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The objective of the Northeastern Recreation Research (NERR) Symposium is to influence our profession in a positive way by allowing managers and academicians in the governmental, education, and private recreation and tourism sectors to share practical and scientific knowledge. This objective is met through providing a professional forum for quality information exchange on current management practices, programs, and research applications in the field, as well as a comfortable social setting that allows participants to foster friendships with colleagues. Students and all those interested in continuing their education in recreation and tourism management are welcome.

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*GIS APPLICATIONS AND
RECREATION RESOURCE QUALITY*

MANAGING RECREATION ON MOUNTAIN SUMMITS IN THE NORTHERN FOREST REGION OF MAINE, NEW HAMPSHIRE, NEW YORK, AND VERMONT

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Abstract.—Land managers in the Northern Forest region of Maine, New Hampshire, New York, and Vermont face the challenge of providing high-quality recreation opportunities and experiences while also protecting fragile summit resources. The goals of this study were to identify indicators and standards of quality for visitor experiences and summit resources for three mountains with a range of recreation opportunities. Crowding, trail condition, damage to summit soils and vegetation, and type and level of management were found to be important indicators of quality. A visitor survey identified the social, resource, and management conditions that visitors find minimally acceptable. An assessment of summit resources quantified relative cover of vegetation, exposed soil, lichens, and bedrock. Overall, visitors to the three summits reported having high-quality recreation experiences. However, resource conditions on two summits were below what visitors find minimally acceptable. The management implications related to using a monitoring system are discussed.

1.0 INTRODUCTION

Mountains are highly valued resources for recreation and tourism (Godde et al. 2000) and provide a wide range of recreation opportunities. However, mountains are also ecologically fragile and highly susceptible to recreation disturbance and adverse impacts (Hammitt and Cole 1998, Monz 2000, Slack and Bell 2006), including loss of vegetation cover, soil exposure, and soil erosion (Billings 1973, Ketchledge et al. 1985,

Larson 2004). In addition to ecological impacts, high visitation rates at mountain summits can threaten the quality of the recreation experience. Crowding, conflict, and resource impacts can detract from the quality of the visitor experience (Manning et al. 2004, Manning 2007). The challenge facing managers of mountain summits is balancing recreation opportunities and resource protection.

The concept of carrying capacity and its related frameworks can prove useful in guiding management of recreation on Northern Forest mountain summits. Frameworks such as Limits of Acceptable Change (Stankey et al. 1985) and Visitor Experience and Resource Protection (National Park Service 1997) rely on formulating indicators and standards of quality for resource and social/experiential conditions that reflect management objectives. Management objectives are statements that define the desired resource and social conditions within a park or protected area. Indicators of quality are measurable variables that serve as proxies for management objectives. Standards of quality define the minimum acceptable condition of indicator variables. This study was designed to help guide the formulation of indicators and standards of quality for resource conditions and the recreation experience for a spectrum of mountain summits in the Northern Forest.

2.0 METHODS

2.1 Selection of Study Sites

We adapted and applied Clark and Stankey's (1979) Recreation Opportunity Spectrum (ROS) to mountain summits. We created a spectrum of four mountain recreation opportunity settings based on five criteria: access, use level, recreational uses, management presence, and level of development. The spectrum ranged from "primitive" summits to "developed" sites. We compiled a list of 153 summits in the Northern Forest region of Maine, New Hampshire, New York, and Vermont. Individuals from management agencies and user groups from the four states evaluated summits according to the mountain summit ROS. The final study sites represented

different points along the spectrum. Cadillac Mountain in Acadia National Park, Maine, was chosen to represent the “developed” end of the spectrum; Cascade in the Adirondack State Park, New York, was chosen to represent the “primitive” end of the spectrum; and Camel’s Hump in Camel’s Hump State Park, Vermont, represented the middle of the spectrum.

2.2 Visitor Survey

We surveyed a representative sample of visitors at each study site using an on-site questionnaire during the 2008 summer and fall hiking season (July - October). The first section of the questionnaire focused on identifying potential indicators of quality and included a series of open- and close-ended questions. Open-ended questions asked visitors what they enjoyed most and least about their experience at the summit, and what they would like managers to change. Close-ended questions asked visitors to rate the importance of several issues or problems at the summit they visited. The second section of the questionnaire focused on identifying standards of quality and asked visitors to rate the acceptability of a range of resource, social, and management conditions. These questions reflected normative theory and methods (Manning 1985, Vaske et al. 1986, Shelby and Vaske 1991,; Vaske and Whittaker 2004), and used visual and long- and short-question formats (Manning et al. 1999, Manning and Freimund 2004). The following six indicator variables were addressed: 1) number of people on the trail, 2) number of people off the trail, 3) impact to the trail corridor, 4) impact to summit resources, 5) level of trail development, and 6) management tactics designed to discourage off-trail hiking. Visitors completed 476 questionnaires (Cascade $n = 126$; Camel’s Hump $n = 157$; Cadillac Mountain $n = 193$) with an overall response rate of 83 percent. We conducted analysis of variance (ANOVA) tests to detect differences in the acceptability of impacts and intensity of management across the spectrum of summits.

2.3 Resource Assessment

We adapted and applied methods used in campsite impact assessments (Leung and Marion 2000) and range management (Booth and Cox 2008) to measure ground cover on mountain summits. We used a grid transect

method to sample a representative area of each summit. We manually analyzed overhead digital photographs of 1-m² plots using SamplePoint (Booth et al. 2006) to quantify relative cover of vegetation, exposed soil, bare rock, and lichens. We ran ANOVAs to identify significant differences in resource condition among the three summits.

3.0 RESULTS

3.1 Indicators of Quality

Analysis of the visitor survey data identified trail condition, crowding, summit management techniques, and damage to vegetation and soils on and off the trail as important indicators of quality for recreation on mountain summits.

3.2 Standards of Quality

The survey asked respondents a series of questions to help identify standards of quality for the indicator variables discussed above. Visitors then viewed a series of six computer-generated photographs showing a range of social, resource, and management conditions and evaluated the acceptability of each condition. Acceptability was measured on a 9-point scale ranging from -4 (“Very Unacceptable”) to +4 (“Very Acceptable”). Average acceptability ratings were calculated for each summit and plotted to form a social norm curve. Respondents also indicated which photographs most closely represented the conditions they encountered during their summit visit.

The first series of five photographs depicted increasing numbers of people along a section of the summit trail. See Table 1 for a summary of visitor responses to this battery of questions. Some significant differences emerged in how respondents viewed increasing levels of use. Overall, visitors to Cadillac Mountain were more tolerant of higher use levels than visitors to Cascade or Camel’s Hump.

The second set of questions included five photographs showing increasing numbers of off-trail hikers. Visitors to Cadillac Mountain, Camel’s Hump, and Cascade displayed strikingly similar norms regarding the acceptability of off-trail use (Fig. 1). There were no

Table 1.—Summary of respondents' assessments of on-trail use levels

Use Level	Cascade (n = 117-124)	Camel's Hump (n = 143-156)	Cadillac (n = 177-192)	ANOVA	
	Mean	Mean	Mean	F-value	p-value
0 people	3.56	3.67	3.38	1.722	.180
9 people	2.68 ^a	2.14 ^{a,b}	3.10 ^b	13.474	< .001
18 people	1.08 ^c	0.63 ^b	1.85 ^{b,c}	13.051	< .001
27 people	-0.73 ^c	-0.93 ^b	0.13 ^{b,c}	9.479	< .001
36 people	-2.38 ^c	-2.47 ^b	-1.51 ^{b,c}	8.918	< .001
Acceptability	23.37	21.63	27.71	-	-
Typically Seen	13.59 ^{a,c}	10.71 ^{a,b}	19.08 ^{b,c}	43.367	< .001

Any two summits that share a superscript are significantly different ($p \leq .05$) according to Bonferroni's least significant difference test.

significant differences in the average acceptability of increasing off-trail use. Visitors to Cascade and Cadillac Mountain found a maximum of approximately 17 people off-trail to be acceptable, while at Camel's Hump the maximum was about 15. Respondents at Cadillac Mountain reported seeing significantly higher levels of off-trail use than did hikers on the other summits ($F = 9.593$; $p < .001$). Hikers at Cascade typically saw 11 people off-trail, hikers on Camel's Hump observed approximately 10, and hikers at Cadillac Mountain saw about 14 people off the designated trail.

Next, respondents viewed a series of five photographs showing increasing levels of impact to the trail corridor (e.g., trail widening, root exposure, soil erosion). Again, the norms displayed by visitors at the different summits were remarkably similar (Fig. 2). The amplitudes of the social norm curves are relatively low, indicating that trail impact was not highly salient to visitors.

However, this result contradicts responses from the open-ended questions that showed trail condition to be an important indicator of quality. It is possible that visitors were unable to recognize the subtle changes in trail condition depicted in study photos. It is also possible that visitors simply did not identify any negative impact to the trails in the photos. Previous research has suggested that visitors' perception of environmental impacts resulting from recreational use tends to be limited, especially when compared to those of managers and trained observers (Farrell et al. 2001, Park et al. 2008). However, other research has suggested that visitors have normative

standards for the environmental conditions they encounter in parks and protected areas, and that these resource impacts can be an important factor in defining the quality of the recreation experience (Manning et al. 2004). There were no significant differences among the study sites in the acceptability ratings given to study photographs, the maximum amount of trail impact acceptable, or the level of impact visitors typically saw.

The fourth survey question dealt with impacts to the summit area (e.g., vegetation cover loss, root exposure, soil erosion). Visitors viewed five photographs showing 90 percent, 75 percent, 50 percent, 25 percent, and 10 percent of the summit area with green plant cover. Figure 3 shows the resulting social norm curves. Respondents indicated that the minimum amount of vegetation cover that was acceptable was between 43 percent and 47 percent, and reported seeing relatively high levels of cover (62 percent at Cascade, 67 percent at Cadillac Mountain, and 72 percent at Camel's Hump). There were no significant differences in the acceptability of study photos among the study sites.

The fifth battery of questions concerned type and level of trail management. Three photographs presented to respondents showed 1) a "natural" bedrock and soil trail, 2) a trail with stepping stones placed in areas of bare soil, and 3) a paved trail. None of these received an overall average negative (or "unacceptable") rating at Cadillac Mountain. The paved trail received the highest average acceptability rating and the "natural" trail the lowest, with ratings of 1.9 and 1.2, respectively. At both



Figure 1.—Social norm curves for the acceptability of off-trail use levels.

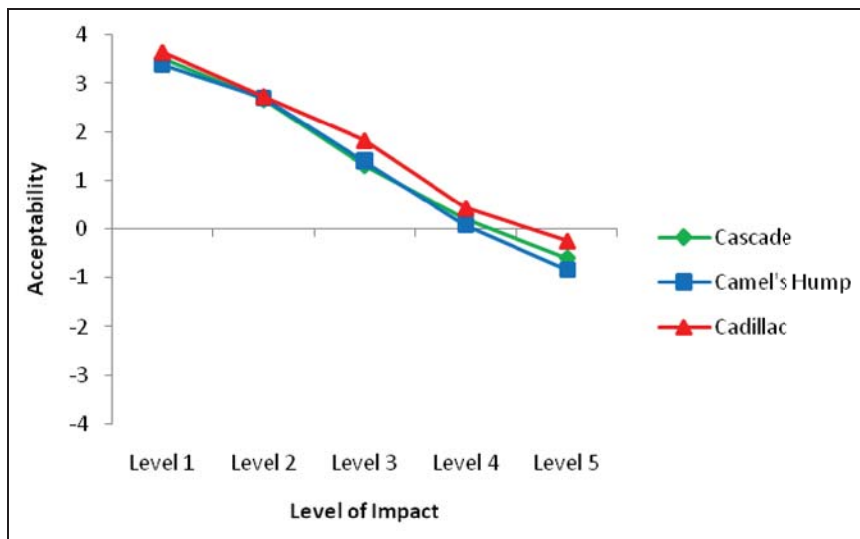


Figure 2.—Social norm curves for the acceptability of trail impacts.

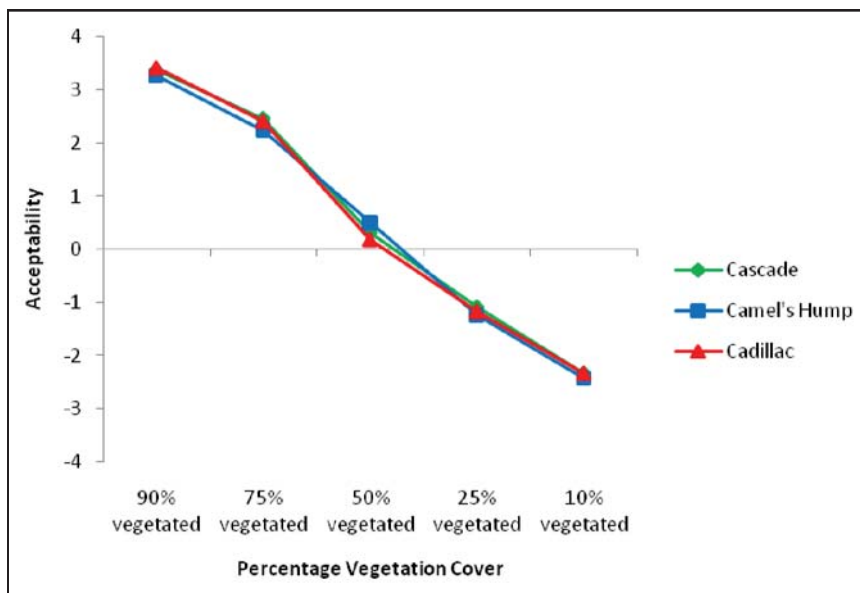


Figure 3.—Social norm curves for the acceptability of summit impacts.

Table 2.—Summary of respondents' assessments of visitor management tactics

Management Practice	Cascade (n = 117-124)	Camel's Hump (n = 143-156)	Cadillac (n = 177-192)	ANOVA	
	Mean	Mean	Mean	F-value	p-value
Cairns and Paint Blazes	3.11 ^c	2.96 ^b	1.55 ^{b,c}	25.158	< .001
+ Sign	2.73	2.60	2.27	2.791	.062
+ Intermittent Scree Walls	1.77	1.74	1.63	.167	.846
+ Continuous Scree Wall	0.74	0.28 ^b	1.19 ^b	5.350	.005
+ Rope Fencing	-2.32 ^c	-2.28 ^b	-0.93 ^{b,c}	14.196	< .001
Typically Seen	1.46 ^{a,c}	2.17 ^a	2.39 ^c	23.708	< .001

Any two summits that share a superscript are significantly different ($p \leq .05$) according to Bonferroni's least significant difference test.

Table 3.—Summary of land-cover analysis

Land Cover Class	Cascade	Camel's Hump	Cadillac	ANOVA	
				F-value	p-value
Vegetation	20.40 ^{a,c}	44.25 ^a	44.29 ^c	32.879	< .001
Lichens	3.14 ^{a,c}	32.70 ^a	36.25 ^c	116.557	< .001
Organic Soil	1.78 ^{a,c}	0.52 ^a	0.39 ^c	11.047	< .001
Mineral Soil	4.72 ^a	0.59 ^{a,b}	6.73 ^b	20.703	< .001
Bare Rock	68.45 ^{a,c}	20.11 ^{a,b}	11.27 ^{b,c}	369.198	< .001
Vegetation	20.40 ^{a,c}	44.25 ^a	44.29 ^c	32.879	< .001
Lichens	3.14 ^{a,c}	32.70 ^a	36.25 ^c	116.557	< .001

Any two summits that share a superscript are significantly different ($p \leq .05$) according to Bonferroni's least significant difference test.

