
<td>316</td>
<td>45(^1)</td>
<td>100</td>
</tr>
<tr>
<td>Manufacturing Businesses(^2)</td>
<td>558</td>
<td>197</td>
<td>35(^1)</td>
<td>62</td>
</tr>
<tr>
<td>Utility Businesses(^3)</td>
<td>70</td>
<td>61</td>
<td>87(^1)</td>
<td>19</td>
</tr>
<tr>
<td>Service Businesses(^4)</td>
<td>75</td>
<td>56</td>
<td>75(^1)</td>
<td>18</td>
</tr>
<tr>
<td>Other Businesses</td>
<td>NA</td>
<td>2</td>
<td>NA</td>
<td>1</td>
</tr>
</tbody>
</table>

\(^1\)When unusable surveys are excluded, the adjusted return rate is 47%.

\(^2\)Manufacturing businesses include plastic, fabricated metal, paper and paperboard, chemical, medical, food, agriculture, and construction.

\(^3\)Utility businesses include electric, water and gas.

\(^4\)Service businesses include refuse, landfills, transportation, and repair/job shops.
Although manufacturing industries had the largest number of respondents, they also had the lowest response rate of 35 percent, compared to 87 percent and 75 percent, respectively, from utility and service industries. No analysis of non-respondents was attempted.

**Attitudes About the Environment**

Fifteen Likert-type statements were included in the survey to gauge environmental attitudes of Iowa businesses. Respondents placed their reactions on a five-point scale with 1 being “strongly agree” and 5 being “strongly disagree.” Through principal component analysis, “vanguard-oriented” (environmentally concerned) or "rearguard-oriented" (not environmentally concerned) responses could be identified (Milbrath, 1984). The statements that corresponded to each of these orientations are noted below.

Vanguard-oriented respondents tended to agree with the following statements in the survey:

- Businesses need to spend more money on environmental protection.
- Environmental protection should be seen as part of the "bottom line".
- Spending additional money on environmental protection is worth sacrificing some future capital investments.
- Business leaders are important components to further environmental protection.
- Businesses should include the value of externalities (i.e. natural resources and wildlife) in accounting practices.

Rearguard-oriented respondents tended to agree with the following statements in the survey:

- Too much emphasis is currently being placed on environmental issues.
- Environmental problems will be solved through the free enterprise system.
- Government regulations regarding environmental protection are too restrictive.
- Businesses really don’t upset the balance of nature.
- Businesses have the right to modify the natural environment to provide products and/or services to consumers.
- Businesses are doing all they can to reduce pollution.

Table 2 summarizes the frequencies of respondents in each category for the vanguard and rearguard orientation. As Table 2 illustrates, Iowa businesses tended strongly toward neutral-

---

### Table 2. Business vanguard and rearguard orientation (N=316)

<table>
<thead>
<tr>
<th>Strength of Agreement</th>
<th>Vanguard&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Rearguard&lt;sup&gt;3&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Agree</td>
<td>44</td>
<td>16</td>
</tr>
<tr>
<td>Neutral</td>
<td>209</td>
<td>120</td>
</tr>
<tr>
<td>Disagree</td>
<td>51</td>
<td>156</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>Total (N = )</td>
<td>312</td>
<td>311</td>
</tr>
<tr>
<td>Mean Score</td>
<td>3.35</td>
<td>2.82</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.58</td>
<td>.63</td>
</tr>
</tbody>
</table>

Total N does not equal 316 due to non-responses.

<sup>1</sup> Strength of agreement score is based upon a range of 1-5, with 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree.

<sup>2</sup> Vanguard attitude corresponds to strength of agreement to survey questions identified as vanguard-oriented through principal component analysis.

<sup>3</sup> Rearguard attitude corresponds to strength of agreement to survey questions identified as rearguard-oriented through principal component analysis.
ity on these questions, shifting slightly toward vanguard attitudes, but not strongly so.

A further understanding of Iowa business attitudes was accomplished by considering the size of a firm and the type of industry it represented in relation to vanguard or rearguard orientation. No relationship was found between the type of industry (manufacturing, service, or utility) and vanguard or rearguard orientation. Some differences were noted:

- Small firms (1-100 employees) tended to have a more vanguard orientation.
- Large firms (over 501 employees) tended to have a more vanguard orientation.
- Though predominantly vanguard, both large and small firms had a few representatives that were rearguard oriented.
- Medium firms (101-500) were equally mixed between vanguard and rearguard orientations.

**Business’s role in environmental education**

A definition of environmental education was provided to the survey respondents to reduce the possibility of bias through individual interpretation and definition. The definition was taken from the Statewide Environmental Education Development Strategy (SEEDS) legislation proposed for the state of Iowa (Iowa Association of Naturalists and Iowa Conservation Education Council, 1994, p. 2).

“Environmental education is the process of providing information and/or experiences that create an awareness and develop a base level of understanding of basic ecological principles, humanity’s relationship to and impact upon these principles, and the tradeoffs that result in working toward environmental sustainability.”

Based on that definition, 44 percent (N = 139) of Iowa businesses surveyed felt they provided environmental education to some audience (Table 3). Environmental education was provided to internal and external audiences in approximately equal proportions. However, businesses were more likely to use internal methods (employee seminars and publications) rather than external methods (public service projects, community projects, and school projects).

Overall, 52 percent of businesses reported receiving environmental education from sources outside their company. Nearly the same number of respondents noted that their

| Table 3. Businesses providing or receiving environmental education (EE) (N=316) |
|-------------------------------------------------|------------------|
| Frequency | Percentage |
| EE provided to audiences | 139 | 44% |
| EE provided to internal audiences¹ | 84 | 27% |
| EE provided to external audiences² | 85 | 27% |
| EE provided by internal methods³ | 91 | 29% |
| EE provided by external methods⁴ | 17 | 5% |
| EE received from outside sources | 164 | 52% |
| EE received from personal sources⁵ | 252 | 80% |
| EE received from non personal sources⁶ | 247 | 78% |

Frequencies sum to >316 due to multiple answers.

¹Internal audiences include employees.
²External audiences include students, other businesses, the general public, and customers.
³Internal methods include employee seminars and publications.
⁴External methods include public service projects, community projects and school projects.
⁵Personal sources include suppliers and vendors, educational opportunities and the Trade Association Technical Assistance Program.
⁶Non-personal sources include government publications, publications from other businesses and scientific journals.
business received environmental education from personal sources (suppliers, vendors, educational opportunities, etc.) and non-personal sources (government publications, publications from other companies, scientific journals, etc.) (Table 4).

Further analysis, involving the type of industry and EE provided and received showed the following:

• Businesses in the utility category were more likely than either manufacturing or service industries to provide EE to external audiences.

• Service-related businesses were more likely than manufacturing to provide EE through external means.

• Utility and service industries were more likely to provide some sort of EE than manufacturing, regardless of the audience or methodology.

• Utility-related businesses were more likely to receive non-personal sources of EE and to provide environmental education to external audiences than either manufacturing or service industries.

Environmental issue priorities
Respondents were asked to list and rank (in order of importance) three environmental issues they saw as priorities for their business in the next decade. Thirteen issues were identified by 78 percent of the survey respondents. Their weighted scores and ranks appear in Table 5. The top three issues, in order of importance were: waste management, air, and water. A few companies (1 percent) noted that the question was not applicable to them and that there were no environmental issues that would be of concern to them in the next decade.

Demographic factors
Some demographic factors and environmental attitudes showed significant but weak correlation. Environmental education being provided by a business is correlated with a more highly educated respondent (r=.12, p<.05) and with greater total number of employees (r=.22, p<.05).
Discussion
Three topics emerge that are of primary interest to interpreters. These include: the involvement of businesses in environmental education; the distinction between vanguard and rearguard environmental attitudes of businesses; and the specific environmental issues identified by businesses as business priorities.

This baseline research indicates that many businesses are including some type of education about environmental matters in their business operations. This is partly due to the sample being drawn from businesses most likely to have some environmental compliance issues. Whether such education is in reaction to compliance or represents a more altruistic environmental attitude, it is occurring. While both positive and negative environmental orientations exist in the business community, most are neutral to slightly vanguard-oriented on environmental topics. Finally, it also shows that while the environmental priorities of businesses often revolve around issues of compliance with various environmental laws, other educational concerns do surface.

These data do not show overwhelming support for EE in Iowa businesses; however, we believe that as baseline data they suggest an interest and openness of businesses for EE. The bell-shaped curve of responses to attitudinal questions on the survey shows that businesses are not nearly as reactionary as some might want us to believe. It is evident that Iowa businesses, like the general public, are becoming more aware and receptive to environmental issues, responsibilities, and their role. This should signal to educators that businesses are at least somewhat familiar and experienced with EE and might be potential partners in EE and potential audiences.

We had concern in conducting this study that businesses might give us canned responses. That these responses represent moderate environmental awareness and receptiveness rather than overwhelming embrace or rejection of EE, minimizes this concern. To be sure, businesses are no different than other segments of society, including educators: they act in their own self-interest. But, again like other societal segments, many realize that their future productivity and profit are linked to the health of natural resources. To have healthy busi-

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**Table 5. Business environmental priorities of the next decade (N=316)**

<table>
<thead>
<tr>
<th>Environmental Issue</th>
<th>First Priority</th>
<th>Second Priority</th>
<th>Third Priority</th>
<th>Weighted Score 1</th>
<th>Overall Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Management</td>
<td>174</td>
<td>66</td>
<td>20</td>
<td>260</td>
<td></td>
</tr>
<tr>
<td>Air (pollution, quality, etc.)</td>
<td>129</td>
<td>72</td>
<td>11</td>
<td>212</td>
<td></td>
</tr>
<tr>
<td>Water (pollution, quality, etc.)</td>
<td>132</td>
<td>66</td>
<td>12</td>
<td>210</td>
<td></td>
</tr>
<tr>
<td>Regulation and Compliance</td>
<td>126</td>
<td>48</td>
<td>16</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td>Public Relations</td>
<td>66</td>
<td>24</td>
<td>13</td>
<td>103</td>
<td></td>
</tr>
<tr>
<td>Recycling</td>
<td>39</td>
<td>32</td>
<td>8</td>
<td>79</td>
<td></td>
</tr>
<tr>
<td>Pollution (general)</td>
<td>24</td>
<td>14</td>
<td>4</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Natural Resources</td>
<td>12</td>
<td>12</td>
<td>8</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td>9</td>
<td>14</td>
<td>2</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Public Health</td>
<td>6</td>
<td>12</td>
<td>5</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>3</td>
<td>10</td>
<td>4</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Environmental Improvement and Innovation</td>
<td>3</td>
<td>6</td>
<td>4</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>NA/None</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

1Weighted scores are based upon an arbitrary rating system for issues in which an issue of priority one gets a weight of three, priority two gets a weight of two and priority three gets a weight of one. These weights are multiplied times the frequency of the issue for the weighted score and then all weighted scores are summed for the overall score.
nesses and communities in the future, many businesses realize they must be stewards of the resources that sustain them.

This was further illustrated in our findings regarding business’s vanguard or rearguard orientation. Although our findings found evidence of both of these extremes, a majority of respondents fell within neutral to slightly vanguard orientation. This is important to note as it identifies a “potential target area” for partnership, awareness, and networking that until now has often been assumed to be non-existent. All those in education and interpretation know that there are those audiences that are receptive to environmental messages and those that are very resistant. While our findings also recognize this, we believe it shows that there is another audience that has interest in and is at least somewhat receptive to environmental messages and education.

Interpreters and other non-formal educators are in excellent positions to be leaders in an effort to bring business more fully into EE. For the most part, those in interpretation and education represent neutral ground. If they approach issues and concerns in the appropriate manner, they will not be considered by business as adversaries with predetermined agendas. Unlike some agencies whose focus is often regulation and compliance, those in education have a chance to dialog with business.

Now the challenge is to reach businesses where their interests and concerns lie. Know-how is more effectively transmitted by personal contact than by trade journals (Tuma, 1987). Therefore education, both formal and informal, is indispensable. This is not to say that the goals of the environmental interpreter will always be synonymous with those of business. It is to be expected that there will be differences in priorities and viewpoints and that conflicts will occur. Environmental problems and quality of life concerns are not settled once and for all; rather, they are permanent concerns and a constant challenge (UNESCO, 1988). However, if we understand the baseline data presented here, the challenge is not nearly as insurmountable as it may have seemed.

As interpreters, there is homework to be done. We believe that this study provides a small contribution and important awareness for improving the understanding of the Iowa business audience. Whether they are different than those in the rest of the country remains to be seen. We encourage others to replicate this study to determine whether this is so.

Interpreters are often in respect roles in their communities. If outreach beyond their parks and nature centers is essential to the long-term viability of those resources, then this study provides support for those wishing to extend their educational efforts to the business community. Certainly, many interpreters often seek out businesses as partners to provide important financial support for programs and activities. We suggest that there are other types of partnerships with businesses that should be considered. These include: helping businesses to provide education about the environment to their employees; using the expertise of those engaged in environmental compliance in programs for other audiences; engaging businesses and other public sectors in dialogues about environmental issues, especially waste management, air, and water quality; and forming community groups that include the business sector to address other long-term natural resource issues.

Interpreters are more than just educators in the parks and nature centers. To maximize their effectiveness, they must be active members of the communities in which they live. To the extent that this research is applicable beyond the Iowa businesses we surveyed, there appears to be an openness to education about the environment in the busi-
ness community. We believe that this receptiveness is enhanced if it comes from respected community members. Interpreters, as important environmental educators in their communities, have a unique opportunity.

**Literature Cited**


Understanding Park Visitors’ Response to Interventions to Reduce Petrified Wood Theft

Carolyn Widner Ward, Ph. D.
Associate Professor, Interpretation
Humboldt State University
Environmental and Natural Resource Sciences Department
Arcata, CA 95521

Joseph Roggenbuck, Ph. D.
Professor, Outdoor Recreation
Department of Forestry
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061

Abstract
This study examined why theft of petrified wood at Petrified Forest National Park occurred and how designed interventions worked to inhibit the performance of that behavior. This evaluation was based on semi-structured interviews with observed thieves and non-thieves. Subjective responses revealed that theft was not a thoughtless act, but instead occurred because thieves rationalized that their particular act of theft was acceptable. The primary rationalization given by thieves was that their piece of stolen wood was so small that taking it would not hurt anything. It appeared as though anti-theft messages were received by all of those interviewed, but that thieves only applied these messages to the larger pieces of wood. In addition, most thieves did not view taking a little chip as stealing. There was not one primary message from the interventions processed by respondents, but instead many different messages were received and may have been impacting behavior.

Keywords
depreciative behavior, Petrified Forest National Park, intervention effectiveness, information processing

A visitor at Petrified Forest National Park reaches down and picks up a small piece of petrified wood. After careful examination, the visitor places the wood back where it was found. A few minutes later, at the same site, a second visitor picks up a small chip of wood. After careful examination, she puts the chip in her pocket. Why did one visitor take the wood and the
other carefully replace it? Can we design interpretive interventions to stop the second visitor from taking the chip of wood? And if so, how does it stop her?

**Introduction**

Noncompliant visitor behavior, such as the theft of petrified wood, is a significant problem facing natural resource managers today. In a 1994 survey of national park superintendents, 72 percent of survey participants reported that noncompliance of rules and regulations by visitors caused significant damage to park resources (Johnson, & Vande Kamp, 1994). The managers estimated the cost to repair accumulated damage to National Park Service areas to be $79.2 billion (Johnson and Vande Kamp, 1994). The estimate of the annual costs of “fixing” resources and facilities damaged by such inappropriate behavior was $18.8 million. These costs, while high, do not include the large social and environmental costs of non-repairable resource damage. For example, once petrified wood is removed from a park or stalactites are broken in a cave, money cannot fix them. In Petrified Forest National Park in northeast Arizona, visitor removal of petrified wood is the park’s primary resource protection problem (USDI-NPS, 1992). In fact, park staff estimates that approximately 12 tons of wood is removed each year.