Camel's Hump and Cascade, the "natural" trail received the highest overall acceptability rating (3.3 and 3.2, respectively), and the paved trail received a moderate negative rating (-2.3 and -2.2, respectively). Visitors to Cadillac Mountain rated the "natural" trail significantly less acceptable ($F = 52.107$; $p < .001$) and the paved trail significantly more acceptable ($F = 161.332$; $p < .001$) than visitors to Cascade and Camel's Hump. This response may be because the summit loop trail on Cadillac Mountain is paved.

Finally, visitors viewed a series of five photographs depicting increasingly intensive management practices designed to discourage off-trail hiking. Tactics shown in the study photographs were additive. The first photo showed rock cairns and paint blazes along the trail to guide hikers; the second photo added a sign asking hikers to stay on the trail; the third added intermittent scree (rock) walls lining areas of the trail adjacent to vegetation; the fourth added a continuous scree wall defining the margin of the trail; and the fifth photo

added a rope fence to prevent visitors from leaving the trail. See Table 2 for a summary of respondent ratings for these photos. In general, as the intensity of the management actions increased, overall acceptability decreased. The one exception is Cadillac Mountain: visitors gave the highest rating to the photograph with the sign (photo #2 in the sequence). The rope fencing treatment was the only management strategy that received an overall negative acceptability rating. These results suggest that visitors to all three summits are willing to accept a variety of management practices that are designed to protect summit resources, so long as they are not overly obtrusive.

3.3 Current Ecological Conditions

The land cover analysis found a large amount of variation among the three summits. Table 3 presents a summary of the results. Significant differences occurred in the amount of vegetation cover, lichen cover, exposed soil, and bare rock across the spectrum of summits. Cascade had the lowest percent vegetation cover and the largest

amount of bare rock. Camel's Hump and Cadillac Mountain had similar relative vegetation cover on their summits, though Camel's Hump had significantly more bare rock. Camel's Hump had the lowest percent cover of exposed soil (1.1 percent of the summit area), while exposed soil accounted for 6.5 percent of the summit area on Cascade and 7.1 percent on Cadillac Mountain. Erosion is mostly to blame for the very high amount of exposed bedrock on Cascade. Although natural erosive forces are the main cause of soil loss, hiking also caused some of these impacts (Julia Goren, Adirondack High Peaks Summit Steward Program Coordinator, personal communication). Trampling of vegetation by hikers exposes the soil to wind and water, which quickly erode the thin soils (Ketchledge et al. 1985, Hammitt and Cole 1998). Hikers on Cascade continue to trample fragile vegetation and soils, and further losses are observable (Frank Kreuger, Adirondack High Peaks Summit steward, personal communication).

Cascade also differs dramatically from the other two summits with regard to its relative cover of lichens. The cause of the low lichen cover on Cascade is uncertain. Lichens are highly sensitive and vulnerable to sulfur dioxide and heavy metal concentrations associated with acid deposition (Larson 2004). The Adirondacks have suffered extensive damage from acid deposition (Driscoll et al. 2003), which may be the cause of Cascade's low lichen cover. Another possible explanation is the high rate of soil erosion that has occurred recently; lichens may not have had the chance to recolonize the more recently exposed bedrock surfaces. However, there is also reason to suspect recreation as a factor. Examination of monitoring photo points on Cascade and observation of nearby mountains that have high lichen cover suggest that Cascade's lack of lichens may be due to hiking pressure (Julia Goren, personal communication), as hikers' boots and trekking poles can scuff lichens off the surface of the rock. Whatever the cause, the lack of lichen cover on the exposed bedrock at Cascade's summit is of great concern as lichens are critical to ecosystem functioning. Their ability to colonize exposed bedrock and to create and stabilize soils is important to the recovery of mountain ecosystems following disturbance (Larson 2004).

4.0 DISCUSSION AND CONCLUSIONS

Visitors to Cascade, Camel's Hump, and Cadillac mountains appear to be receiving high quality recreation experiences. Respondents reported encountering better than minimally acceptable conditions. They were also willing to tolerate a wide range of management tactics designed to protect summit resources. Highly intensive management was less acceptable than more subtle tactics, so managers should avoid using obtrusive practices unless absolutely necessary. Managers should also keep in mind that tactics that are acceptable at one site might not be acceptable in other contexts.

Some differences arose in the acceptability of certain conditions among summits located at different points along the mountain summit ROS. Specifically, there were differences in the acceptability of on-trail use levels, trail management techniques, and visitor management tactics. Visitors to all three summits exhibited very similar norms concerning off-trail use, trail conditions, and impacts to summit resources. There were some discrepancies between trail impact norms and responses to open-ended questions, suggesting that visitors may not have recognized impacts in the study photographs or did not consider these impacts unacceptable.

Interestingly, visitors reported seeing very high levels of vegetation cover and vastly overestimated actual summit conditions (Table 3). This result presents some interesting challenges for managers. On the one hand, summit resources at Camel's Hump are currently within the range of acceptable conditions identified by visitors; Cadillac Mountain's resource condition is slightly below the standard of acceptability; and current conditions on Cascade fall considerably short of the standard set by visitors. If managers at Cascade wish to provide conditions that are acceptable to visitors, they would need to exert considerable effort to restore the vegetation at the summit and work to bring conditions up to standard. The same is true at Cadillac Mountain, though a smaller improvement in the condition of summit resources would be needed. Likewise, managers at Camel's Hump must be mindful not to let conditions deteriorate.

On the other hand, respondents at all three sites reported seeing summit conditions that were much better than what they judged to be minimally acceptable. Laven et al. (2005) suggest that existing conditions at parks have little influence on the normative standards reported by visitors, and it appears that visitors derive their standards based on different factors. This observation seems to be true for visitors to the mountain summits in this study as well. Farrell et al. (2001) found that wilderness campers' perceptions of ecological impacts differed greatly from judgments made by trained field staff, and concluded: "Campers cannot, therefore, provide managers with accurate objective information about ecological impacts, as defined by recreation ecologists" (p. 247). Given the large differences between what visitors reported seeing during their visit and the extent of vegetation cover on the three summits as determined by digital image analysis, managers at Cadillac Mountain, Camel's Hump, and Cascade should be wary of giving too much weight to visitors' perceptions of the extent and severity of ecological impacts.

Monitoring is an increasingly important component of managing recreation and tourism on mountain summits in the Northern Forest. Indicators and standards of quality can be developed and employed to help define and manage high-quality recreation opportunities and experiences. The results of this study suggest that use levels, resource condition, and management practices are good indicators of quality for mountain recreation experiences. While the results presented in this paper represent a spectrum of mountain recreation opportunities found in the Northern Forest, the specific conclusions and management implications may not be directly transferable to other sites. Managers wishing to establish a recreation-monitoring program for mountain summits should conduct a program of research to develop appropriate and context-specific indicators and standards of quality.

5.0 CITATIONS

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*MEANINGS AND MEASUREMENT
OF RECREATION*

THE ROLE OF IMAGINATION IN EXPERIENCING NATURAL ENVIRONMENTS

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Abstract.—The experience of natural environments and places is multifaceted, involving psychological functions such as perception, cognition, memory, emotion, and imagination. Environmental perception and cognition were key topics in early research in environmental psychology. More recently, attention has also been directed to affective dimensions of environmental experience, such as emotion and mood. As yet, however, little attention has been given to the role of imagination in experiencing natural environments and places. The term “imagination” encompasses a diverse set of phenomena, including visualization, dreaming, reverie, and the use of metaphors and symbolism in language and thought. In this paper, I illustrate some ways in which imagination functions in people’s experiences of natural environments, using examples drawn from qualitative, mail-back surveys about special outdoor places in the upper Midwest.

1.0 INTRODUCTION

At some point in our lives, most of us have looked at the sky and used our imagination to spot clouds that bear fanciful resemblances to animals, people, or things. This is one very familiar example of how imagination can enter into our experience of the natural world.

Not only clouds, but all kinds of natural shapes and forms, are able to evoke or activate imagination. On the photo-sharing website, Flickr (www.flickr.com), there is a popular group called “Accidental Hidden Faces in the Natural World,” where people have posted hundreds of pictures of natural scenes, including trees, rock formations, flowers, and clouds, that seem to contain human faces (for example, Fig. 1). Sometimes these “hidden faces” in natural scenes are not obvious at first, but once you notice one, it can be almost impossible to ignore. When you then view that landscape again, you

might have the eerie feeling that the landscape is looking back at you.

In the novel, *The Woodlanders*, Thomas Hardy (1906) describes a forest scene as evening approaches:

... as the hour grew later, and nine o’clock drew on, the irradiation of the daytime became broken up by weird shadows and ghostly nooks of indistinctness. Imagination could trace upon the trunks and boughs strange faces and figures shaped by the dying lights; the surfaces of the holly-leaves would here and there shine like peeping eyes, while such fragments of the sky as were visible between the trunks assumed the aspect of sheeted forms and cloven tongues (p. 143).

This description calls to mind the mysterious “Green Man” (Anderson 1990), a traditional motif in the ornamentation of medieval European churches, which depicts an enigmatic face peering out from a thicket of foliage (Fig. 2). Perhaps this tendency of the human



Figure 1.—A “hidden face” in the trunk of a tree, from the Flickr website. (Photo used with permission by Pavel N. Matustik)



Figure 2.—The Green Man in Winchester Cathedral. (Photo used with permission by Miles Sabin)

mind to perceive human faces in the complex forms of nature has contributed to the development of myths and traditions about spirits that inhabit natural places like forests and mountains.

These examples make it clear that imagination does play a role in how we experience natural environments, but research in environmental psychology has not paid much attention to imagination. Early studies in the field focused to a large extent on environmental perception and cognition. Despite more recent interest in affective and emotional aspects of environmental experience, there is little empirical research on environmental imagination.

Part of the reason for this lack of research may be that imagination is a difficult concept to define precisely. The word “imagination” as it occurs in everyday speech is ambiguous and is used in several quite different ways. It can refer to visual imagery, to fantasy and reverie, to creativity and inventiveness in thought and action, and to the use of metaphors and symbolism in writing and speech. It is not clear whether all of these meanings are related to each other in any essential way. Another difficulty is that imagination appears to have close connections to other psychological functions, such as

perception, cognition, and memory (Thomas 2005). It is not easy to say whether imagination is truly a distinct mental faculty and, if it is, to identify what distinguishes it from other processes of the human mind.

The role of imagination in human life has been a subject of debate in philosophy and psychology dating back at least to the ancient Greeks. Little consensus has been reached about just what imagination is and whether it is a useful concept for philosophical and scientific inquiries into human nature. Several contemporary authors have attempted to delineate the character of imagination in human experience, to organize and synthesize disparate accounts of its nature, and to establish its standing as a distinct and essential faculty of the human mind (Murray 1986, Brann 1991, Casey 2000, McGinn 2004).

I will not attempt to review or characterize the debate over imagination here. For the purposes of this paper, I will adopt a basic definition of imagination taken from the American Heritage Dictionary. Imagination is “the formation of a mental image or concept of that which is not real or present” (Morris 1969, p. 657).

2.0 METHODS

My purpose in this paper is to illustrate some of the ways in which imagination appears in people’s experiences of natural environments, using examples from a series of qualitative, mail-back surveys in which people wrote descriptions of special outdoor places. The surveys were carried out between 1986 and 2001 in five locales in the upper Midwest, ranging from urban and suburban locations in the Chicago metropolitan area to rural and wilderness settings in the Northwoods of Wisconsin and Michigan. The participants were self-selected residents of and visitors to these areas. They were asked to think of outdoor places that were important or special to them personally and to write descriptions of these places explaining what made them special. The 115 participants wrote a combined total of 358 descriptions of special places (Table 1). I did a qualitative analysis to identify common themes in their responses. Details of the methods, analysis, and findings can be found in several earlier papers (Schroeder 1991, 1996, 2000, 2002, 2004).

Table 1.—Special places surveys

Location	Date	Respondents	Number of Respondents	Number of Place Descriptions
Morton Arboretum, Chicago, IL, suburb	1986	Arboretum members and volunteers	29	126
Black River, MI	1993	Residents and visitors	24	66
MI Upper Peninsula	1996	Commercial woodland managers	15	36
Chequamegon Area, WI	1996-1997	Residents and visitors	21	53
Lake Calumet Area, Chicago	2000-2001	Residents and visitors	26	77
			115	358

I did not set out to study imagination in these surveys, but as I read through the responses, I began to notice that some people's descriptions of their special places included imaginative impressions or experiences of things that were not actually physically there. I thought that that result was interesting, so I included "imagination" as one theme in the analysis. Thus, what I present in this paper is just one part of a larger analysis of place experience.

3.0 RESULTS

Below, I present several themes pertaining to imaginative aspects of place experience, illustrated with quotations from the special-places surveys. The themes are not mutually exclusive, but overlap and are interwoven throughout the place descriptions. Thus, some of the quoted passages illustrating one theme could have been used to illustrate other themes as well.

3.1 Mental Editing

In describing their special places, some people seemed to engage in a kind of mental editing of the landscape, by using their imagination to add features to complete or fill out the scene. It was as if they were trying to make the scene match an ideal image they had in their mind. Following are examples from three respondents.

Needs one clump of cattails? Very open view.
Like a picture - needs some horses or deer, and dragonflies.

I then turn around and look back down the hill toward Meadow Lake, imagining deer using this trail.

I envision a cabin behind me, and an old, rickety pier on the water.

Sometimes they would take one feature of the landscape and expand it in their mind to cover a larger area. This exercise of the imagination was usually done with parts of the environment that were remnants of larger, former natural habitats. They were using their imagination to restore those remnants to their original extent.

Looking at the old-growth trees and imagining the land covered with them.

The prairie in fall ... Makes me wish I could wave a wand and just open my eyes and see one direction like this all the way to the horizon.

3.2 Time Travel

One form of imagination that showed up frequently is what I call "time travel," in which a person uses the environment as a vehicle for traveling in time, usually back to an earlier era.

The setting plays time tricks with my imagination. I pretend the area is an open savannah of years ago. The Oaks represent a stopping place to relax or take roots. Or possibly, it is years later and cows, tails swatting flies from their backs, lie under the trees' great shade.

Time travel may involve going back to an earlier period in the person's own life.

Perhaps the wild garden means a great deal to me because it was my stepping stone into a bit of past, with the woodland flora of my childhood abundant.

I turn off the fax, the phone, ... the TV, the customer calls, kiss the wife goodbye for a week, and travel back in time to my special place.

Clearly, this form of imagination is closely related to memory, but in these cases it appears to me that people are not merely remembering previous events from their lives in a detached way. Rather, they are using the present environment to help them actually recapture an experience from an earlier period of their life.

Sometimes people travel further back in time than their own life, to experience earlier historical time periods. Again, they appear to be doing more than just thinking or learning about history in an intellectual way. They are seeking to actually experience in their imagination what an earlier era was like.