Considering the frequency and intensity of reported damage to parks as a result of depreciative behavior, it is surprising that so little work has been done on attempting to understand such problem behavior. The few studies that have been conducted on depreciative behavior in natural resource areas have mostly been site-specific attempts to control or reduce the performance of the behavior (Gramann & Vander Stoep, 1987; Martin, 1992; Johnson & Swearingen, 1992; Oliver, Roggenbuck, & Watson, 1985; Roggenbuck, Loomis & Dagostino, 1991). Few attempts to understand the behavior exist, and they mostly involve conjecture on what may or may not be happening based on the application of a particular theory (Roggenbuck, Loomis, & Dagostino, 1991). Consideration of how or why an intervention may or may not be working is almost nonexistent. In addition, no attempts to understand depreciative behavior in natural resource recreation areas from the perspective of those committing the acts were found.

This study was conducted as a second phase of a research project that tested three behavioral interventions’ effectiveness in reducing theft of petrified wood from Petrified Forest National Park (Widner & Roggenbuck, 2000). The primary purpose of the research presented here was to begin to develop a richer understanding of depreciative behavior. More specifically, we attempted to understand why some park visitors steal wood and how various interventions shape appropriate or inappropriate behavior. The approach we took was to look at these issues from the perspective of the park visitor.

**Background**

*Causes of Depreciative Behavior in Parks*

Most research has focused on the noncompliant behaviors of off-trail hiking (Johnson & Swearingen, 1992; Swearingen & Johnson, 1988), campsite impacts (Clark, Hendee, & Campbell, 1971; Dwyer, Huffman, & Jarratt, 1989; Fazio, 1979; Oliver, Roggenbuck, & Watson, 1985), and littering (Christensen & Clark, 1983; Clark, Hendee, & Burgess, 1972; Iso-Ahola & Niblock, 1981; Muth & Clark, 1978). Only two studies in recreation and leisure sciences literature were found that dealt with the theft of a resource and the subsequent attempts to reduce that behavior (Martin, 1992; Widner, & Roggenbuck, 2000).
When examining the published literature regarding why people perform depreciative behavior, three general philosophies or approaches emerged. Although these three approaches are not mutually exclusive, we will discuss them separately and identify some of the possible linkages where they exist.

**Failure to Comply with Social Norms.** One general approach to explain why visitors perform depreciative behavior concerns failure to comply with social norms (Gramann & Vander Stoep, 1987; Heberlein, 1972; Samdahl & Christensen, 1985). Social norms are widely accepted shared beliefs about what behaviors are right or wrong in a given situation, and depreciative behavior could be considered as a violation of those norms.

Gramann and Vander Stoep (1987) developed taxonomy of six norm violations. Some deviant behavior is “unintentional” and occurs because visitors are unaware of norms. Many others have agreed with this lack of “norm salience” or “knowledge” as a primary source of deviant behaviors (Gramann, Christensen & Vander Stoep, 1992; Higgens, 1992; Martin, 1992; Oliver, Roggenbuck & Watson, 1985). A second category of depreciative behavior occurs because of conditions in the environment that promote or “cue” the depreciative behavior. In other words, the “releasor-cue” of seeing depreciative behavior stimulates the emergence of an otherwise inhibited behavior. A third reason for normative violations is that visitors may not know the consequences of the behavior or, as Gramann and Vander Stoep (1987) called it, are “uninformed violators”. In this case, visitors may know of the general rule or the norm for behavior but may not see its applicability to a particular act in the context of their visit to the park. Several studies have examined this idea that visitors may be performing noncompliant behaviors because of a lack of awareness of the consequences of the behavior (Christensen & Clark, 1983; Heberlein, 1972; Oliver et al., 1985; Schwartzkopf, 1984). Some visitors that violate an existing norm may do so because they feel that, in their particular case, the violation is justified. Gramann & Vander Stoep (1987) called these “responsibility-denial” violators. The fifth reason visitors may violate the norm is because of peer pressure, or as Gramann & Vander Stoep (1987) called it, “status-confirming” violations. These visitors are motivated to perform noncompliant behavior to conform to or please their referent group. In fact, one review of vandalism suggested that a majority of depreciative behaviors occur as a direct result of group action (Vliet, 1992).

Gramann & Vander Stoep (1987) distinguished all of the above behaviors as deviant and different from their sixth type of violation, which they called vandalism or “willful” violations. This type of violation could be motivated by financial gain, ideological protest, revenge, malice, or fun. These violators are “fully aware that their actions are wrong, yet they persist because they are pursuing goals that are in fundamental conflict with the goal of resource protection” (p.250).

**Goal Driven Depreciative Behavior.** The idea that goals somehow influence or even cause depreciative behaviors is the second major approach taken in the literature to understand why visitors perform noncompliant behavior. Knopf and Dustin (1992) outline the motives behind depreciative behavior and vandalism in natural resource areas as a product of goals or needs. They contend that, “vandalism and depreciative behavior is need-driven behavior; it is neither senseless nor meaningless” (p.233).

There are three basic needs that, they suggest, promote the performance of depreciative behavior. One is the need for equity. This view contends that depreciative behavior results when rules or regulations are deemed unfair or unjust. Thus, when breaking the
rule, visitors are attempting to fulfill the need for equity. This could easily be related to Gramann & Vander Stoep’s (1987) category “responsibility-denial” violations, where the visitor deems the rule unfair in their particular circumstance.

The second need they identify as driving depreciative and vandalistic acts is the need for competence. One aspect of this need may manifest itself in acts that demonstrate the individuals’ control over themselves above and beyond what any rule may say. A second aspect of this need may be the performance of a depreciative act to gain status or support from a referent group. This can be easily linked to Gramann and Vander Stoep’s (1987) “status-confirming” violators. Here, the group norm may serve to promote the depreciative behaviors.

A third need that drives much of the depreciative behavior in natural resource areas is arousal. Much of the literature on vandalism and depreciative behavior points to the role of entertainment or fun as a motivating force (Clark, Hendee & Campbell, 1971; Oliver et al., 1985). Gramann & Vander Stoep (1987) included fun as a motivating force promoting “willful” violations.

Tragedy of the Commons. A third general approach articulated in the literature concerning why depreciative behavior occurs was first discussed by Hardin (1968) in his “Tragedy of the Commons” paper. This general view contends that depreciative behavior occurs in recreation areas because of basic human characteristics and common sense (Gramann, Christensen, & Vander Stoep, 1992; Meine, 1995; Vande Kamp, Johnson, & Swearingen, 1994). For example, the benefit from taking a chip of petrified wood accrues to the individual, while all the visitors share the cost of one less piece in the park. In other words, it makes intuitive sense to the individual that the benefit of taking the wood is greater than the cost which is shared by everyone. This view contends that there is, in fact, a natural tendency for people to behave in this manner. As with the previous discussion, this view of depreciative behavior can also be linked to the approaches presented above. For example, this approach could simply be viewed as the expression of a need to acquire benefits for the individual over what any rule may say about the costs for others, and thus linked to Knopf and Dustin’s (1992) discussion of need’s driven behavior.

In addition to the above perspectives on depreciative behavior, the fields of social psychology, psychology, and sociology have much to offer in understanding the causes of depreciative behavior. For example, attitude and attitude-activation theories (Fishbein & Ajzen, 1975; Johnson & Swearingen, 1992; Vincent & Fazio, 1992) and moral reasoning theories (Christensen & Dustin, 1989; Kohlberg, Levine, & Hewer, 1983) have been used to understand and explain depreciative behavior in natural resource areas.

Controlling Depreciative Behavior in Parks

The second key question we addressed in this study is how and why behavioral interventions work to reduce depreciative behavior in parks. In past research, atheoretical experimental or quasi-experimental field tests have been used to look at similar, but slightly different interventions. Social-psychological, sociological, and psychological theories of persuasion and behavior change have also been used as a foundation for studying this phenomenon. Methods of influence tested include interpretive signs with various text messages (Martin, 1992; Johnson & Swearingen, 1992; Widner & Roggenbuck, 2000), symbolic signs (Swearingen & Johnson, 1988), verbal messages (Vander Stoep & Gramann, 1987), signed petitions (Iso-Ahola & Niblock, 1981; Widner & Roggenbuck,
Results of depreciative behavior studies in recreation areas indicate successful intervention can occur through education or the simple conveyance of the desired behavior (Christensen, 1986; Knopf & Dustin, 1992; Oliver et al, 1985; Swearingen & Johnson; 1988; Vander Stoep & Gramann, 1987) and activating feelings of moral responsibility (Gramann & Vander Stoep, 1987; Heberlein, 1972). Promising rewards or threatening sanctions (Martin, 1992; Schwarzkopf, 1984; Widner & Roggenbuck, 2000), making visitors aware of the negative consequences of the behavior and their responsibility for those consequences (Christensen & Clark, 1983; Heberlein, 1972; Johnson & Swearingen, 1992; Widner & Roggenbuck, 2000), and exposing visitors to uniformed personnel (Oliver et al. 1985; Samdahl & Christensen, 1985; Widner & Roggenbuck, 2000) were also found to be effective in deterring minor acts of depreciative behavior.

While there have been site-specific tests of intervention effectiveness in reducing or controlling depreciative behavior, given the variability of studied behaviors, the myriad of intervention techniques tested, and the atheoretical nature of many of the studies, it is difficult to know how or why our interventions are working or not working. In addition, without subjective responses from those committing acts of depreciative behavior, we know very little about how visitors processed these interventions and why or why not subsequent behavior changed. Are our conclusions drawn from theories of depreciative behavior congruent with what is going on in the minds of those committing the acts? This research is designed to help address these issues.

Methods

Study Site and Population
The study was conducted at Petrified Forest National Park in northeast Arizona. Crystal Forest, a site along the 27-mile road that traverses the park, was chosen as the study site because it provided large supplies of accessible petrified wood, had high visitor usage, and offered places for discreet observation of behavior. The study population consisted of visitors to Crystal Forest during the sampling periods in the summers of 1995 and 1996.

Research Design
This study was conducted as part of a larger research project to test the effectiveness of a sign, a signed pledge, and a uniformed volunteer on reducing the theft of petrified wood from the park (Widner & Roggenbuck, 2000). Each of the three interventions was randomly tested for ten days during the summer of 1995. A control period was also tested for ten randomly selected days. Each sampling day ran from 7:00 am until 2:30 pm. In an attempt to gain contextual understanding of the theft act and the interventions ability to impact depreciative behavior, interviews were conducted during each of the four conditions. In order to gain an interview from at least three observed thieves during each of the four conditions, ten additional sampling days were conducted in the summer of 1996.

Data Collection
In-depth, semi-structured interviews were used to collect the data. Interviewees were purposefully sampled so that both thieves and non-thieves were interviewed during each of three interventions and the control condition. Subjective responses of individuals were
then compared. Thieves and non-thieves were selected for participation in the study through observation of their behavior. One interviewer conducted all observations of behavior and all interviews. The interviews were conducted on-site with groups or individuals and lasted anywhere from ten minutes to more than an hour. A picnic table with a shade cloth covering at the site’s parking lot was used for conducting the interviews. Interviewees were assured complete anonymity and confidentiality of responses.

All interviewees were asked three general sets of questions. The first set of questions was designed to assess how visitors construed the site. For example, visitors were asked what they remembered, liked, and thought about the site. These questions were benign and used primarily to set visitors at ease with the interview and the interviewer. The second set of questions was used to determine how the interventions might or might not be working. Visitors were asked what, if any, messages they received about things they could or could not do while in the park and what they remembered about them. The third set of questions was used to assess visitors’ general attitudes, norms, and intentions regarding petrified wood and petrified wood theft. For example, visitors were asked if they thought stealing wood was wrong, how many others they thought performed the behavior, and if they thought the wood should be protected in a park. Different content areas were probed based on each visitor’s particular response. The fourth and last set of questions was only asked of the thieves interviewed. These questions were designed to attempt to understand why visitors were taking the wood, what they may have been thinking at the time of the theft, and how they defined the act to themselves.

Data Analysis
The interviews were tape-recorded with permission and transcribed to allow for analysis. Analysis began with five readings of each interview to identify topics and themes related to why visitors took wood and how the interventions might be working. Once topics and themes were identified, a matrix of those topics that presented potential insights into the two key questions asked by this research was created. For example, one key question was why visitors steal petrified wood. To examine this issue, any comments made regarding why they took the wood were recorded. Categories were then created based on those responses, and the categories became headers for columns in the matrix. The headers for the rows in the matrix were based on the experimental condition in place during the interview. This use of a visual device to examine qualitative data is an accepted practice (Glaser & Strauss, 1973; Bogdan & Biklen, 1992).

After the creation of the matrix, interviews were reread for a potential response in each category and subsequently coded. Any additional categories or subcategories were added as needed. Following the coding of all interviews in each category, the matrix was examined for patterns or emerging themes.

Results
Of 54 non-thieves approached, 16 turned down the interview, and seven thieves of the 24 asked to participate declined. The two most common responses for declining were time constraints and not being able to speak English well enough to participate. Table 1 gives the total number of interviews conducted under each of the four experimental conditions. Results of the interviews will be discussed in two sections. Themes and con-
cepts that emerged regarding reasons for the theft of wood will be discussed first. The second section of results will examine how or why our interventions might have inhibited the theft of petrified wood in the eyes of our respondents.

**Visitor Definitions of the Theft Act**

All visitors interviewed acknowledged that taking petrified wood or large pieces of wood was wrong. In fact, it was the most consistent finding produced by the interviews. However, two primary differences emerged between thieves and non-thieves both involving the definition of the theft act. One concerned the size of the wood taken, and the second revolved around what constituted ‘stealing’ and was therefore wrong. Under all intervention conditions all non-thieves except two (95 percent) felt that taking a small chip of wood was wrong. In contrast, all thieves, except one, felt that taking a small chip of wood was not wrong (Table 2). One thief, when attempting to explain her answer that taking small chips is okay said, “Well, the little chips, like I don’t see the big thing about taking the little chips, so I would say no. But like the big things, I can understand like the big logs. If you’re gonna put it in your trunk, I can understand that.” Another thief, after confronted with the theft, stated, “well, I don’t think it’s like wrong, because, like, it’s a tiny chip, you know.” One visitor went so far as to say, “I wasn’t taking any, I just took little tiny chips.” Non-thieves, on the other hand, made statements like, “even a little chip. It’s not right,” and “to take one little flake is silly. You should buy what you want at the gift shop.” When asked if it was okay to take a little chip, another non-thief said, “No, I, I mean, where do you draw the line?”

Although the majority of thieves considered taking a small chip acceptable the reasons offered as justification varied. The three most common justifications provided by thieves were: the prevalence of wood on the site, the sentiment that everyone was doing it, and the belief that the small pieces were not important. For example, one visitor said it was acceptable to take the small chips because, “the big pieces are, like, what they’re really talking about, and (pause) the big pieces are the important pieces. Cause these little pieces, these little ones, they’d never put together a tree from it.” Another freely admitted thief stated that, “the smaller pieces are less important to the integrity of the park than the larger pieces.” Another thief stated, “it’s just a little piece, it’s not like we were coming in with a bag to take out and sell, like, we just wanted one for our pocket.”

<table>
<thead>
<tr>
<th>Experimental Condition</th>
<th>Thief</th>
<th>Non-thief</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniformed volunteer</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Pledge</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Sign</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Control</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>38</td>
</tr>
</tbody>
</table>
Another thief, after stating that she thought that about 90 percent of visitors took wood said, “I think that people should be able to take a couple little ones, I don’t think there’s any great shortage where we were, of the little ones.” In fact, 82 percent of the thieves interviewed stated that they thought most visitors did not follow the rules. Most felt much like one thief when she stated, “I think just about everybody that comes here ends up picking up a piece. If they’re anything like me.” Another visitor seemed surprised by the question and said, “Who doesn’t pick a piece of it up?” Of the 38 non-thieves interviewed, only eight (21 percent) said they thought that most visitors did not follow the rules.

The second key difference between thieves and non-thieves was their perception of what constituted stealing. Several thieves indicated that they took wood for a souvenir. When asked if buying a piece of wood from the gift shop would be the same as taking the chip from the site, most all thieves agreed that it was not the same. The reasons for this response seemed to revolve around the definition of a “real” or genuine piece of wood. One thief, when comparing the wood he could buy in the gift shop to the chip he had taken, summed it up nicely when he said, “they’re not original and mine.”