A place where we go that the “peace” and natural beauty almost takes me back in time to Indians and original settlement.

Would take ... a lot of imagination to put you back in the pioneer days. I enjoy the prairie for the sense of history that it imparts.

Some people wanted to be able to reenact the experience of people who lived in those earlier times.

Wanting ... to have the opportunity to ... reenact experience of those first to discover the river/falls/natural harbor setting.

I felt like a land-looker of 100 years ago searching for King Pine. It meant an opportunity to step back in time and experience the old days.

For some respondents the focus of time travel was on returning to earlier ecosystems that have now mostly vanished. As I mentioned before, they often used their

imagination to expand a small remnant of that ecosystem to cover the whole landscape.

This area is a remnant of a once-vast deciduous woods of the East. I feel its constant rhythms, and sense our heritage when centuries ago the forest was our home.

Another flashback in time. I’m always trying to envision a vast horizon of native prairie.

3.3 Travel to Other Places

People do not use their imagination just to travel through time, but also to travel through space, to experience other places at a distance from their actual location. For example, when visiting natural places in the urbanized Chicago area, some individuals would imagine that they were in some other place, distant from the city.

It’s a backwater dammed by beavers in the past. It’s like going into southern Illinois. Peaceful, quiet, minimum human impact ...

This view takes me back to the calm waters of a Northwoods lake.

The places where people traveled in their imagination were themselves sometimes imaginary, perhaps from a work of fiction they had read.

The picture in my mind that it reminded me of, probably came from reading fairy-tales: The little old wood-cutter and his wife, who were always simple, honest, good people.

The story of “Heidi” – I’ve always wanted to live on the mountain, and this view only needs a tiny village, near the pond, to be the picture in my mind from reading the story.

(Note how the latter respondent uses imagination to mentally edit the landscape, adding a village to the scene to make it correspond to her image of a place she read about in a book.)

For some people, being in their special place is like traveling to a whole different world.

A place not too far from home that when I'm there can take me to other worlds.

Within the mountains is a passageway that allows entry into paradise.

Imagination comes into play not only when people are at their special places, but also after they have left and returned home. Imagination gives them a way of revisiting and re-experiencing their special place from afar.

I can see every inch of the area as if I were there only yesterday.

The knowledge that it's waiting gets us thru [sic] the long crummy big-city winters. We put on videos of summers past & take mini-vacations all thru [sic] January & February.

3.4 Personification

A final way in which imagination appeared in participants' descriptions of their special places is through personification of the natural environment. The environment or some part of it is imagined to be like a person in some way. Nature as a whole is, of course, often personified as Mother Nature.

There is nothing but you and Mother Nature in her fullest glory.

We love and respect it and fervently hope it is not improved to death. Let Nature do what she does so well.

Particular natural things or features may also be imagined in human terms.

The wind is the artist's hand on the drifts as the snow takes on random patterns and blows random designs.

The pines and their carpet of brown needles and especial quality of silence. ... the feeling of a

like-minded group of people waiting on God in worship.

The hidden faces in nature mentioned in the introduction to this paper are another example of personification of nature. When people glimpse one of these whimsical faces, they are in some sense personifying the natural environment – literally giving it a human face.

4.0 CONCLUSION

These examples from the special-places surveys suggest that the faculty of imagination can come into play in experiencing natural environments in a variety of ways, and may be a significant aspect of how people find meaning in places that are important to them. This dimension of the human-environment relationship deserves more attention from researchers in environmental psychology and related fields. In addition to surveys and interviews designed to draw out imaginative aspects of environmental experience, analyses of literary works, nature writings, and a variety of culturally significant images and texts could help to identify how imagination enters into the development and expression of environmental meanings and values. The role of imagination in environmental decision-making could also be explored using such methods as process tracing.

In a more practical vein, recreation and environmental managers should also recognize that imagination can be a means for arousing people's interest in natural environments and fostering a sense of meaning and connection with outdoor places. Many nature educators and interpreters evidently understand this relationship and are already making use of imagination in their programs in a variety of ways. For example, the U.S. Forest Service has a program for archeology volunteers called "Passport in Time." Volunteers carry "passports" that are stamped every time they arrive at a work site, thus evoking the imaginary notion of time travel. Future research to identify the forms of imagination that are most engaging to people in experiencing nature could help to support the development of education and interpretation programs to foster meaningful connections between people and natural environments.

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*CLIMATE CHANGE AND
RESOURCE PLANNING*

ARE THE KEYS LOVED TO DEATH? A STUDY OF DIVER SPECIALIZATION LEVELS AND PREFERENCES IN THE FLORIDA KEYS

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Abstract.—This paper presents research conducted for the Florida Reef Resilience Program on nonresident recreational SCUBA divers in three zones of the Florida Keys. When divers were segmented into specialization subgroups for analysis, divers in different subgroups tended to use different geographic locations. These results suggest differences in user preferences; yet when social norms such as perceived crowding were included in the analysis, there were no significant differences across specialization levels. Nonresident divers may be motivated by nonsocial drivers, which has important implications for recreation management decisions and strategies that are based on social carrying capacity. Results also suggest that nonsocial factors such as resource conditions may have an important influence on selection of dive locations and satisfaction with the diving experience.

1.0 INTRODUCTION

Natural resource managers make management decisions based on institutional mandates that have both ecological and social components, providing the basis for integrated resource management (Weinstein et al. 2007). Recreationists' goals and social preferences for different aspects of 'the experience,' along with biological and ecological considerations, guide most coastal and coral reef management strategies and actions. Integrating social and biological research findings across the system helps achieve a more focused understanding of reef use, perceptions, impacts, and health (Mascia 2003). Motivations for user preference have long been incorporated into *terrestrial* resource management (Manfredo et al. 2009), allowing managers to adopt or adapt strategies that balance use with conservation efforts. This study aims to provide this kind of

information to managers of the *marine* resource system of the Florida Keys.

The Florida Keys attracts millions of visitors annually. Identifying the drivers behind visitors' geographic or site choices can help to determine social carrying capacity. The Keys are sometimes said to be 'loved to death,' implying that managers have not been successful in balancing resource protection with recreational demands. Coral cover has declined dramatically over the last 12 years, including an overall loss of 44 percent of hard coral species at quantitatively surveyed monitoring stations throughout the Keys (Waddell and Clark 2008). The threats facing the Florida Keys reefs are both biophysical (rising sea levels and temperatures) and anthropogenic (overfishing, anchor damage, and coastal development). It is therefore important to look at recreation and resource use patterns in the Keys in order to understand the public's needs more completely.

Integrating biophysical assessments of resource conditions with social preferences may help to determine whether there is an ecological component to coral reef use levels. This study aims to investigate whether social drivers can be combined with visitor perceptions of ecological conditions to help guide management actions within the reef system. By using conceptual frameworks such as specialization theory and normative theory, we hypothesize that the satisfaction of the most highly specialized user groups must be the basis for determining carrying capacity to fully achieve management mandates.

2.0 METHODS

The data used in this analysis are a subset from the Florida Reef Resilience Program (FRRP) umbrella project (described in Loomis et al. 2008a, 2008b, and 2008c). One of the main purposes of FRRP was to integrate biological and social data to support management strategies and actions and to generate feasible management alternatives. To assist with these efforts, the Keys were subdivided into Lower, Middle, and Upper Keys to allow comparisons throughout a

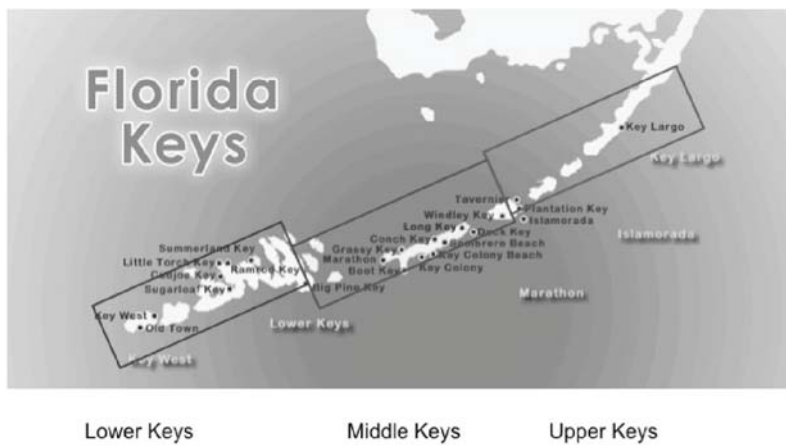


Figure 1.—Zonation of the Florida Keys for all FRRP data collection efforts.

large geographical area (Fig. 1). The divisions were determined by the FRRP working group before data collection began and were used in both biophysical and social investigations. The divisions were based upon natural breaks in islands, tidal flow, and biophysical characteristics (see sidebar). Every attempt was made to ensure that a representative sample of divers was collected from each geographic area.

Data were collected from anglers, divers, and snorkelers in the Florida Keys between June 2006 and July 2007 via a mail survey. To ensure a representative sample, names and addresses were collected through intercepts of people participating in a diving activity. Intercepts took place during approximately 1 week of each month during the 13-month study period. Students from the University of Massachusetts conducted the intercepts both in the

water and on land throughout the Florida Keys on weekdays, weekends, and holidays throughout the year. To maximize response rates for the survey, materials were sent out using the Dillman (1978) and Dillman et al. (2009) Total Design Method. These efforts resulted in a response rate of 57.9 percent and an overall sample size of 1,590. This paper uses data only from nonresident divers ($N = 875$).

The 16-page survey instrument was developed cooperatively with members of the FRRP working group over 4 months. Questions covered a variety of human dimensions concepts related to snorkel and dive norms, motivations, expectations, accomplishments, satisfaction, equipment expenditures, levels of media interaction, attitudes towards coral reef use, and evaluations of biological conditions. Basic demographic data included

Sidebar. Subdivisions of the Florida Keys

Upper Keys

The Upper Keys sub-region extends from just south of Biscayne National Park down to Lower Matecumbe Key. The islands of the Upper Keys are close together, forming a nearly continuous chain that limits tidal water exchange between the Atlantic Ocean side of the islands and the Florida Bay side. The Gulf Stream also frequently loops in close to this sub-region. The combination of these factors usually results in very good visibility.

Middle Keys

The Middle Keys sub-region trails southwest from the Upper Keys sub-region encompassing the area from the south end of Lower Matecumbe Key to Bahia Honda Key. The Middle Keys are widely separated, allowing major tidal flow between islands from Florida Bay and the Gulf of Mexico to the Atlantic Ocean.

Lower Keys

The Lower Keys sub-region extends west from Bahia Honda Key out past Key West but stopping shy of the Marquesas Keys. This area has many more and much wider keys with island orientation in a northwest to southeast direction. These wide land expanses have shallow bays between keys, slowing tidal water flow. There are a few deep water passes that allow more tidal flow.

Table 1.—Number of nonresident divers in each specialization category

	Least specialized	Moderately specialized	Highly specialized	Very Highly specialized	Totals
N	30	217	378	250	875
% of Total	3.4	24.8	43.2	28.6	100.0

respondents' gender, age, race, ethnicity, income, and place of residence. The survey instrument also included questions to incorporate and test specialization theory based around the four social world dimensions of orientation, experiences, relationships, and commitment (Ditton and Loomis 1992). The specialization index developed and validated by Salz et al. (2001) was used to categorize nonresident divers into meaningful subgroups. Initially four specialization levels ranging from low to high were used, as suggested by the theory. However, the number of nonresident divers in the least specialized category (30) was too small to provide robust results. Subsequently only nonresident divers that fell into the 'moderate,' 'high,' and 'very high' specialization categories were used for the analysis (n = 845; Table 1). The concentration of divers at the higher levels of specialization implies both dedication to, and investment in, the sport of diving.

3.0 RESULTS

Respondents were asked to indicate how many SCUBA divers, snorkelers, and boats they considered it acceptable to see at a time at a dive site. Figures 2, 3, and 4 show the norm curves for the acceptable number of divers, snorkelers, and boats, respectively. The peaks of the curves are directly above the most acceptable number of encounters (on average). For resource managers and others interested in social carrying capacity, the critical piece of information is where each curve crosses the neutral point on the acceptability scale (anything above 0 is acceptable, and anything below 0 is unacceptable). For this study, the average maximum number of acceptable encounters per category was 12 SCUBA divers, 14 snorkelers, and eight boats. Note that each encounter category was tested separately, so no conclusions can be drawn from the data about how many encounters with a combination of divers, snorkelers, and boats might be acceptable.

Expectations for how many other users divers might see at a time—which is different from what is considered to be acceptable—varied across the sample. Eighty-seven percent of nonresident divers expected to see 10 or fewer snorkelers (mean = 5.44), 77 percent expected to see 10 or fewer other SCUBA divers (mean = 8.98), and 97 percent expected to see 10 or fewer boats (mean = 3.54). Only 60 percent reported actually seeing 10 or fewer snorkelers (mean = 14.00) while 94 percent reported seeing 10 or fewer SCUBA divers (mean = 4.44) and 82 percent reported seeing 10 or fewer boats (mean = 6.80). The average numbers of divers, snorkelers, and boats actually seen are marked with arrows on Figures 2, 3, and 4.

Crowding is a subjective negative evaluation of use levels that occurs when a recreationist perceives that others are interfering with his or her own activities. In general, nonresident divers in this study experienced little perceived crowding. Approximately 24 percent of all respondents felt "not crowded at all" during their most recent trip (mean = 3.17) on a scale of 1 to 9 with 9 being the most crowded, whereas only 1 percent felt extremely crowded. This result suggests that nonresident divers are generally satisfied with current use levels. It also suggests that adjustments in management decisions to allow higher levels of use in some areas may have some effect on future levels of perceived crowding. Perceived crowding was also analyzed by geographic subdivision (Table 2).

The satisfaction that individuals derive from various aspects of their trip can be better understood by studying their pre-trip expectations, what actually occurred during the trip, and how satisfied they were with the experience afterward. Respondents were asked to rate their satisfaction levels with various aspects of their diving experience (e.g., "healthy reef," "large fish," and "visibility") on a 5-point Likert scale ranging from extremely negative through a neutral point to extremely positive. Table 3 displays the mean values for some of

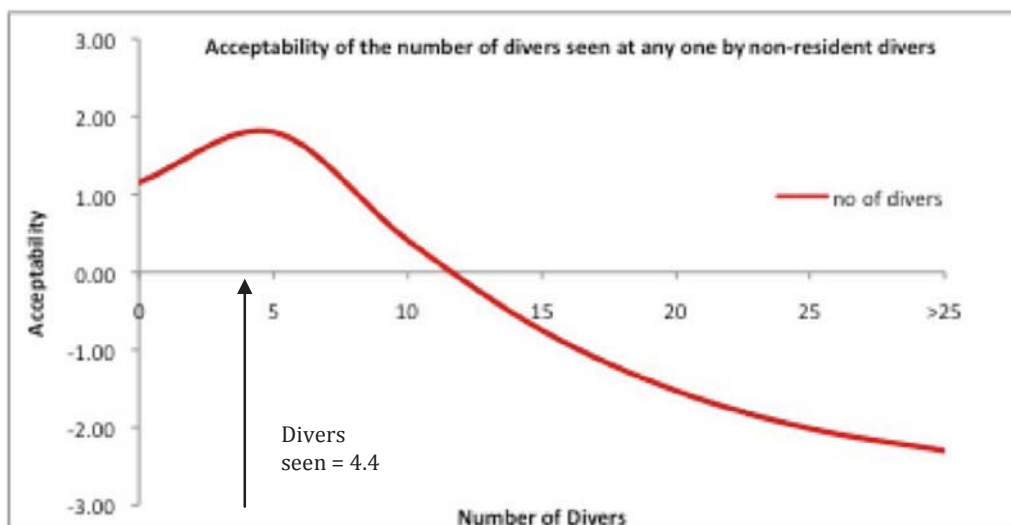


Figure 2.—Norm curve for the acceptability of encountering other divers.