This idea of what constituted stealing was explored further by asking visitors whether or not stealing wood from the shelves of the gift shop was the same as taking wood from the site (Table 3). Again, differences emerged between thieves and non-thieves. Although these differences were not as pronounced as the differences between thieves and non-thieves on the issue of the size of the wood, it does contribute to the overall concept or theme that most thieves were not defining their act of theft as wrong. Most non-thieves (i.e., 56 percent) indicated that stealing wood from the site was the same as stealing wood from the gift shop, and 34 percent even indicated that it was worse to take it from the site. As one non-thief put it, “yeah, it would be worse because in the

<table>
<thead>
<tr>
<th>Experimental Condition</th>
<th>Percent of Thieves who said ‘Yes’ it’s wrong</th>
<th>Percent of Non-Thieves who said ‘Yes’ it’s wrong</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniformed Volunteer</td>
<td>50%</td>
<td>71%</td>
</tr>
<tr>
<td>Pledge</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Sign</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Control</td>
<td>0</td>
<td>100%</td>
</tr>
</tbody>
</table>
Table 3. Visitor responses to whether or not stealing wood from the gift shop is the same as stealing wood from the site.

<table>
<thead>
<tr>
<th>experimental condition</th>
<th>visitor type</th>
<th>yes, it is the same (N)</th>
<th>no, it is not the same</th>
</tr>
</thead>
<tbody>
<tr>
<td>control</td>
<td>thief 33% (1)</td>
<td>0</td>
<td>33% (1)</td>
</tr>
<tr>
<td></td>
<td>non-thief 60% (5)</td>
<td>40% (4)</td>
<td>0</td>
</tr>
<tr>
<td>sign</td>
<td>thief 0</td>
<td>100% (1)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>non-thief 50% (4)</td>
<td>37% (3)</td>
<td>13% (1)</td>
</tr>
<tr>
<td>pledge</td>
<td>thief 33% (1)</td>
<td>0</td>
<td>66% (2)</td>
</tr>
<tr>
<td></td>
<td>non-thief 71% (5)</td>
<td>29% (2)</td>
<td>0</td>
</tr>
<tr>
<td>uniformed officer</td>
<td>thief 50% (1)</td>
<td>0</td>
<td>50% (1)</td>
</tr>
<tr>
<td></td>
<td>non-thief 50% (4)</td>
<td>25% (2)</td>
<td>0</td>
</tr>
</tbody>
</table>

Gift shop you’re stealing from one individual business person. You’re stealing from the whole world here. It’s just not right.” Another non-thief stated, “I would feel less guilty about stealing from the gift shop.”

In contrast to responses from non-thieves, 66 percent of thieves said it was not the same to take wood from the site as it was from the gift shop and, if pressed, all but one said it was in fact worse to steal from the gift shop. This view was captured by statements like, “It would be worse to steal it in there, I would think. They put a lot of work into polishing and everything,” and, “I think it would be different because like, those are probably like the polished kind that they, like, have on, like, stands and everything, but like those little chips, like no, I don’t think so.” Many thieves, when confronted with this question, indicated that they had truly not processed their act of taking wood as “stealing” or theft. One couple, after stating that taking little chips from the site was okay, had the following interchange when asked about stealing chips from the gift shop: Male- “hmm, I guess that would be the same. What do you think?” Female- “I don’t know, it’s kind of a tough choice.” Male- “Really, means, I’m crossing myself up saying, well, smaller pieces are less important.” One visitor tried to explain the difference in terms of her mother when she said, “Well, she would understand that I like picked it up from like being in love with the petrified forest and like, I took this pebble, mom. But if I took it from the gift shop she’d be dragging me back by my ear to return it.” Two thieves became so uncomfortable with this line of questions that they asked to go on to something else.

Although there were exceptions, generally speaking, thieves were defining their act of theft in such a manner as to make the behavior acceptable. In other words, what they did was not as bad as stealing from the gift shop or taking a big piece.
Visitor Responses to Interventions

The second key question addressed by this research was how or why the interventions work to inhibit the theft of petrified wood from the park. All three interventions significantly reduced the theft rate in the park but were not significantly different from each other in effectiveness (Table 4). In an attempt to gain some insight into how and why interventions were working, subjective responses from the interviews were examined to determine what visitors thought about the interventions, remembered about them, and what they may have said to their group members about them. This may shed some light on what was the most salient about the interventions to the visitor.

The sign. The interpretive sign intervention incorporated several messages based on different theoretical groundings (Figure 1). It was placed adjacent to the entrance trail at Crystal Forest. The interviews conducted during the sign intervention indicated that indeed visitors were remembering different elements from the sign. For example, 71 percent of visitors interviewed during the sign intervention mentioned that what they remembered most about the sign was what would happen if visitors kept taking the wood (foreseeability of the consequences). Four visitors mentioned the sanctions involved for stealing the wood, and five respondents talked about the mirror. Three mentioned ethics and future generations, and four simply stated that what they remembered was that you shouldn’t take petrified wood. Only one visitor, a thief, said she did not see the sign.

In addition, individual visitors often remembered several different things from the sign. One visitor when asked about the sign said, “it said that you could be put in prison.” When asked what else she remembered about the sign she said, “it said 99 percent of the people were not thieves, but 1 percent was, and that in 15 years all the rocks would be gone.” The same visitor then went on to remark about the mirror on the sign. There was little to no difference in the responses between thieves and non-thieves. In fact, the only element of the sign that was not mentioned by thieves, and that was mentioned by non-thieves, was the fine for taking the wood.

Five respondents interviewed during the sign intervention remembered the message that most people do not steal wood, but that the damage from those few that do take the wood is great. One visitor said, “we were very impressed by the sign that we saw that

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of sampling days</th>
<th>Total # of visitors</th>
<th>Total # of thieves</th>
<th>Mean Theft Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>10</td>
<td>5674</td>
<td>118</td>
<td>2.09</td>
</tr>
<tr>
<td>Uniformed Volunteer</td>
<td>10</td>
<td>5439</td>
<td>74</td>
<td>1.38</td>
</tr>
<tr>
<td>Interpretive Sign</td>
<td>10</td>
<td>5369</td>
<td>75</td>
<td>1.43</td>
</tr>
<tr>
<td>Signed Pledge</td>
<td>10</td>
<td>5596</td>
<td>80</td>
<td>1.41</td>
</tr>
</tbody>
</table>

ANOVA contrast: Control versus Interventions: significant difference at p=.017, t-value=2.491, df=36, standard error of the difference=.8198
said 99 percent of the people do not, but the 1 percent can devastate it over a period of time.” Another respondent stated that, “it talks about what things will be like in a few years if only 1 percent of the population are thieves. Umm, it would soon disappear because of the millions of people that are here every year.” It seems clear that most visitors exposed to the sign remembered and mentioned the consequences of stealing a chip of wood.

Assuming the statements above indicate visitors’ acknowledgment of the foreseeability of consequences, then those visitors that mentioned the photographs also acknowledged the foreseeability of consequences. Taken together, seven of the ten non-thieves and three of the four thieves interviewed during the sign intervention, mentioned the foreseeability of consequences of taking petrified wood. For example, one visitor stated, “what stands out is the vandalism. The picture at the front which shows how it was in ’65 and now in ’95 there’s hardly anything and—it says in 15 years if 1 percent of the visitors take things, there won’t be anything left in 15 years.” Another visitor also typifies this type of response with the statement, “the graphic here of, of the past, the present, and perhaps the future if something is not done, I thought that was very effective.” These visitors clearly understood what would happen if even a small percentage of visitors take wood. That is not to say that this knowledge necessarily affected behavior for every visitor, as one thief remarked, “I think the two photos from 1965 and 1995 are very impressive and so I think if everybody takes one chip, umm, if one person takes, I think every chip is so important as, umm, the big ones.” This remark was made after the visitor admitted the theft.

**The Pledge.** The pledge intervention was given to all visitors as they entered the park. Each visitor was asked to sign the pledge acknowledging that petrified wood theft was a problem and that they would not steal any wood while in the park. All respondents
acknowledged signing the pledge and, as with the sign, subjective responses to the pledge intervention were varied. Three respondents remarked that they thought the pledge was a good idea because there would be less theft. Two respondents talked about the negative consequences if everyone took wood and so they thought the pledge was a good idea to make people think about that. Six simply said that they had to sign a pledge when they came in, and four mentioned the pressure to keep their word. As with all three interventions, many individuals mentioned several different elements from the intervention.

One visitor stated, “after signing it I thought, oh, I can’t scratch my name out now, I guess I can’t take any.” Another thief admitted that she knew she was going to take some wood when she entered the park and so she hesitated to sign the pledge, “I knew I was lying.” Although this may indicate the underlying theory of consistency and commitment (Freedman & Fraser, 1966), later in the same interview the following comment made about the pledge was more in line with pre-conventional moral reasoning theories: “We shouldn’t have signed it because that’s something that could be used against you in court if, you know, if they would have tried to take you to court.” Another visitor appeared to have processed the foreseeability of the consequences for taking wood from the pledge. When asked why he thought people were asked to sign the pledge he said, “well, why is because that you can see right here at this site, right here that everybody picked up all the crystals. They don’t leave anything for me to see.”

*Uniformed Volunteer.* All respondents, except one thief and one non-thief, said they saw the uniformed volunteer. Six respondents simply said they saw her and figured she was here to stop theft. The negative consequences for stealing wood was mentioned by three people, one visitor mentioned the need to protect it for future generations, and another mentioned the fine for taking wood.

On the surface most responses seem to converge on the perception that the uniformed officer was here to stop theft. Comments like, “it’s good also to see a ranger here that is keeping an eye on things,” were very common. In addition, the same visitor went on to state, “because, you know, like, if everybody took just one little bit—it’s gone forever.” The same individual then made the statement that, “I saw her there, and I knew what she was doing, but you know, I’m not gonna pick anything up because (chuckles) the fines are too big.” From this one interview, it is not clear if the presence of the uniformed volunteer primed the attitude that stealing was bad, reminded the visitor of the norm for behavior, or made salient the consequences for performing that behavior. It also suggests that not only do differences exist between respondents in how they process an intervention, but also within one visitor different schemas can be activated by one intervention.

**Study Limitations**

It should be noted that there are several limitations of this study primarily related to the data collection methods used. A larger sample size would have resulted in more robust and generalizable data. Although the interviews conducted provide valid insight into the theft act and the functionality of designed interventions, a larger sample size would have improved the reliability of the data as well. The low sample sizes were due to the practical ability to conduct and analyze the data. Content analysis, although insightful, is often costly and time consuming (Glaser & Strauss, 1973; Bogdan & Biklen, 1992).

In addition, the interviewees may have been responding to questions in a strategic manner to save face in front of the interviewer. When being confronted with the theft
act, respondents were forced to justify their behavior. This could result in visitor responses being formed through reactivity, cognitive dissonance, or other strategic maneuverings. However, embarrassment or face saving considerations did not seem to be strong enough to prompt visitors to return the wood and, in fact, most asked if they could keep it. Although there are clearly data collection limitations, this study is a first step into gaining qualitative insights into depreciative behavior. Increasing the sample size, minimizing the confrontational nature of questions, and increasing the types of data collected will help ensure quality data in the future.

Conclusion
Subjective responses from visitors can give some contextual understanding into depreciative behavior in natural recreation areas and how interventions may work to inhibit the behavior. Most thieves appear to fall in the “responsibility-denial” category of violators described in Gramann and Vander Stoep’s (1987) taxonomy. Statements made by thieves indicate that they were aware that taking petrified wood was generally wrong. However, they seemed to be invoking “not in this case” rationalization for why it was okay in their particular circumstance to take the chip. The most common response was that it was okay because it was such a small chip. We also found that some violators may not have been applying the norm regarding theft to the chips of wood on the site. This could have been because they did not understand or accept the responsibility for the consequences for the behavior. In addition, using attitude theories to interpret the same result, visitors may not have seen the applicability of their attitude regarding theft to taking chips of wood from the site.

Of all of the thieves interviewed, only one said he was sorry for taking the wood and none of the thieves returned the wood to the site. In fact, several asked if they could keep it. One visitor, after remarking about the devastating results if only a few people took wood, and apologizing for taking his chip, still asked if he could keep it! This could be supporting evidence for Hardin’s (1968) tragedy of the commons perspective on depreciative behavior. Despite some thieves’ acknowledgment of the negative consequences for the behavior, they still wanted the chip. The personal benefit of getting a chip of wood was still greater than the cost, which was shared by everyone. This result could be used to explain why some have concluded that depreciative behavior may never be reduced to zero (Vande Kamp et al., 1995).

It became clear that the theories of behavior change used to create the interventions were practically working in ways suggested by the theories. In addition, the primary directive behind the creation of the interventions was that behavior change strategies do not have blanket effectiveness for all individuals. Therefore, interventions, like the sign, incorporated multiple messages theoretically grounded in a range of behavior change strategies. Interviews revealed that visitors were processing and responding to a myriad of behavior influence techniques from a single intervention. In fact, even for the uniformed volunteer intervention, which on the surface may intuitively seem to be effective because of the single element of a threat of or increased probability of getting caught and fined, the interviews revealed that the effectiveness appeared also due to several other reasons. These responses coupled with the statistical reduction in the theft rate suggest that the interventions were working in accordance with the theories used to create them.
Results of this study also provide insights into why visitors took the wood. For example, most thieves indicated that taking one little chip could not hurt anything. Therefore, the message that attempted to convey the negative consequences for taking a chip was appropriate but not processed or accepted by all visitors. All visitors interviewed acknowledged that they knew that taking petrified wood was wrong. Most thieves, however, only applied this rule or norm to the larger pieces of wood. In addition, attitudes or norms regarding stealing seemed to also be selectively applied by thieves. For example, for most thieves, stealing wood from the gift shop was more clearly wrong than taking wood from the site.

Results of this study provide several insights that may help reduce the noncompliant behavior of petrified wood theft. First, making visitors aware of the norm or rule for behavior and its applicability to their situation is critical to theft reduction. Secondly, visitors must understand the negative consequences for stealing petrified wood. This includes conveying the negative consequences to the visitor of performing the behavior and conveying the negative consequences to the environment of the behavior. Thirdly, specific behavioral requests should be more effective than generic ones. Incorporation of all three appeals should serve to reach more visitors than singular approaches. As long as visitors can rationalize their own depreciative behaviors as acceptable, we may not be able to reach every visitor every time. However, with a richer understanding of why such behaviors occur and how interventions may work to inhibit the behaviors, we may be able to reach most of the people, most of the time.

Literature Cited


Assessing the Non-Market Value of Heritage Interpretation

Andrew D. Carver *
Human Dimensions Research Unit
Department of Forestry
Southern Illinois University Carbondale

Cem M. Basman
Department of Recreation and Park Administration
Indiana University Bloomington

John G. Lee
Department of Agricultural Economics
Purdue University
West Lafayette, Indiana

Abstract
Quantifying the value-added service which interpreters provide is crucial in protecting and managing all of our important resources. Unlike most private goods and services which have an observed price, most historic, cultural, or natural resources represent non-market goods. While researchers have traditionally used tourist spending combined with input-output models to estimate the value of non-market resources, this technique does not adequately capture the value of interpretive services. The primary purpose of this article is to present a general economic framework which can be used to assess the value of heritage interpretation. An economic model is presented to illustrate graphically how one could measure the total and marginal social value of interpretation. An overview of different non-market valuation techniques and a discussion of how economic values relate to an interpretive process model is also provided. The article concludes with an economic perspective on the issue of interpreter certification.

Keywords
heritage interpretation, non-market valuation, willingness-to-pay, contingent valuation method, economic valuation, interpreter certification, travel cost models, tourism

* Corresponding author: Andrew Carver, Assistant Professor, Human Dimensions Research Unit, Department of Forestry, Southern Illinois University, Carbondale, IL 62901-4411, email: acarver@siu.edu, Tel. (618) 453-7461.
Introduction

While it is often viewed that effective heritage interpretation adds value to historic, cultural, and natural resources (Knudson, Cable and Beck, 2003, p. 385), quantification of the economic value can be problematic. Researchers have traditionally used tourist spending combined with input-output models to estimate the value of a given site or resource. This technique does not adequately capture the total and/or marginal value of heritage interpretation to individuals or to society as a whole.