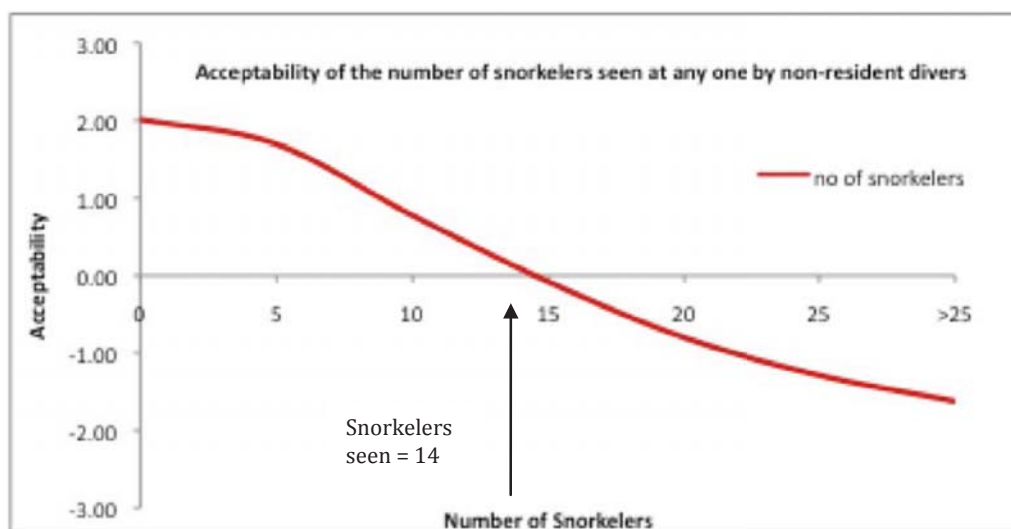


Figure 3.—Norm curve for the acceptability of encountering snorkelers.

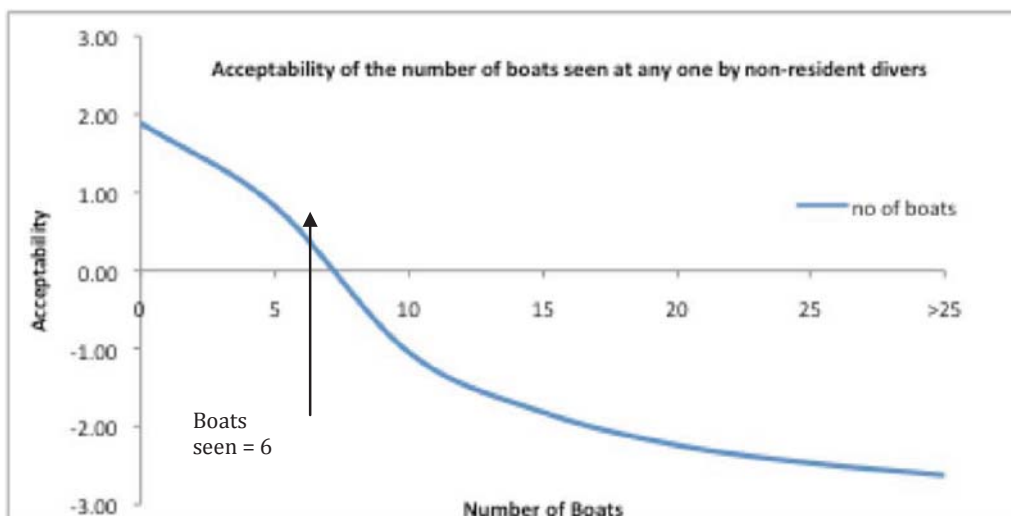


Figure 4.—Norm curve for the acceptability of encountering boats.

Table 2.—Diver distribution and perceived crowding by zone

	Lower Keys	Middle Keys	Upper Keys	Overall
Percentage of nonresident divers	23.9%	16.5%	59.6%	100%
Perceived crowding level*	3.1	2.9	3.5	3.2

* On a scale of 1 to 9, with 9 being the most crowded.

Table 3.—Mean satisfaction scores with resource condition by zone (all divers)

	Lower Keys	Middle Keys	Upper Keys	P-Value
Healthy reef	3.09	3.38	3.64	0.000
Easy diving	3.37	3.68	3.82	0.000
Undamaged reef	3.03	3.26	3.51	0.000
Marine life	3.47	3.64	3.91	0.000
Large fish	3.12	3.13	3.53	0.000
Live coral	3.28	3.51	3.73	0.000
Visibility	3.28	3.51	3.73	0.000
Unique underwater formations	3.21	3.31	3.56	0.000

Means shaded the same color are not significantly different ($\alpha = 0.1$) using Tukey's test. Scores were on a scale of 1 to 5, where 1 = extremely negative and 5 = extremely positive.

the items that can be linked to resource condition; these particular findings are presented to highlight differences that may explain the obvious geographic preference for the Upper Keys noted in Table 2.

Results were then cross-examined by the specialization level categories discussed above. Diver distribution was determined by geographic subdivision and by specialization level. In general, more highly specialized divers are both more resource-dependent and more likely to conform to regulations (specialization proposition numbers 6 and 4; Ditton and Loomis 1992). Therefore, the most highly specialized divers are generally used as the management benchmark. With this in mind, satisfaction with resource condition was then recalculated for just the most highly specialized divers (Table 4).

4.0 DISCUSSION AND CONCLUSIONS

The data show that divers in different specialization groups tend to favor different geographic regions of the Keys (Chi-square $p = 0.000$, $N = 875$). Further investigation shows that the Upper Keys are the most crowded, in terms of both perceived crowding and actual use levels. However, when data from all locations were taken together, there were no significant differences

with regard to crowding among divers in different specialization levels. In other words, the most specialized divers are not more likely to perceive crowding even though they are more likely to dive in places with higher use levels. This finding suggests that use levels in the Keys are generally not high enough for crowding to affect divers' satisfaction with the diving experience, even at the locations with the highest use levels. For recreation managers, the implication is that social carrying capacity of a location or area should not be the sole driver of management decisions. Although FRRP has explored alternate factors such as behavioral norms and access, ever-changing social conditions such as the economic downturn have created a need for further investigation.

Significant differences exist between both perceived and actual resource quality throughout the Keys, as shown in both this study and a separate biophysical investigation by Waddell and Clarke (2008). The Upper Keys attracted the most highly qualified divers and received the best satisfaction ratings among nonresident divers in this study. Significant differences were reported when comparing the Lower and Middle Keys condition with that of the Upper Keys on seven of the eight attributes. Although these differences were less significant when

Table 4.—Most-specialized divers' satisfaction with resource condition

	Lower keys	Middle keys	Upper keys	P-Value
Healthy reef	2.97	3.40	3.57	1.014
Easy diving	3.84	3.89	3.93	0.860
Undamaged reef	2.90	3.23	3.36	0.096
Marine life	3.58	3.69	3.87	0.167
Large fish	3.19	3.06	3.46	0.116
Live coral	3.29	3.54	3.67	0.144
Visibility	3.39	3.34	3.73	0.055
Unique underwater formations	3.36	3.34	3.53	0.482

Means shaded the same color are not significantly different ($\alpha = 0.1$) using Tukey's test.
Scores were on a scale of 1 to 5, where 1 = extremely negative and 5 = extremely positive.

analyzing the results of just the most specialized divers, it does suggest that the Lower Keys may be falling victim to the 'loved to death' phenomenon.

This study highlights the need to look more closely at recreational users' values regarding acceptable ecological conditions. This focus may allow managers to determine whether, and where, high recreational use levels can be concentrated to conserve natural resources at other sites. Managers also need to know in advance whether recreationists would be willing to support such measures, and they need to understand what is important and acceptable to different user groups to reduce the possibility of major conflicts over use.

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The content of this paper reflects the views of the authors(s), who are responsible for the facts and accuracy of the information presented herein.

DIVER PERCEPTIONS OF FLORIDA KEYS REEF CONDITIONS BY SPECIALIZATION LEVEL

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Abstract.—Understanding different user-group values, preferences, and perceptions can lead to more efficient and effective management decisions, reducing conflict and helping to balance eco-societal goals. User perceptions of reef condition, ecological health, and impacts to reefs can provide valuable information to managers on motivations, values, willingness to comply with regulations, satisfaction of experience, and potential sources of conflict. Perceptions and values within user groups are heterogeneous in terms of motivations, satisfactions, and characteristics. Specialized divers tend to have more specific resource requirements. This study uses specialization theory to subdivide divers in the Florida Keys into meaningful specialization categories to achieve a more sophisticated understanding of diver perceptions of reef condition. The responses to six structured questions were analyzed to assess perceptions of ecological health and impacts to reefs. Overall, the survey results were varied, with only highly specialized divers showing significantly different responses to hypothetical variations in reef condition.

1.0 INTRODUCTION

Coral reefs are recognized as having significant biological, social, and economic value to both the communities they support and wider society (Cesar 2000). Managing areas of reef to meet both ecological and user demands presents a complex challenge. When environmental and recreation managers understand different user-group values, preferences, and perceptions, they can make decisions that promote more efficient and effective resource management, reduce conflict, and help to balance ecological and societal goals. User perceptions of reef condition, ecological health and impacts to

reefs can provide valuable information to managers on motivations, values, willingness to comply with restrictions, satisfaction of experience, and potential sources of conflict. For example, it would be very difficult to enforce a no-access regulation based on ecological criteria to an area that users perceive to be in good condition. Perception of resource condition and acceptability of different reef conditions can also be used for monitoring social carrying capacity and the shifting baseline of resource acceptability. However, information relating to individual user groups may be insufficient. Even within a user category, such as divers, values differ significantly. This study uses recreational specialization theory to group divers into different specialization levels and investigates whether these groups have different perceptions of reef condition, ecological health, and impacts on reefs.

Recreation specialization theory (henceforth referred to as “specialization theory”) was first proposed by Bryan (1977), later refined by Ditton et al. (1992), and subsequently used as a framework to investigate a variety of natural resource conservation issues. (For a selection of applications, see Dearden et al. [2006], Mangun et al. [2007], and Oh and Ditton [2008]). Specialization theory postulates that outdoor recreation participants (e.g., anglers, SCUBA divers, boaters) can be placed on a continuum from general interest and low involvement to expert interest and high involvement in a leisure social world. Each level of specialization involves a change in distinctive behaviors, skills, and directions. These include equipment preference, type of experiences sought (goals), desired setting for the activity, attitudes toward resource management, preferred social context, and vacation patterns. The concept of recreation specialization allows researchers to analyze subgroups of populations, rather than aggregate the attitudes and preferences of novice, medium, and advanced participants.

This study used data from divers in the Florida Keys to describe differences in the perception of

resource condition between divers at different levels of specialization. Specialization theory has eight propositions (Ditton et al. 1992), including elements that help characterize users, such as centrality to life, investment in equipment, and willingness to support rules. Proposition 6 states: “As level of specialization in a given recreation activity increases, dependency on a specific resource will likely increase” (Ditton et al. 1992, p. 40). Based on this proposition, we hypothesized that highly specialized divers would rate low-quality habitat as significantly less acceptable than would less specialized divers, who have lower resource dependency. In Proposition 7, Ditton et al. (1992, p. 40) say: “As level of specialization in a given recreation activity increases, level of mediated interaction relative to that activity will likely increase.” Accordingly, we predict that highly specialized divers will be more critical of resource condition and negative impacts because of the divers’ greater levels of mediated interaction.

2.0 METHODS

The data come from a larger project called the Florida Reef Resilience Programme (FRRP), which aimed to integrate biological and social data from the Florida Keys to support management (Loomis et al. 2008). Data were collected from nonresident divers in the Florida Keys between June 2006 and July 2007. To ensure a representative sample, names and addresses of divers were collected through intercepts of people participating in a diving activity. Intercepts began in June 2006 and took place during approximately 1 week of each month during the 13-month period. Intercepts were conducted both in water and on land throughout the Florida Keys. Samples were collected on weekdays, weekends, and holidays throughout the year. To maximize response rates for the survey, materials were sent out using the Dillman (2000) Total Design Method. All participants were mailed a packet of survey materials that contained a cover letter thanking them for their participation and ensuring their confidentiality, a 16-page questionnaire, a business reply envelope, and a map of the Florida Keys.

Questions were designed using the specialization index developed and validated by Salz et al. (2001),

which incorporates the four social world dimensions of orientation, experiences, relationships, and commitment. Initially divers were broken into four specialization levels from low to high, as the theory suggests, but there were no divers in the least specialized category, and only two in the moderate level. Therefore, these categories were combined to create final categories of ‘least,’ ‘moderate,’ and ‘high’ specialization divers.

Four groups of survey questions asked participants to:

- 1) Rate the acceptability of different reef condition scenarios on a 1 to 7 scale, from 1 = extremely unacceptable to 7 = extremely acceptable. Reef condition scenarios presented different percent covers of white coral (bleached, unhealthy), percent algal cover, levels of visibility, and different kinds of fish assemblages;
- 2) Rate the perceived condition of 10 reef features: amount of algae, underwater visibility, color of coral, number of fish, different kinds of fish, size of fish, amount of coral disease, amount of live coral, size of coral, and different kinds of coral. A scale of 1 to 7 was used, with 1 indicating poor condition and 7 indicating good condition;
- 3) Rate the overall perceived ecological health of coral reefs in the Keys, from 1 = poor to 5 = excellent and indicate whether the reefs are declining substantially = 1 to improving substantially = 5; and
- 4) Rate the impacts of natural and human factors (water quality, scuba diving, commercial fishing, hurricanes, snorkelling, recreational fishing, and global climate change) on coral reefs using a 7-point scale, where 1 = extremely negative and 7 = extremely positive.

Statistical software package SYSTAT (Chicago, IL) was used to analyze the data and generate descriptive statistics. Significant differences between groups were identified using the Tukey test for unplanned pairwise comparisons, which helps preserve the family-wise type I error rate with an alpha level of 0.1 and 0.05.

3.0 RESULTS AND DISCUSSION

The FRRP questionnaire had an overall response rate of 57.9 percent and 938 of the participants were nonresident divers. The majority of divers fell into the moderate level of specialization (378 participants, 44.7 percent), 217 (25.7 percent) were in the least specialized category, and 250 (29.6 percent) were highly specialized. The concentration of divers in the moderate and high levels of specialization implies dedication to, and investment in, the sport of diving. The amount of mediated interaction increased significantly as level of specialization increased ($p \leq 0.05$ for each group interaction).