Why should one care about placing an economic value on heritage interpretation? One reason is to provide policy decision makers (legislators, agency administrators, local officials, etc.) with information on the relative value of heritage interpretation. Yet, interpretation can be broadly classified as a non-market service with no observable market price. Lindberg and Johnson (1997) state that non-market impacts should be valued and incorporated in the policymaking process. This information can help decision makers in allocating scarce dollars across competing uses. For example, what proportion of an agency’s budget should be allocated to restoring deferred maintenance versus interpretive services? If resource allocators are unaware of the non-market value-added by interpretation, they may tend to under-invest in this area.

In a commentary entitled “If Not Us, Who? If Not Now, When?” Will LaPage (2002) expressed the concern that interpreters have failed to garner sufficient budgetary support for their programs. Brochu and Merriman (2002) point out that many interpretive programs are discarded during financially difficult times due to a detachment of the program from the managing agency or organization. There are two potential reasons for the lack of budgetary success for interpretive programs. First is the free-rider problem characterized by individuals waiting for someone else to step up and plead the case for interpretive services. A second reason is the absence of economic research on the value of heritage interpretation.

There is a body of economic theory that can be used to assess the economic value of interpretation. This theory is based on the assumption that individuals are utility maximizers subject to general constraints on their household budget, time, and available information. From this theory, a set of demand functions exist for market as well as non-market goods and services. The purpose of this article is to present a general economic framework which can be used to assess the value of interpretation. An overview of different non-market valuation techniques is also provided. A discussion of how economic values relate to an interpretive process model follows. The final section provides an economic perspective on the issue of interpreter certification.

Basic Economic Model

Unlike most private goods and services which have an observed price, most historic, cultural, or natural resources represent non-market goods. Non-market goods are often characterized as being non-rival and/or non-exclusive. Non-rivalness occurs when one’s consumption or enjoyment of consuming a good does not reduce the availability of the good to others. Non-exclusivity relates to the inability to exclude users from the good. For example, a public park is generally non-rival and non-exclusive while a seat on a particular airline flight is exclusive and rival. The properties of non-rival and non-exclusion inhibit the development of exchange prices for such resources.

An additional challenge in defining an economic value of interpretation is the ability to separate the cultural or natural interpretation resource (i.e. good) from the interpre-
tive experience (i.e. service). Most economists would argue that interpretation represents a value-added service to a given resource. Others may claim that interpretation is a joint output with a given resource. Therefore, if one could determine the total value of the experience across users less the value of the resource without interpretation, the difference could be attributed to the provided interpretive services.

Figure 1 illustrates an example of how one could determine the economic value of interpretation for a given site. The vertical axis represents the cumulative dollar value of what society is willing to pay (WTP) to preserve the resource. The horizontal axis represents the number of people (users and non-users) surveyed. The line $WTP_{W/O}$ represents the rank ordered maximum willingness to pay across individuals for the resource without interpretive services. The vertical intercept represents the highest dollar amount an individual is willing to pay to preserve the resource. The horizontal intercept represents the point where the willingness-to-pay for the next person equals zero. Therefore, the total area under $WTP_{W/O}$ corresponds to the social value of a non-market good. A second willingness to pay which includes interpretation ($WTP_{W/I}$) can be estimated. This estimate includes both the value of resource and the interpretive service. To derive an economic value one could use the difference of the value of interpretation in WTP function (i.e. $WTP_{W/O} - WTP_{W/I}$) to provide such an estimate. It should be noted however, that in the case of poor interpretation this value could be negative. That is, $WTP_{W/I} < WTP_{W/O}$. An overview of how estimates of willingness to pay can be derived is discussed later in the following section.
Overview of Non-Market Valuation Methods

Entry fees have been suggested as one means of valuing certain non-market outputs. Fees are often associated with non-rival, yet congestible and excludible, goods. Many resource recreation areas charge a per-person or daily user fee. In addition, guide fees for recreation and tourism provide data to estimate the value of a specific resource or experience.

It can be argued that fees often underestimate the social value of a good or service. Particularly, those goods that are non-rival in consumption such as parks, recreation areas, or rural landscapes. In many cases, fees are set low to provide an income stream for maintaining the facility rather than as a measure of the social opportunity cost of providing the service. In addition, some fees are a lump sum, like a season pass, and it may be difficult to provide a per-person or per-visit estimate. Fees do not capture the full willingness to pay for enjoyment that one derives from visiting an area or taking guided excursion. Specifically, fees do not measure consumer surplus (willingness to pay above and beyond the actual cost of the fee). Fees also reflect a lower bound estimate of use value of a good or service and do not capture the option or existence value of a non-market good.

Another method that has been used to estimate the value of non-market goods is the Travel Cost Model (TCM). This technique surveys on-site users to determine the distance and time they traveled as well as the number of trips to a specific site. This information is combined with per mile and per hour costs to determine a travel cost estimate for each user. Then a regression model is applied to the set of users to determine travel cost as a function of trips, distance, and time. In this case, travel cost is used as a price proxy to value.

Travel cost models have been applied to determine the value of selected recreation sites. Because only on-site users are surveyed, no zero use observations are collected. Often the highest travel cost value by a visitor is used as a demand intercept to anchor estimates of consumer surplus. This creates issues for econometric estimation since the observations are truncated at one.

Travel cost models rely on several assumptions in determining a price proxy. First, it is assumed that the trip or trips to a given location are single purpose. This assumption may not be accurate for those users that travel long distances. Often long trips include stops at multiple sites. Another assumption, which has drawn criticism in the literature (Ward and Loomis, 1986), is whether the time on-site should or should not be included in travel cost. Other limits often include the lack of substitute sites for demand estimation, whether the number of trips or the number of visitor-days accurately reflect quantity, variability, and time period or periods over which on-site users are interviewed.

While travel cost models have been applied to estimate the value of different recreational and tourist sites, the method exclusively focuses on on-site use value. It does not capture the option or existence value of a given resource.

A final technique that has been used to value non-market goods and services is the Contingent Valuation Method (CVM). Under this technique, valuation of a good relies upon individual responses to contingent circumstances in an artificially structured market. The dependent variable is generally a monetary measure of either willingness to pay (WTP), willingness to accept (WTA), or willingness to avoid (WtoA). Elicitation of individual values are collected through face-to-face interviews as well as telephone, mail, and e-mail/internet surveys.
Boyle and Bishop (1988) provide an overview of the three primary methods of obtaining willingness to pay estimates using CVM. These methods include payment card, interactive bidding, and dichotomous choice. Under the payment card method, the interviewee is asked to select a given monetary interval from a set of payment ranges. This method is most common for mail type surveys. In the case of interactive bidding, the interviewee is asked initially what they would pay or if they would be willing to pay a given dollar amount for a particular good. Based on their response, the surveyor would provide the interviewee with higher or lower values until the individual converged to a specific value. Dichotomous choice involves a simple yes or no response from each individual of whether they would be willing to pay a specific dollar amount for a good. While each person interviewed only responds to a single value, by surveying a large number of individuals that are exposed to a broad range of monetary values, the researcher is capable of estimating the overall or aggregate demand function for the good.

Value estimates from CVM have been derived for numerous types of goods. Applications range from valuing habitat preservation and selected endangered species to environmental damage from off-shore oil spills. For example, utilizing CVM, Samples, Dixon, and Gowen (1986) examined endangered species; Bishop, Heberlein, and Kealy (1983) examined waterfowl hunting; and Fix, Loomis, and Manfredo (2002) examined wildlife viewing. Drake (1992) generated WTP estimates for landscape preservation in Sweden for three types of uses—grain, pasture, and woodlands. Barro, Manfredo, Brown, and Peterson (1996) utilized a WTP study to examine the predictive validity of the attitude-behavior link within the context of protecting natural areas. Unlike other valuation techniques, CVM is theoretically capable of capturing use, option, and existence value of non-market goods and services. This feature is particularly important if one wishes to value non-rival and non-exclusive benefits associated with interpretive services.