3.1 Acceptability of Different Reef Conditions

When participants were asked to rate the acceptability of different reef condition scenarios, there were significant differences between specialization subgroups (Table 1). Mostly white (bleached) coral, 60 percent white, and 30 percent white were significantly less acceptable to highly specialized divers ($p \leq 0.000$). In turn, reefs with no white coral were significantly more acceptable ($p \leq 0.000$) to highly specialized divers. The results were similar for

algal cover; reef with 100 percent or 60 percent algal cover was significantly more acceptable to less specialized divers ($p \leq 0.001$). Specialization was not related to acceptability of different levels of visibility in this case. Highly specialized divers were significantly more concerned about seeing no fish or few fish compared to less specialized divers (significant with $\alpha = 0.1$).

These results support the hypothesis that highly specialized divers find low quality conditions less acceptable than do less specialized divers. This response indicates a greater degree of resource dependency among highly specialized divers.

3.2 Perceived Condition of Reef Features

In the second group of survey questions, participants were asked to rate the condition of different aspects of the reef on a scale of 1 to 7, where 1 = poor and 7 = good (Table 2). All reef conditions were rated as above average (>3.50); the number of fish received the highest score across groups ($\chi=5.02$). There were no significant differences by specialization.

Table 1.—Acceptability of different reef conditions by diver specialization

	Specialization level			F-ratio	P-value
	Least	Moderate	High		
Coral mostly white	3.34	2.82	2.08	24.932	0.000
Coral 60% white	3.46	3.00	2.29	28.870	0.000
Coral 30% white	3.79	3.55	3.09	13.650	0.000
Reefs with no white coral	4.95	5.25	5.80	12.483	0.000
100% algal cover	2.65*	2.43	2.09	6.927	0.001
60% algal cover	3.10*	2.90	2.52	9.224	0.000
30% algal cover	3.92	3.74	3.32	1.488	0.226
No algae present	5.27	5.49	5.54	1.537	0.216
Vis. 10 feet	2.41	2.29	2.39	0.572	0.564
Vis. 25 feet	4.21*	3.94	3.89	2.698	0.068
Vis. 50 feet	5.98	5.77	5.81	2.556	0.078
Vis. 75 feet	6.68	6.61	6.68	0.828	0.437
No fish	1.39	1.45	1.24	5.106	0.006
Many fish, few kinds	3.72	3.79	3.52	2.525	0.081
Few fish, many kinds	4.38	4.49	4.12	5.431	0.005
Many fish, many kinds	6.82	6.82	6.87	0.742	0.476

BOLD = significantly different ($\alpha = 0.1$) using Tukey's test.

* = Significant difference between least and highest.

Table 2.—Divers' perceptions of the condition of reef features by specialization

	Satisfaction Level			Mean across specialization	F-ratio	P-value
	Least	Moderate	High			
Amount of algae	4.64	4.55	4.43	4.54	1.855	0.157
Underwater visibility	4.83	4.61	4.82	4.75	2.261	0.105
Color of coral	4.48	4.59	4.54	4.54	0.524	0.593
Number of fish	4.97	5.09	4.99	5.02	0.778	0.460
Different kinds of fish	4.95	5.02	4.96	4.98	0.289	0.749
Size of fish	4.73	4.80	4.70	4.74	0.400	0.670
Amount of coral disease	4.19	4.05	4.06	4.10	1.044	0.353
Amount of live coral	4.64	4.72	4.61	4.66	0.507	0.602
Size of corals	4.59	4.72	4.57	4.63	1.186	0.306
Different kinds of coral	4.51	4.75	4.70	4.65	2.218	0.109

Table 3.—Divers' perception of ecological health and trend in health by specialization level

	Specialization level			F-ratio	P-value
	Least	Moderate	High		
Rate ecological condition	2.854	2.919	2.848	0.558	0.573
Rate ecological health	2.41	2.57	2.55	2.331	0.098

BOLD = significantly different ($\alpha = 0.1$) using Tukey's test.

* 1 = Declining substantially, 2 = Declining somewhat, 3 = Staying the same, 4 = Improving somewhat, 5 = Improving substantially

The second hypothesis was that highly specialized divers would rate the overall condition of reefs more critically (lower) than less specialized divers due to their resource sensitivity and higher level of mediated interaction. The data do not support this hypothesis. The specialization proposition may be flawed, or the level of mediated interaction associated with higher specialization groups may not translate into perceived condition scores. This result may also show that there is a difference between responses to *abstract* or hypothetical conditions, as in the previous question, and ratings of *observed* conditions.

3.3 Perceived Ecological Health of Reefs

Participants were asked to rate the current condition of reefs on a scale of 1 (poor) to 5 (excellent). All specialization subgroups responded somewhere between fair and good ($\chi^2=2.89$) and there were no significant differences between specialization groups (Table 3).

Regarding ecological health trends, participants were asked to indicate on a 1 to 5 scale whether reef health was improving, declining, or staying the same. Results show that less specialized divers perceived reefs as being in worse condition and somewhat in decline, as compared to more specialized divers, who rated the reefs closer to "staying the same" ($\chi^2=2.53$).

Data did not support the hypothesis that more specialized divers would rate the condition of reefs as worse than less specialized divers. In fact, the least specialized divers perceived reef health as declining with a significantly lower score ($p \leq 0.098$).

3.4 Perception of Impacts on Reefs

Another hypothesis was that highly specialized divers would rate impacts more negatively than less specialized divers. Participants were asked to rate a variety of possible impacts on a scale from 1 (extremely negative impact)

Table 4.—Divers' perception of impacts to reefs by specialization (7-point scale)

	Specialization Level			F-ratio	P-value
	Least	Moderate	High		
Impact Questions 1					
Water quality	4.22	4.17	4.23	0.112	0.894
SCUBA diving	3.89*	4.12	4.19	2.879	0.057
Commercial fishing	2.78	2.85	2.61	2.846	0.059
Hurricanes	2.48	2.46	2.46	0.016	0.984
Snorkeling	3.84	4.03	4.00	1.649	0.193
Recreational fishing	3.39	3.39	3.20	2.269	0.104
Global climate change	2.82	2.72	2.77	0.353	0.703

BOLD = significantly different ($\alpha = 0.05$) using Tukey's test. * = Significant difference between least and high.

Table 5.—Divers' perception of impacts to reefs by specialization (5-point scale)

	Specialization Level			F-ratio	p-value
	Least	Moderate	High		
Reefs are able to recover easily from commercial fishing damage	2.06*	2.06	1.82	7.095	0.001
Snorkelers/divers cause some damage	3.38	3.28	3.37	0.869	0.420
Recreational anglers cause some damage	3.50	3.39	3.40	1.054	0.349

* = Significant difference ($\alpha = 0.05$) between least and high.

to 7 (extremely positive impact). The impacts were a mix of environmental and anthropogenic factors (see Table 4). There were two significant differences between specialization groups. The least specialized divers gave SCUBA diving a significantly lower impact rating than did more specialized divers ($p \leq 0.057$) (Table 4). Highly specialized divers perceived commercial fishing as having a significantly more negative impact ($p \leq 0.059$).

Finally, participants were asked their level of agreement with statements about reef impacts on a scale of 1 (strongly agree) to 5 (strongly disagree) (Table 5). Most of the answers were consistent across specialization levels. There was a significant difference ($p \leq 0.001$) by specialization level for commercial fishing; less experienced divers were more likely to think that commercial fishing causes damage. The data thus did not support the hypothesis that highly specialized divers would rate impacts more negatively than less specialized divers, except in the case of perceptions of commercial fishing impacts.

4.0 CONCLUSION AND IMPLICATIONS

The divers' survey data provide limited support for the initial hypothesis that because of higher resource dependence and greater level of mediated interaction, highly specialized divers are more likely to rate reef conditions as less acceptable, more degraded, and highly impacted. The first question on the survey presented hypothetical situations of varying resource quality; responses showed the greatest disparity between the specialization levels, as compared to the questions based on observation. High levels of algal cover and coral that was mostly white, 60 percent white, or 30 percent white were significantly less acceptable to more specialized divers. A suggested explanation for this response is that highly specialized divers, having experienced a wider variety of conditions, are better able to envisage the difference between 60 percent and 30 percent algal cover and therefore are more able to distinguish between the suggested scenarios. More specialized divers were also significantly more concerned about seeing no fish or few fish compared to less specialized divers. In terms of

management, these results serve as a useful baseline for monitoring changes in perceptions and acceptability of different condition scenarios. In terms of management implications, the results suggest that there would be a high level of support from specialized divers for initiatives that address decreased coral bleaching, increased fish abundance, and reduced algal cover.

Divers of different specialization levels provided relatively similar assessments of ecological reef health and trends (fair to good and somewhat in decline, respectively). The different diving specialization groups also perceived the suggested impacts to reefs as having a similar level of effect (except for commercial fishing).

These data do not support the hypotheses for a variety of possible reasons. The specialization theory propositions that highly specialized divers are more resource-dependent or that they have higher levels of mediated interactions may be false. Or the links between resource dependency, mediated interaction, and perceived reef condition may be weak. These results may also be explained by the particular characteristics of the user group studied. Diving is an expensive, equipment- and skill-driven recreational activity. There were very few divers in the low specialization category, which may mean that the “spread of specialization levels” is less broad than for other activities, leading to more uniform group perceptions.

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*YOUTH AND OUTDOOR
RECREATION*

THE PERCEIVED IMPACT OF A UNIVERSITY OUTDOOR EDUCATION PROGRAM ON STUDENTS' ENVIRONMENTAL BEHAVIORS

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Abstract.—Outdoor educators often seek to design programs that influence participants' daily lifestyles, especially environmental behaviors. Research on the impact of outdoor education programs on environmental behaviors has typically focused on schoolchildren and teenagers. The purpose of this study was to investigate the perceived impact of a university outdoor education program on the environmental behaviors of program participants. In-depth interviews were conducted with six university students 6 months after they completed a 14-day summer outdoor education course that covered "social, organizational, technical, environmental and educational topics associated with group living, ecology and summer camping skills." Almost all participants reported that the course had some impact on their environmental behaviors. Increased participation in outdoor activities, participation in communal environmental action, and environmental behavior transference to daily life were the most frequently mentioned changed behaviors.

1.0 INTRODUCTION

The impact of outdoor education programs is of interest to experiential educators, recreation practitioners, and leisure researchers. Although outdoor education has many different objectives, outdoor educators often seek to design programs that influence an individual's daily lifestyle and especially environmental behaviors.

The study presented in this paper was part of a larger study that investigated the perceived impact of a university outdoor education course on six university students' environmental attitudes, knowledge, and behaviors. This paper focuses on the impact of the course on the students' environmental behaviors.

Kollmuss and Agyeman (2002) define pro-environmental behavior as behavior "that consciously seeks to minimize the negative impact of one's actions on the natural and built world" (p. 240). Research on the effects of outdoor education programs on environmental behaviors has tended to involve schoolchildren and teenagers. For example, Bogner (1998) found that for 6-months after a 5-day outdoor ecology education program, secondary school students were more willing to engage in environmentally sensitive behaviors. However, Palmberg and Kuru (2000) found that participation in outdoor education activities by elementary school children in Finland did not always lead to environmental actions. These 11- and 12-year-old children most frequently mentioned concrete, local actions such as stopping littering and picking up litter. An Australian study of primary and secondary school environmental education programs found that some students demonstrated behavioral change outside of the learning environment (Ballantyne et al. 2001). Haluza-Delay (2001) discovered that teenage participants in a 12-day Canadian wilderness program expressed concern about the environment but stated that this concern did not translate into action at home. In a study more related to this current study, Freeman et al. (2005) examined a university outdoor education course and observed that the course changed some environmental behavior.

2.0 METHODS

This study investigated the perceived impact of a second-year outdoor education course offered by a Canadian university during the summer of 2007. The bilingual (French and English) course was 14 days long and included a 3-hour indoor session to prepare the students for the trip portion of the course. According to the description, the course was designed to cover "social, organizational, technical, environmental and educational topics associated with group living, ecology and summer camping skills."

A qualitative research design was used because of the small class size (20 students) and the research focus on the perceived course impacts. An email was sent to all students enrolled in the course inviting them to participate in the study. Eleven students requested more information; six students agreed to participate in the research. The sample size was limited because students were unavailable for interviews after the course and because the researcher was a unilingual Anglophone. Some of the Francophone students may have been more likely to participate if they could have been interviewed in French.

The participants were interviewed 6 months after they had completed the outdoor education course. An interview script was used to ask participants to reflect on whether the course influenced their environmental behaviors. Follow-up probe questions were asked to determine the relationships between specific course experiences and environmental behaviors (e.g., What, if any, aspects of the course positively changed your behavior in relation to the environment?). The interviews were audio-recorded and transcribed. Data analysis used the constant comparison technique (Glaser and Strauss 1967). This form of analysis involved reading, rereading, and coding the transcripts, and then comparing and grouping the coded material into themes and sub-themes. To ensure that the interpretation of data was valid, the researcher had her academic supervisor review the transcripts to confirm the themes.

2.1 Participants

Four of the six participants were female and two were male. Only two interviewees, one male and one female, had previously participated in an outdoor education program (Table 1). The female had gone on several short outdoor trips during one academic year for high school physical education credit and the male had completed a 6-day outdoor course. One student was Francophone while the other five were Anglophone. The participants are identified in this paper with pseudonyms.

3.0 RESULTS

In terms of the perceived impact of the course on environmental attitudes, all participants stated that

Table 1.—Characteristics of participants

Participants	Age	Gender	Language	Previous Outdoor Ed. Experience
Abby	21	Female	English	No
Brianne	22	Female	English	No
Colin	27	Male	French	Yes
Dave	22	Male	English	No
Erin	22	Female	English	Yes
Faye	21	Female	English	No

their attitude towards the environment became *more* positive following the course. Even those who already had a positive attitude before the course reported an improvement in their environmental attitude. In particular, the 48-hour “solo” on the 11th and 12th nights of the course and the peacefulness that the students experienced in nature influenced changes in their environmental attitudes. Most knowledge gain was in the areas of personal survival skills (e.g., fire building, navigation) and self-knowledge (e.g., confidence).

Qualitative data analysis of the interviews for this study found that almost all participants reported that the course had some influence on their environmental behaviors. Increased participation in outdoor activities, participation in communal environmental action, and environmental behavior transference to daily life were the main themes observed in the data.

3.1 Increased Participation in Outdoor Activities

After completing the outdoor education course, several participants indicated that they had become more active outdoors through increased participation in activities such as whitewater rafting, kayaking, running, and canoeing. For instance, when asked about the long-term impacts of the course, Colin said:

I’m going outdoors more than I did usually and I just bought my first pair of hiking boots and each weekend

I go into the woods for like 2 hours just to calm down and everything, because you know in the city you have to go very fast.

Similarly, Faye stated:

I have started taking up more outdoor sports, like by the water. I started doing white water rafting...And I have just been running a lot outdoors and it [the course] has just had a very positive effect on what I do.

In general, participants reflected on their course experience and expressed a desire to engage in nature-based activities in order to enjoy a stress-free environment.

3.2 Participation in Communal Environmental Action

Nearly all the participants mentioned taking part in a shoreline clean-up that one student from the class organized about a month after the outdoor education course. Most said that they would participate in such an effort again. The following is a description of the clean-up by Brianne:

About a month after we did our trip, we did a shoreline clean-up. We went and we did a whitewater section of the ... River. Like I would definitely whitewater raft, like I've done it before I went on this trip, but it just, it meant a lot more to me to be cleaning up the environment and like getting rid of waste. I was like, "Sure, I'll go pick up the garbage for a day" and it ended up being a great day and I'll do it again.

Erin also mentioned the shoreline clean-up when asked about the long-term impact of the outdoor education course:

I am more involved in like, protection and stuff. Like a bunch of us from the course did a shoreline clean-up about 4 weeks after the course ended and we actually went out whitewater rafting and cleaned up all the pathways that the whitewater rafters used and they left a lot of garbage. So I think that people like that, in a commercialized kind of sport, really need to be conscious of what they're leaving behind because it really adds up. We found a lot.

While taking the course influenced the students' participation in the clean-up, most said they would not have participated unless someone in the group had shown initiative. When asked if he would have participated in the cleanup had he not taken the course, Dave responded, "Absolutely not." Erin added to this response by stating, "No, just because it was organized by people on the trip and I wouldn't have heard about it. So it is a collective attitude that really gets you involved." Thus, the communal nature of this environmental action was an important reason for their participation in it.

3.3 Transference to Daily Life

Participants explained that many of the behaviors learned during the course were easily applied when they returned to the city. Examples included the transferring "Leave No Trace" and "Reduce, Reuse, and Recycle" behaviors, as well as adopting environmentally friendly transportation habits.

3.3.1 Transference of *Leave No Trace*

The most common responses related to the transference of the *Leave No Trace* camping behaviors they learned during the course. For example, Abby stated, "My behaviors changed in general, as I mentioned, no littering and pollution. You can't leave anything behind." Likewise, Faye commented:

Maybe things like picking up after yourself, like if you go to a park, like little things, not to litter. Very, very tiny things that I am a little bit more picky on now because I know that eventually if one person does it, then everyone is going to do it and then you just sort of create this downfall.

3.3.2 Three R's

Other behavior changes that were mentioned included the "three R's"—recycling, reducing, and reusing items; composting waste; using biodegradable items; and limiting water and electricity use. Abby noted:

It [the course] changed me enough to know that things need to be done and that you really have to take care in what you do and try to use more recyclables, sort of things like the Tupperware

containers, instead of plastic bags, as they're bad for the birds.

Brianne made many lifestyle changes after completing the outdoor education course:

I find that I am a label reader and I'm trying to compost and I'm just being a little bit more environmentally friendly. I bought biodegradable dog-poo bags. I have noticed that I've tried to make a little bit of a difference in my habits that I didn't really appreciate before.

Illustrative of the course's long-term impact on Brianne's environmental behaviors, she was able not only to maintain her own behaviors but also to improve those at her workplace:

Like at work, actually, I work at a restaurant and we never recycled and it drove me nuts, and so I remembered being like, "Do you understand what you're doing to the environment?" I talked to the boss and now we recycle.

3.3.3 Transportation Habits

A third area of transference to daily life was in transportation habits. Participants changed their behaviors in relation to carpooling, taking public transit, and relying on their legs (walking, bicycling). For example, Dave explained his commitment to these behavior changes:

Not driving my car as much and taking public transportation, although I've kind of always taken the bus, but like I walk to the bus now instead of taking the car, and park and ride. But it's like a 15-minute walk, so even on a cold day, it's not that bad, and sometimes I just run it, so it's like 5 minutes.

4.0 DISCUSSION AND CONCLUSION

In this study, the participants reported at least minor changes in their environmental behaviors after the outdoor education course. These results are consistent with Ballantyne et al. (2001), who found that behavior

changes occurred outside of the learning environment, and Bogner (1998), who found that students were more willing to engage in environmentally sensitive behaviors after participation in ecology education programs. However, this finding is not consistent with Haluza-Delay's (2001) result that concern about the environment on an adventure trip did not translate into action at home. Explanations for differences in the findings could be a function of differences in the age of participants (participants in Haluza-Delay's study were teenagers) and the types of programs. Haluza-Delay studied a 12-day adventure wilderness trip, not a university outdoor education course.

The findings of the current study appear to support transfer-of-learning theory, especially in relation to the themes of increased outdoor activity participation and the transference of "Leave No Trace" and "three R's" behaviors. This theory refers to "the application of knowledge learned in one setting for one purpose to another setting and/or purpose" (Leberman and Martin 2004, p. 173). The finding concerning the importance of communal environmental action is consistent with findings from studies of expeditions and trips that demonstrate developing social networks positively influences subsequent social activism (McGehee 2002).

Behavioral changes were reported to be greatest in the area of increased outdoor activity participation. One possible explanation is that all the students in this course were Human Kinetics students, who were studying physical activity and therefore would be expected to have an interest in outdoor activity participation. Increased outdoor activity participation is also consistent with another portion of the study not reported in detail in this paper on the impact of the course on environmental knowledge. The course had a limited impact on the participants' environmental knowledge but a higher effect on knowledge of personal survival skills and self-knowledge (e.g., reducing stress). While the description of the course stated that the course was to cover "group living, ecology and summer camping skills," the emphasis appeared to be on group living and camping rather than ecology and the environment. These

observations are consistent with several participants' comments about how the course could be changed:

I believe we could have learned more...I don't believe that anybody did a presentation on sort of environmental things, like the way we treat the environment. (Dave)

It's basically survival. (Abby)

Increase the things taught about the environment. Basically, just to see if one person does this and look at the change it can do. And if you know how certain patterns work in the environment, maybe you can work with them instead of against them. (Faye)

It appears that although the environmental content of the course was minimal, the students learned about and adopted increased environmentally friendly behaviors in their everyday lives. While the course seemed to bring about changes in environmental behaviors, it is important to remember that these changes were based on participants' self-reports. Reports of increased pro-environmental behaviors possibly could be the result of providing socially desirable answers.

As a qualitative study, the results cannot be generalized to other outdoor education programs. Additional research is being conducted using the same methodology with participants in this course during the summer of 2008. Plans are also underway to interview students in a similar third-year outdoor education course which is offered during the winter. Although these courses have been offered for several decades, they are being reviewed to determine whether they will continue to be offered. The results of these studies may provide helpful background information in the review of these courses.

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WALK, RIDE AND LEARN: STUDENTS' DISCOVERY OF NATURE AND OTHER ENVIRONMENTAL ELEMENTS ON THEIR ROUTES TO SCHOOL

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Abstract.—America's youth face epidemic levels of childhood obesity and are suffering from a lack of exposure to the outdoors. The Safe Routes to School Program, sponsored by the U.S. Department of Transportation, National Highway Traffic Safety Administration, aims to improve access to safe routes to school for elementary and junior high school children. As a required component of the Safe Routes to School program, researchers use survey instruments and observation tallies to evaluate the effectiveness of the program and assess related local investments in infrastructure and social marketing. The data presented here are from a 2007 and 2008 survey of more than 12,000 Michigan students. The goal of the research is to determine factors that influence transportation behaviors to and from school. Specifically, this research examines students' modes of transportation to school and assesses built structures, natural elements, and social elements along school routes.

1.0 INTRODUCTION AND LITERATURE REVIEW

Parents, teachers, and community planners face many challenges to the health and well-being of our nation's youth. Childhood obesity brought on by a lack of physical activity has become a main topic of concern. One possible way to introduce more physical activity into children's lives is to encourage walking or biking to school. However, opportunities to walk or bike to school diminish when schools are far away from residential communities and when people rely primarily on their vehicles for transportation. The national Safe Routes

to School (SRS) program was created in 2006 to help schools encourage students to walk and bike to school. The program works with primary and middle schools that intend to implement infrastructure changes or social marketing programs to make it safer and more feasible for children to walk or ride their bikes to school.

Louv (2005) raised awareness of an additional challenge in his book *Last Child in the Woods*. He explains that meaningful and extensive outdoor play is lacking in the lives of many young people, who consequently suffer from "nature deficit disorder." Today's children spend far less time outdoors than any past generation. Video games and television keep them indoors, deprived of the experiences and skills they would gain from playing outdoors. Society also places a strong emphasis on academic achievement, and many parents encourage their children to focus on studying after school rather than participating in outdoor activities. Finding inventive ways to incorporate or re-incorporate outdoor physical activity into children's daily routines is an essential first step in reversing these anti-outdoor trends. The Safe Routes to School program encourages parents, teachers, and community planners to make students' routes to school safer as one potential part of the solution.

Researchers have identified many potential benefits from the type of immersion in or exposure to nature that kids may experience while walking or biking to school. Kuo and Taylor (2004) examined the effects of outdoor play on the symptoms of Attention Deficit/Hyperactivity Disorder (ADHD) in children ages 7 to 12 years old. They found that ADHD symptoms were reduced the most when children were exposed to natural settings. Ebbeling et al. (2002) found that regardless of gender and race, children who engaged in less physical activity were more likely to be obese. The Ecological Model of Four Domains of Active Living by Sallis et al. (2006) also emphasizes the important influence of natural features in motivating the adult population to engage in physical activity. This model suggests that features and structures such as parks, trees, and farmlands could be highlighted

or incorporated along school routes to help motivate students to walk or bike to school.

The present research analyzed students' self-reports of what they see on their routes to school and the influence that mode of transportation has on those observations. The observation items were organized a priori into three structural categories: built, natural, and social. The research problem was to determine how mode of transportation influenced observations. Additionally, distance traveled was considered as a possible motivating factor; we expected that students who walked or biked, particularly if they lived less than a mile from school, would report higher levels of social and natural environmental factors. Anecdotal evidence also suggested that kids interact more with others when walking or biking than when riding in a school bus or car.

The purpose of the research is to highlight positive environmental factors and draw attention to negative environmental factors along children's school routes. These findings could inform community planning efforts, school designs, and social programs that would encourage students to walk or bike to school.

2.0 METHODS

Schools in the Safe Routes to School Program are required to participate in evaluations of the program's effectiveness in their communities. The population for this analysis was 245 schools with a total enrollment of 97,960 that registered for the SRS program in 2007 and 2008. The sample consisted of 12,722 students from 54 schools that registered in the program and participated in the evaluation part of the program. The sample included urban (44%), suburban (28%), and rural (28%) schools. The students were from primary and middle school grades; the greatest percentage of respondents were 4th graders (18%) and 3rd graders (17%), as shown in Table 1.

Data were collected using a two-page paper survey written in a kid-friendly format. Teachers and parent volunteers administered the surveys in a classroom setting. Schools ordered paper surveys from Michigan State University and returned completed surveys to

Table 1.—Distribution of respondents' grade levels

Grade (n = 12,722)	Percentage of Respondents
Kindergarten	1%
1st Grade	3%
2nd Grade	6%
3rd Grade	17%
4th Grade	18%
5th Grade	16%
6th Grade	13%
7th Grade	14%
8th Grade	11%
Total	100%

the University for keying and analysis. Schools were encouraged to complete these surveys in the fall and spring, when the weather was amenable to being outdoors. The week that students completed the surveys, survey administrators also conducted a classroom tally of morning and afternoon modes of transportation. Parents were asked to complete a separate survey as well.

The research presented here focused on three pieces of data: students' modes of transportation to school on the morning that the survey was administered (actual behavior); which of 15 physical features students reported seeing on their way to school that day; and distance (in miles) from their home to school. The mode of transportation question was dummy-coded so that walkers, bikers, bus takers, and car riders could be analyzed as separate segments. The observation items and distance questions were also nominal data. The observation items were put into three categories: "Built," "Natural," and "Social." Built structures comprised houses where people live, abandoned houses, apartment buildings, stores, gas stations, factories, parking areas, empty lots, and construction areas. Natural structures were parks, trees, and farmland. Social structures consisted of neighbors, strangers, and crime.

Descriptive and nonparametric statistics were used to examine the relationship between modes of transportation and students' reported observations of what they passed on the way to school. Statistical analysis was conducted on the entire sample, as well as on a subsample of students who live less than a mile from

school. Because of the large sample size, a phi coefficient was used as a measure of association (Sirkin 1995) with nonparametric data. Using the phi coefficient, values less than 0.2 indicate a negligible relationship, values from 0.2 up to 0.5 indicate an important relationship, and values between 0.5 and 1.0 indicate a very strong relationship.

3.0 FINDINGS

Thirty-nine percent of students rode to school in their parents' cars on the morning of the survey (Table 2). Riding the bus (36%) and walking (13%) were the next most-common modes of transportation. Only 1 percent of all respondents had ridden their bikes to school, but data from bikers receive special attention in this analysis because of the potential health benefits of biking to school versus riding in a motor vehicle. Other possible modes of transportation were riding with siblings, riding in someone else's car, riding the city bus, rollerblading, or skateboarding; these options combined represented 11 percent of the sample. Slightly less than one-third (31%) of the students lived within a mile of school, 36 percent lived more than a mile away, and the remaining 33 percent checked "don't know." Further analysis showed that the majority (67%) of students who walked to school lived within a mile of the school, as did the majority of students who biked (Table 3). Students who lived more than a mile from school were more than twice as likely to ride a school bus to school than those who lived less than a mile away (Table 3).

The first round of analysis included all the students in the sample. More than 90 percent reported seeing built elements, and more than 80 percent reported seeing natural elements on their way to school across four modes of transportation (i.e., walking, biking, riding the bus, riding in a parent's car) (Table 4). Seven out of ten children reported seeing social elements, regardless of transportation mode. There were no significant relationships between built structure observations and transportation mode. More than half of the students in all transportation modes saw parking lots, which are considered an unsafe element on school routes because of high traffic levels (Table 5). More than half of the bus riders and students who rode to school in their parents'

Table 2.—Distribution of mode of morning transportation

Mode of Morning Transportation (n = 12,722)	Percentage of Respondents
Walk	13%
Bike	1%
Ride School Bus	36%
Ride in Parent's Car	39%
Other (includes: City Bus, With Siblings, Other Person's Car, Rollerblading, Skateboarding)	11%
Total	100%

Table 3.—Mode of morning transportation by distance traveled

Mode of Morning Transportation (n = 12,722)	Up to a Mile*	Greater than a Mile*
Walk	67%	10%
Bike	65%	16%
Bus	18%	49%
Parent's Car	32%	36%

*Students were also allowed to select "Don't Know" when asked how far they lived from school. This response accounts for the remaining percentages in each transportation category.

cars observed gas stations, as did one-third of walkers and bikers. Gas stations could also be dangerous to walkers and bikers due to high traffic flow and cars entering and leaving the roadway across walking paths. Empty houses also have a potentially negative impact on students' safety; more than one-third of all students across the four modes of transportation reported seeing empty houses on their way to school.

Of the three natural elements in the list, trees were most commonly reported (Table 6). Significantly more walkers versus nonwalkers ($\phi = .16$) and more bus riders versus non-bus riders ($\phi = .20$) reported seeing farmlands.

Observations of social elements did not differ significantly across the four modes of transportation. More walkers than students using other modes of transportation saw neighbors (considered a positive social element) (Table 7). Bikers and walkers saw more crime than students who took the bus or rode with their parents to school.