Although CVM has been used extensively, there are numerous limitations and criticism of this technique. McFadden (1994) argues that existence values for natural resources are far outside most consumer market experience. He also states that the elicitation method, information, and phrasing in the survey affect the entire willingness to pay (WTP) distribution. Likewise, he showed in his research that embedding, that is the value placed on a resource is independent of the scale or scope of the resource, was present.

Others have criticized CVM by identifying several biases that can affect value estimates. These concerns include payment vehicle bias, starting point bias, information/interviewer bias, strategic bias, and hypothetical bias. Payment vehicle bias is a case where the willingness to pay is dependent on the type of elicitation method used (i.e. payment card, interactive bidding, dichotomous choice). Similarly, starting point bias or anchoring can occur when the distribution of WTP depends on the initial value provided to survey respondents. Information/interviewer bias is a situation where WTP is dependent on the information provided before and during the survey. Strategic bias is a case where the interviewee perceives it beneficial for them not to reveal their true WTP. Finally, hypothetical bias can occur when respondents view the experiment as a game or purely a hypothetical situation without reference to their own incomes or preferences.

While all non-market valuation techniques have their limitations, estimates from these exercises have been used in damage suits and public policy formulation. Given the nature of interpretation, CVM appears to be the best suited technique to estimate the social value of interpretive services.
The Link Between Economic Value and Interpretation

In the first textbook written specifically about the topic of interpretation, Sharpe (1982) identified numerous benefits of interpretation. These benefits include the enrichment of visitor experience, informing the public on resource management, enriching public support, and arousing citizen concern. Beck and Cable (1998, p. 4) identify interpretation as a process that defines a story that provides a view beyond the normal capacity of the visitor. Knudson, et al. (2003, p. 8) state that interpretation programs assist the visitor to gain a sense of place in response to the resource. In economic terms, these activities should enhance participant’s utility and increase the non-market demand from the public for a given resource.

For the purposes of the current discussion, the link between economic value and the interpretation process can be illustrated in a simple communication model. Figure 2 illustrates an expanded interpretive process model (Basman, 1992) that includes feedback and pre-assessment loops that ultimately impact the value visitors place on their experience.

The source can be an individual or group of individuals that represent an agency, organization, or business that conducts the interpretive process. Often, for personal interpretive contacts or presentations, these interpreters can pre-assess the receiver audience to determine at what level of detail and focus they should select in delivering the message and the medium. Knowing how information is processed across different population segments is key to an effective interpretive program. The message and medium component in Figure 2 relates to what is being interpretive (i.e. context) and how the message is being delivered. The medium includes both personal presentations as well as non-personal services such as sign, models, and brochures.

The receiver is defined as the target audience for whom the message is intended to reach. Preferences of the receiver shape their utility level from interpretive services. Through interaction and feedback, the source should determine the needs and preferences of the receiver.

The stylized model presented in Figure 2 is a simple framework to illustrate the interpretive process. Effective interpretation also depends on the ability to integrate physical and biological dimensions with social sciences and the arts. It should be noted that the economic value placed on interpretive services also depends on the complementary set of physical resources. These physical resources include visitor centers, signage, layout, interpretive stations, props, models, and landscape. Complementary physical resources have the ability to enhance users’ utility and their willingness to pay to preserve the resource.

Conversely, there are physical and biological factors that can reduce the economic value due to interpretation. Congestion, architectural style, noise, limits on access, pests, and construction activities are examples of factors that can reduce the social value of interpretation.

These additional factors need to be considered in developing economic estimates on the value of interpretive services for a given resource. Prior economic research tends to focus on a price proxy or value of the resource itself while what is needed is an estimate of the value added to the resource from interpretation.

A Lack of Economic Research

A review of the economics literature on the valuation of interpretation is dominated by studies that focus on tourism spending and economic multipliers which estimate the “rip-
ple effects” of tourist spending on other sectors in the economy (Zhou, Yanagida, Chakravorty, and Leung, 1997; Lindberg and Johnson, 1997; McHone and Ringeling, 2000; and English and Bergstrom, 1994). A large proportion of these studies use estimates of tourist spending for travel, meals, lodging, fees, and gifts as a direct primary driver of value. These estimates are often extended through the use of input-output models with economic multipliers to examine the impact of tourism on a regional economy.

While this type of economics research may have value for community and regional development, it does not adequately capture the value of interpretation. That is, the social value of interpretive services provided jointly with cultural, historic, or natural resources should not be measured solely by revenues and economic multipliers. Instead, contingent valuation experiments should be undertaken to provide estimates of the total and marginal social value.

From a practical standpoint it would be economically unfeasible to conduct CVM studies for all sites that provide interpretive services. However, basic CVM research is needed to segregate the contribution of heritage interpretation to selected resources. This type of research could be used to not only aid in allocating scarce dollars across multiple sites, but also to provide evidence that additional funding to support interpretive programs has utility and is useful to parent organizations.

**The Economics of Certification**

Up to this point, the discussion on the economic value of interpretation has assumed the service as a homogenous input. The quality of interpretive experiences can vary widely from person to person and from one site to another. From an economic perspective, quality differences in interpretation can be expressed as a larger rightward shift of the willingness to pay function.

Figure 3 provides a graphical view of how additional professional training and certification could affect the social value of interpretation. In this case, the difference between WTP\(_{WI/I}\) (with interpretation but no certification and training) and WTP\(_{WI/I&C}\) (with interpretation and certification) represents the marginal social benefits of a certification program. The difference in WTP is due to change in quality. These changes can be due to additional education, training, and certification of interpreters.
Economists would argue that a certification and training program for the interpretation profession should be undertaken if the marginal social benefits (represented by area A in Figure 3) are greater than or equal to the marginal social cost. The cost of a certification program includes several components. The components include the development of educational programs, the monetary cost of participation, the opportunity cost of interpretation training, administrative costs, and the cost of enforcement. The marginal social cost of certification is how the total cost changes for one more interpreter. Once developed, education and training programs typically have low marginal costs.

The National Association for Interpretation has newly established a professional certification program. A non-market valuation analysis of the certification may prove useful. The cost of implementing a professional certification program should be considered via several questions. What incentives do interpreters have to participate in such programs? How affective is the administration of these programs? How stringent are the controls over the criteria to obtain certification? Ultimately, to what degree will professional certification increase the social value of interpretive experiences? These are questions that need to be asked and answered before an economic evaluation can be conducted on the value of a certification program.

One area sometimes overlooked in the discussion of certification is the role of volunteers. How would individual interpretive volunteers respond to a certification program? Many of the existing agencies and organizations rely on volunteers to deliver either all or components of the interpretive services. Many of these individuals do so not for monetary compensation, but because they derive utility from educating and motivat-
ing others. An additional social cost to consider in an economic analysis is how a certifica-
tion program might limit the future supply or availability of volunteer interpreters.

**Summary and Conclusions**

Limited economic research exists on the valuation of interpretation. Most economic studies rely on estimates of tourism spending and input-output model multipliers to
determine the economic impact of a given resource. This technique does not adequately
capture the social value that interpreters provide members of society.

An economic model is presented to illustrate graphically how one could measure the
total and marginal social value of interpretation. Importantly, the economic model can
be extended to evaluate the marginal social benefits and marginal social costs of the cur-
rent professional interpreter certification program. An overview of non-market valuation
techniques is provided along with an explanation of how social value depends on
both the interpretation process and the set of complementary resources.

Finally, a call for expanded economic research on the valuation is needed. Why
should one care about the economic value that interpreters provide society in general?
One response is to help policy decision makers in allocating scarce funding across com-
peting uses. Educating them on the important role interpreters play in enhancing social
welfare is critical. One must not fall into the assumption that the lack of an economic
value estimate infers a lack of value to society. Quantifying the value-added service that
heritage interpreters provide is crucial in protecting and managing all of our important
cultural and natural resources.

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Questions should be directed to:

Carolyn Ward  
ENRS Department  
Humboldt State University  
Arcata, CA 95521  
707-826-5639  
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