Table 4.—Observation of built structures, natural elements, and social elements by all respondents

	Walkers	Nonwalkers	Bikers	Nonbikers	Bus Riders	Non-Bus Riders	Parent's Car	Non-Parent's Car
Natural	82%	87%	88%	87%	90%	85%	86%	87%
Social	77%	77%	74%	77%	79%	76%	76%	78%
Built	91%	93%	92%	93%	95%	92%	93%	93%

Table 5.—Observation of built elements by all respondents

Built Elements	Walkers	Nonwalkers	Bikers	Nonbikers	Bus Riders	Non-Bus Riders	Parent's Car	NonParent's Car
Houses Where People Live	83%	88%	83%	87%	90%	85%	87%	87%
Empty Houses	41%	40%	37%	40%	39%	41%	40%	40%
Apartments	27%	38%	30%	36%	41%	33%	36%	37%
Stores	45%	62%	41%	60%	65%	57%	61%	59%
Gas Stations	32%	57%	33%	54%	60%	51%	56%	53%
Factories	8%	12%	9%	11%	11%	11%	12%	10%
Parking Areas	51%	61%	52%	59%	63%	57%	59%	59%
Empty Lots	30%	34%	28%	34%	35%	33%	34%	34%
Construction Areas	17%	28%	20%	26%	29%	24%	27%	26%

Table 6.—Observation of natural elements by all respondents

Natural Elements	Walkers	Nonwalkers	Bikers	Nonbikers	Bus Riders	Non-Bus Riders	Parent's Car	Non-Parent's Car
Parks	34%	36%	42%	35%	37%	34%	35%	35%
Trees	79%	35%	83%	84%	87%	82%	83%	85%
Farmlands	4%	21%	11%	19%	29%	13%	16%	21%

Table 7.—Observation of social elements by all respondents

Social Elements	Walkers	Nonwalkers	Bikers	Nonbikers	Bus Riders	Non-Bus Riders	Parent's Car	Non-Parent's Car
Neighbors	64%	61%	59%	61%	63%	60%	59%	62%
Strangers	55%	62%	60%	61%	64%	59%	60%	61%
Crime	13%	9%	18%	9%	7%	11%	10%	9%

Next, we analyzed data from a subsample of students who lived less than a mile from school to determine whether their observations and experiences differed from those of the entire sample. Students living less than a mile from school were slightly more likely to report seeing built structures on their way to school (Table 8; compare with Table 4). More than 85 percent reported seeing “Houses where people live,” and more than one-third reported seeing empty houses (Table 9).

For natural elements, there was a significant relationship between observations of farmland among walkers versus nonwalkers ($\phi = .15$) and among bus riders versus non-bus riders ($\phi = .22$) (Table 10). A significant relationship also was found between bus riding and observations of farmland. Students who walked and rode the bus observed more farmland than those who did not walk or ride the bus.

Table 8.—Observation of built structures, natural elements and social elements by respondents living ≤1 mile from school

	Walkers	Nonwalkers	Bikers	Nonbikers	Bus Riders	Non-Bus Riders	Parent's Car	Non-Parent's Car
Natural	84%	86%	87%	85%	87%	85%	85%	86%
Social	79%	78%	82%	78%	79%	78%	76%	79%
Built	92%	93%	93%	93%	94%	92%	93%	93%

Table 9.—Observation of built elements by respondents living ≤1 mile from school

Built Elements	Walkers	Nonwalkers	Bikers	Nonbikers	Bus Riders	Non-Bus Riders	Parent's Car	Non-Parent's Car
Houses Where People Live	85%	87%	90%	87%	90%	85%	87%	87%
Empty Houses	40%	40%	34%	40%	38%	40%	39%	40%
Apartments	26%	33%	29%	31%	38%	30%	32%	31%
Stores	43%	53%	30%	50%	57%	48%	51%	49%
Gas Stations	28%	45%	22%	41%	48%	38%	45%	37%
Factories	7%	9%	5%	9%	10%	8%	8%	8%
Parking Areas	52%	57%	51%	56%	63%	55%	55%	55%
Empty Lots	29%	31%	22%	31%	31%	30%	31%	30%
Construction Areas	15%	15%	12%	20%	24%	19%	21%	19%

Table 10.—Observation of natural elements by respondents living ≤ 1 mile from school

Natural Elements	Walkers	Nonwalkers	Bikers	Nonbikers	Bus Riders	Non-Bus Riders	Parent's Car	Non-Parent's Car
Parks	30%	32%	34%	31%	31%	31%	31%	32%
Trees	82%	84%	84%	83%	86%	82%	82%	84%
Farmlands	3%	13%	11%	10%	23%	7%	9%	11%

Table 11.—Observation of social elements by respondents living ≤ 1 mile from school

Social Elements	Walkers	Nonwalkers	Bikers	Nonbikers	Bus Riders	Non-Bus Riders	Parent's Car	Non-Parent's Car
Neighbors	68%	64%	63%	65%	66%	65%	63%	67%
Strangers	55%	59%	65%	58%	61%	57%	57%	59%
Crime	12%	10%	16%	10%	7%	11%	10%	10%

There were no significant relationships between different modes of transportation and the social category of observations. Approximately 6 out of 10 students observed neighbors on their route to school across all

four modes of transportation (Table 11). More walkers (12%) and bikers (16%) observed crime than did students using any other mode of transportation.

4.0 DISCUSSION AND CONCLUSION

Primary and middle school students reported that they saw both positive and negative things on their way to school. Built elements were more prevalent than social or natural elements. While most students reported seeing trees, houses, and neighbors, an alarming number also saw strangers, crime, gas stations, parking lots, and empty houses. Surprisingly, walkers did not report higher levels of parks, trees, and farmlands along their routes than did nonwalkers. On a social thread, more walkers than nonwalkers reported seeing neighbors.

In this analysis, distance did not appear to moderate the relationship between environmental observations and transportation modes. Students who lived close to school had similar patterns of observations as their peers. More advanced statistical analysis of the data may uncover more nuanced findings.

If community planners, educators, and parents work together to develop safe routes to school, students may experience and observe more of the natural and social elements of their environment. This opportunity for observation could lead to a greater awareness of nature and may begin to help combat “nature deficit disorder.” This study shows that less than half of the students who walk or bike to school observe natural elements such as parks en route (Table 6). Creating safe routes to school that connect with parks would enable students to observe more natural elements on the way to school.

This study also showed that negative social structures such as strangers and crime (Table 7) and negative built structures such as empty houses, gas stations, and parking areas (Table 5) are prevalent on the school routes of Michigan students who walk or bike to school. These findings should be validated with walking audits

of the neighborhoods surrounding schools; audits are another element of the larger Safe Routes program. By eliminating negative environmental elements on students’ routes to school, parents, students, and school administrators may have an easier job promoting walking or biking to school.

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6.0 CITATIONS

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“I’M TOO OLD TO GO OUTSIDE!” EXAMINING AGE-RELATED DIFFERENCES IN CHILDREN’S ENVIRONMENTAL ORIENTATIONS

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Abstract.—Studies of the recent decline in nature-based recreation participation have identified the growing disconnect between children and the natural world as a persistent problem. Limited childhood exposure to nature may influence preferences and propensities to engage in future environmental behavior, but studies have not indicated when and how these effects are manifested during the maturation process. This study addressed these questions with surveys and interviews designed to assess age-related shifts in three important components of children’s environmental orientations: eco-affinity, eco-awareness, and environmental knowledge. Data were collected from 407 6- to 13-year-olds across northern Georgia and analyzed using nonparametric procedures. Children of all ages displayed relatively high levels of eco-awareness and environmental knowledge. However, Kruskal-Wallis tests revealed a significant decline in eco-affinity and environmental knowledge scores among children in older age groups. Future environmental education programs may benefit from an increased emphasis on building and maintaining eco-affinity in 10- to 13-year-old children.

1.0 INTRODUCTION

The growing disconnect between children and nature is a major concern with profound implications for the environmental, social, and physical well-being of children (Kahn and Kellert 2002, Louv 2005). An absence of authentic outdoor experiences (i.e., “nature deprivation”) may help to explain recent reports of declining health, diminishing environmental literacy, and waning interest in nature-based recreation among younger populations

(Coyle 2005, Kellert 2005, Pergams and Zaradic 2006). Environmental education (EE) has been hailed as one potential solution to nature deprivation. Legislative initiatives such as the No Child Left Inside Act are also gaining momentum, and implementation of EE programs and curricula is expected to increase.

With limited resources and budget constraints, critical decisions regarding when and how EE programs will be most effective are imminent. In this context, defining the ideal target age group for EE delivery has been a subject of substantial debate. An overall increase in environmental concern and emotional attachment to nature has been observed in middle childhood (Eagles and Demare 1999, Kahn 1999, Kahn and Kellert 2002). Other studies have found evidence that specific indicators of environmental attitudes and behavioral intentions are typically higher for younger individuals (Hines et al. 1986, Leeming et al. 1995). Although researchers concur that the development of environmental attitudes and awareness may help children build environmental stewardship values from an early age (Evans et al. 2007), few can agree on the ideal target age group.

As part of a larger effort to evaluate EE program impacts on environmental attitudes and awareness, this research used a mixed-methods approach to focus on age-related differences in environmental orientations. The purpose of this study was to compare the environmental orientations of children from different age groups and to detect critical points in childhood development where age-related differences in environmental attitudes were most evident. Identifying optimal age ranges for EE interventions could affect the design, scope, and implementation of future EE programs.

2.0 METHODS

This study involved 407 children participating in EE summer camps, after-school science clubs, and general after-school programs in Athens-Clarke County, Georgia. All data were collected prior to the EE instruction. Data for children in the summer camps were collected from 18

Table 1.—Pooled age distribution and within-group reliability estimates by age groups.

Age group	Participants	Cronbach's alpha ^a
7 & younger	17	0.814
8	68	0.737
9	74	0.767
10	158	0.864
11	67	0.876
12 & older	23	0.943
TOTAL	407	0.841

^aAlpha for complete 15-item Children's Environmental Perceptions Scale

June to 10 August 2007. Data for children in the science clubs and general after-school programs were collected throughout the 2007-08 academic year. Ages ranged from 6 to 13, but most participants were between 8 and 11 (See Table 1; mean age = 9.7 ± 1.3). Participant age structure was similar across the summer camp, science club, and general after-school groups. Children were placed in six age group categories (7 and younger, 8, 9, 10, 11, 12 and older) to adjust for unequal sample sizes and developmental differences. Qualitative interview data were collected from a subsample of 68 children (mean age = 9.4 ± 1.4) in the EE summer camps.

The children's environmental orientations were measured using the revised Children's Environmental Perceptions Scale (CEPS), a 15-item survey with Likert-type responses designed to gauge levels of eco-affinity and eco-awareness (Larson et al. submitted). Additional multiple-choice questions (four for summer camp surveys and eight for science club and after-school program surveys) were used to assess knowledge of specific environmental concepts. Average scores on the environmental knowledge subscale were calculated to allow for inter-group comparisons. The complete survey instrument was intentionally limited to 23 or fewer items to minimize the time burden for younger survey participants. Researchers administered summer camp surveys in small groups (4 to 10 individuals) and read them aloud to improve comprehension and increase the accuracy of responses. Trained teachers read aloud science club and after-school surveys to groups no larger than 30 students. Approximately 10 minutes was needed to complete CEPS.

Researchers and trained volunteers conducted personal interviews, which were semi-structured to provide a more detailed look at an individual's interaction with nature. Questions encouraged children to describe their leisure-time activities, outdoor experiences, and opinions of nature. Interviews ranged from 2 to 10 minutes, with an average duration of about 6 minutes.

The reliability and validity of the survey instrument was assessed with SPSS 17.0 (SPSS, Inc., Chicago, IL). Reliability estimates of internal consistency were measured for the overall population and subgroups using Cronbach's alpha. An exploratory factor analysis with oblique rotation was used to identify constructs embedded in the 15-item CEPS. Eco-affinity, eco-awareness, and environmental knowledge scores were compared using nonparametric procedures, including Kruskal-Wallis tests and Mann-Whitney *U* tests because of deviations from normal data distribution. Follow-up tests were conducted using Mann-Whitney *U* tests with Holm's sequential Bonferroni corrections to evaluate pairwise differences among the age categories. Incomplete surveys were omitted from the analysis. Qualitative data were assessed using an inductive analysis and constant comparative method to identify emerging patterns and classify interview responses into a set of ordered categories to supplement quantitative data (Dey 1993).

3.0 RESULTS

Overall reliability coefficients for the revised 15-item CEPS (Cronbach's alpha = 0.841) and the eco-affinity (alpha = 0.860) and eco-awareness (alpha = 0.700) subscales were high. Internal consistency remained high within the data when reliability coefficients were stratified by age group (See Table 1). The factor analysis supported a two-factor structure that was consistent with previous results (Larson et al. submitted).

Kruskal-Wallis tests comparing survey scores across age groups revealed significant differences in eco-affinity ($\chi^2_{5,N=359} = 37.8$, $p \leq 0.001$, $\eta^2 = 0.11$) and environmental knowledge ($\chi^2_{5,N=368} = 21.3$, $p = 0.001$, $\eta^2 = 0.06$). Differences in eco-awareness scores among age groups were not evident ($\chi^2_{5,N=363} = 4.2$, $p = 0.527$, $\eta^2 = 0.01$). In general, eco-affinity decreased as

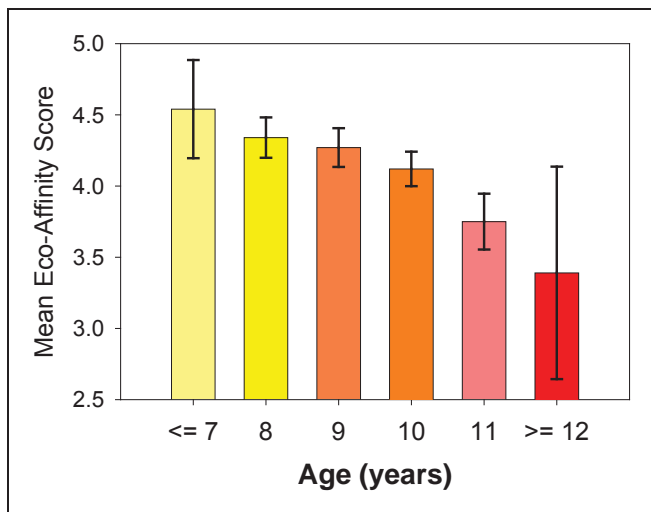


Figure 1.—Mean eco-affinity scores by age group (\pm 95% CI).

children got older (see Fig. 1). Scores for 8-, 9-, and 10-year-olds were significantly higher than scores of children 11 and older. Pairwise comparisons showed a peak in environmental knowledge at age 10 (see Fig. 2). Environmental knowledge was significantly lower in 11-year-olds and appeared to continue on a downward trajectory for children 12 and older. The large variability associated with mean scores for children 12 and older was likely due to the small sample size. Children in the after-school science clubs displayed higher eco-affinity, eco-awareness, and environmental knowledge scores than children in the EE summer camps or general after-school programs.

Qualitative results indicated that 81 percent of children interviewed preferred outdoor or indoor/outdoor activities to those that occurred exclusively inside. The overwhelming preference for outdoor activities was consistent across age groups. Most children of all ages (85 percent) also claimed they enjoyed being outside. According to one 11-year-old girl, “Outside is just better than being inside. Inside, there’s nothing to do.” Distinct age-related outdoor activity patterns began to emerge in the inductive analysis of interview responses. In general, younger children (≤ 10 years old) reported spending more time outside in their own backyards than older children. Older children tended to engage in more social outdoor activities than younger children and described less direct interaction with nature than their younger counterparts.

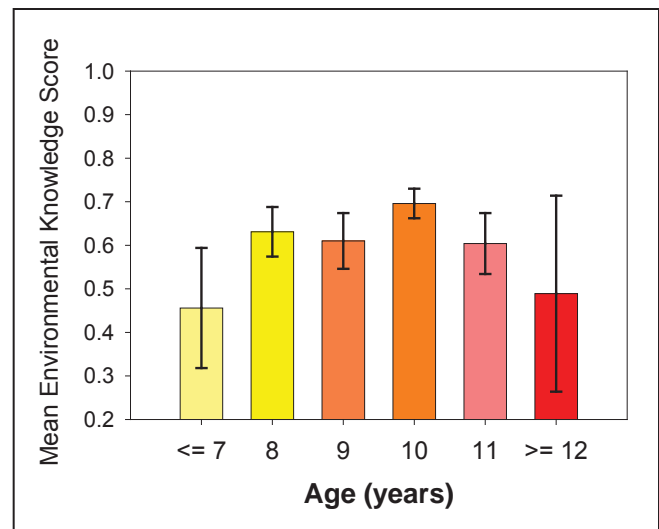


Figure 2.—Mean environmental knowledge scores by age group (\pm 95% CI).

4.0 DISCUSSION AND IMPLICATIONS

This study attempted to build on child development theory to provide an empirical framework for evaluating age-related differences in environmental orientations. Results revealed significant declines in eco-affinity and environmental knowledge for children between the ages of 10 and 11. The CEPS data suggest that EE efforts could focus on maintaining positive eco-affinity and environmental knowledge in 10-year-old children before they progress into the teenage years. A decreased emphasis on formal outdoor science activities once children make the transition from elementary to middle schools typically around age 11 may be related to their diminishing preference for nature (Coyle 2005). Environmental education initiatives exclusively focused on building awareness may fail to stimulate interest in nature, which is a more direct measure of a child’s ability to nurture a continued connection with the natural environment.

Although most children expressed a general passion for the outdoors, children from different age groups appeared to experience nature in distinct ways. When children 11 and older described their outdoor experiences, many of their stories involved friends or social activities. Interviews with younger children (≤ 10 years old) included more references to independent exploration and direct contact with nature. This study supports Vadala et al.’s (2007) argument that interaction

with nature and interaction *within* nature represent two very different behaviors with distinct outcomes. For children approaching adolescence, outdoor experiences may be valued more as social development and peer networking opportunities than as a medium for direct contact with native ecosystems (Burton et al. 1996). Future EE programs could adapt to the shifting priorities of older children and present material in a manner that promotes eco-affinity and environmental knowledge through interaction within nature.

This research provides a useful baseline, but additional research that expands the sample frame and research design is needed to identify specific mechanisms that explain age-related changes in environmental orientations. The current investigation relied primarily on data from self-selected participants of nature-based camps and after-school clubs, and these children may not accurately represent the environmental orientations of the average child in the general population. For example, many children in the sample displayed high eco-affinity scores that reflected a strong pre-existing interest in nature. Consequently, differences in children's environmental orientations among age groups in the general population may be even more pronounced. Future research should also control for other demographic variables (e.g., ethnicity, gender). Ethnic differences in eco-awareness and environmental knowledge, for instance, have been observed in previous studies (Bullard 1993, Larson et al. 2008); therefore, an ethnically biased sample may confound interpretation. Finally, a longitudinal study that controls for individual differences by tracing the development of a child's attitudes over time would allow for more meaningful comparisons and more powerful analyses of age-mediated shifts in children's views of nature. With these improvements, researchers will be better equipped to examine the significance of the age 10-to-11 transition as an optimal intervention point in the struggle to combat nature-deficit disorder.

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*URBAN RECREATION
CHALLENGES*

FISH CONSUMPTION RISK PERCEPTION AMONG ANGLERS IN AN INDUSTRIAL URBAN AREA

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Abstract.—Over two summers, we conducted field interviews with anglers in the industrial Calumet Region of northwest Indiana and southeast Chicago. The data collected provide insight into how anglers assess the risks of eating the fish they catch. Some anglers practiced catch and release because of concerns about water pollution while others just did not eat fish. Those who ate fish they caught expressed a range of beliefs (some accurate, some not) about detecting pollution, choosing “safe” fishing spots, and removing pollution from fish. There was widespread uncertainty about how people can know what is safe or unsafe to eat (both fish and other foods). Almost no one had read official state-issued fishing guidebooks yet some were familiar with information available in the guidebooks. In light of these findings, we consider the many challenges of conveying accurate fish consumption risk information to a diverse urban fishing population.

1.0 PURPOSE OF THE RESEARCH

This research grew out of concerns raised by environmental organizations and park and natural resource managers in the industrial Calumet region of southeast Chicago, the south Chicago suburbs, and northeast Indiana. Observers saw people fishing almost everywhere in the region during good weather but little was known about who the anglers were, what they were catching, and whether they were eating caught fish. Resource managers were also unsure about how to reach out to local anglers, especially those fishing on private property or at locations that were not officially sanctioned for fishing. This project was designed to collect basic

information from Calumet anglers about whether they were eating their catch and what they thought about the potential health risks of eating fish from Calumet waters.

1.1 Environmental History of the Calumet Region

[T]here was a grove of trees just south of the [Altgeld Gardens public housing] project, and running south and west of that was the Calumet River, where you could sometimes see men flick fishing lines lazily into darkening waters. But the fish that swam those waters were often strangely discolored, with cataract eyes and lumps in their gills. People ate their catch only if they had to.

– Barack Obama, *Dreams from my Father: A Story of Race and Inheritance*, p. 164

The history of the Calumet Region is the story of the Industrial Revolution in America. Starting in the 1850s, giant steel manufacturing facilities were built across the region along with grain elevators, shipyards, and other industries over the decades. Many of these facilities were enormous—factory complexes covering hundreds of acres, shipyards and port facilities stretching for miles along lakes and rivers, and, later, landfills (both regulated and unregulated) the size of 20 city blocks. Generations of immigrant workers and Calumet’s extensive transportation infrastructure of waterways, railroad lines, and roads made this development possible.

For most of Calumet’s industrial history, smoke churning out of factory stacks meant jobs and prosperity for local people. Industrial waste products such as chemical sludge, steel slag, and construction debris were dumped in the nearest convenient place, often wetlands or unused land. The environmental laws of the 1970s and 1980s eventually decreased active pollution of Calumet’s air, water, and soil. In the 1980s, the dramatic decline of the steel industry shuttered factories all over Calumet; this continued to reduce the sources of pollution but was devastating to the local economy.



Figure 1.—Aerial view of the Calumet River, looking north to Lake Michigan, January 1975. Photo used with permission of the Southeast Historical Society.

Today, Calumet has diverse communities that were strongly shaped by the region's industrial heritage and waves of immigration. The U.S. Census data in Table 1 help tell the story of the region's racial, ethnic, and income diversity. Whole neighborhoods that grew up around giant steel mills have begun to try to reinvent themselves but the local economy has struggled in the wake of the manufacturing decline as the high (but varying) unemployment and poverty statistics suggest.

Despite its industrial history, Calumet has a patchwork of remnant wetlands and natural areas, some with excellent habitat quality, that continue to support native species of plants, birds, insects, land animals, and fish. At a BioBlitz event in 2002, hundreds of volunteer scientists and residents conducting a species inventory found more than 2200 species in the natural areas around Lake Calumet in 24 hours (The Field Museum 2007). Calumet's wetland patches provide important bird stopover and breeding habitat along the Midwest's migratory bird flyways.

Many residents, agencies, and organizations recognize Calumet's ecological importance and value its remaining

natural areas. The Calumet Initiative, for example, is a coalition of educational, government, nonprofit, cultural, business, and philanthropic organizations that has been working for almost 10 years on projects and partnerships to revitalize the region's economy and environment. The Marquette Plan has also provided a large-scale vision for connecting, attracting investment to, and providing public access to the beaches and natural areas along the south shore of Lake Michigan.

For local anglers, there are compelling reasons to fish in Calumet waterways. There is a diversity of fish species and many now-abandoned industrial sites are relatively quiet and isolated, providing peaceful getaway spots within the city. Many Calumet anglers have a personal or family history of fishing in the region.

1.1 The Waterways of the Calumet Region and Fish Consumption Advisories

The Calumet Region is an unofficially defined area that stretches roughly from the south Chicago neighborhoods of East Side, South Deering, Hegewisch, and Pullman along the southern shore of Lake Michigan into Indiana

Table 1.—Comparative statistics for selected Calumet communities from 2000 U.S. Census

City or Neighborhood	Total Population	% Black	% Non-Hispanic White	% Hispanic or Latino	Median household income	% Individuals below poverty line	% Unemployed ^c
Chicago neighborhood of East Side ^a	23,653	1.8	29.4	68.1	\$39,184	12.4	12.5
Chicago neighborhood of Hegewisch ^a	9,781	1.6	67.0	28.8	\$43,903	10.6	7.9
Chicago neighborhood of Pullman ^a	8,921	82.5	8.5	8.9	\$32,111	22.4	17.2
Chicago neighborhood of South Chicago ^a	38,596	70.3	2.9	27.4	\$28,785	29.7	18.2
Chicago neighborhood of South Deering ^a	16,990	62.0	7.6	30.5	\$35,684	19.6	11.9
City of Calumet City, Illinois ^b	39,071	53.9	34.4	10.9	\$38,902	12.2	8.0
City of East Chicago, Indiana ^b	32,414	36.8	12.1	51.6	\$26,538	24.4	15.4
City of Gary, Indiana ^b	102,746	85.3	10.1	4.9	\$27,195	25.8	14.9
City of Hammond, Indiana ^b	83,048	15.3	62.4	21.0	\$35,528	14.3	8.9

^a Census data by Chicago neighborhood is from the Metropolitan Chicago Information Center.

^b City data is from the U.S. Census website.

^c For comparison, in 2000 the Chicago-wide unemployment rate was 10.1%, the Lake County, Indiana, unemployment rate was 7.5%, and the national unemployment rate was 5.8% (data from U.S. Census website).

including the cities of Gary, Hammond, Whiting, and East Chicago (see Fig. 2). The major waterways in the region are Lake Michigan, the Calumet River, the Little Calumet River, the Grand Calumet River, the Indiana Harbor Canal, and Lake Calumet. Other waterways like Wolf Lake on the Illinois/Indiana border and smaller lakes like Powderhorn, Flatfoot, Lake George, and Lake Etta are not barge-navigable but are open for recreational activities including boating and fishing. The region also has dozens of smaller wetland areas, many of which are used for fishing.

All of Calumet's major waterways are alongside or within sight of active or abandoned industrial facilities and most, if not all, have been manipulated and changed over time by human activity. For navigable waterways, this has included filling along shorelines, hardening banks, cutting shipping slips, and dredging channels to allow barge traffic. Wetlands have been filled and shaped using construction debris, steel slag, and/or dredge spoils from other waterways.

Today, Calumet's waterbodies have varying water and sediment quality. At the time of this research, it was difficult for the average person to get definitive

and up-to-date water quality information for local waterways. The states of Illinois and Indiana offer official guidebooks that provide some fish consumption advice for anglers based on water and sediment quality data; the guidebooks are available online and in hard copy where fishing licenses are sold. At the time of the research fieldwork, Illinois had a statewide mercury advisory for all waters and the Calumet area in Illinois had a polychlorinated biphenyl (PCB) advisory for carp, channel catfish, sunfish, and several bass species (Illinois Department of Natural Resources 2002). The Indiana guidebook provided only a general overview of consumption advisories and several fish cleaning techniques for mitigating consumption risks but the guidebook directed people to the Internet for detailed information about consumption advisories (Indiana Department of Natural Resources 2002). Anglers who took the time to go online for this information would have found that the Indiana State Department of Health advised limiting consumption of a long list of fish species from Calumet waterways because of PCBs. There were also very strict "Do Not Eat" advisories for all carp and catfish plus large fish of nine other species from Lake Michigan tributary waters and for all fish from the Grand Calumet River and the Indiana Harbor Canal in Indiana.



Figure 2.—Aerial photo of the Calumet Region from Google Earth.

2.0 LITERATURE REVIEW

In the past 20 years or so, a range of research has focused on the consumption of sport-caught fish in different areas of the United States. A subset has looked at how anglers think about the risks of eating sport-caught fish (Beehler et al. 2001, Burger et al. 1999, Burger 1997, Burger et al. 1998, Burger et al. 1993, Knuth et al. 2003, May and Burger 1996, Pflugh et al. 1999). To summarize, this research has found that anglers expect to be able to detect pollution in water and fish and therefore underestimate the presence of contaminants that cannot be detected with the human senses. There are also disparities among people (e.g., of different races or ethnicities, different education levels, and different income levels) when it comes to assessing fish consumption risks and applying perceived risks to behavioral choices.

Previous research has also looked at fish consumption advisory awareness among anglers who are fishing in contaminated waters (Anderson et al. 2004, Beehler et al. 2001, Beehler et al. 2003, Bienenfeld et al. 2003, Burger 1998, Burger 2004, Burger and Waishwell 2001, Campbell et al. 2002, Imm et al. 2005, Sheaffer and

O'Leary 2005, Tilden et al. 1997). All have found that relatively few anglers (usually less than 50 percent) have read formal advisories and that knowledge of details from advisories is highly variable among anglers. In addition, all of these studies have found that many people who know about advisories still eat sport-caught fish from contaminated waters if they are inclined to do so.

The Sheaffer and O'Leary (2005) study looked specifically at fish consumption patterns among Indiana anglers. The authors carefully calculated a safe consumption threshold of about 30 grams of fish per day based on health data and Indiana water contamination data. They found that 16 percent of anglers ate more than 30 grams per day and non-White anglers were significantly more likely than White anglers to be eating more than the threshold amount.

3.0 METHODS

Over two summers (2002 and 2003), we conducted field interviews with Calumet anglers. An ethnographer (co-author Longoni) from the Field Museum brought fishing gear to a range of Calumet fishing spots, actually

did some fishing himself at each site, made notes about the number of anglers and their fishing practices, and interviewed a selection of anglers. The ethnographer participated in fishing himself in order to put other anglers at ease since many of the fishing sites were not officially sanctioned. When requesting an interview, the ethnographer always made clear that he worked for the Field Museum and was conducting a research study. Interviews were semi-structured around three main topics of interest: 1) fish consumption patterns; 2) knowledge and perception of fish consumption risks; and 3) anglers' strategies for minimizing fish consumption risks. Interviewees were allowed to guide the course of each conversation and to bring up any topic that they considered related to fish consumption.

This was a qualitative research project designed to collect a wealth of information about how Calumet anglers think about the risks of eating locally caught fish. As such, the results are meant to be informative but do not include extensive statistical analysis. The dataset was the ethnographer's extensive during- and after-interview notes. Some interviews were recorded and recordings were used to supplement interview notes. All participants were promised confidentiality and anonymity. A total of 170 people participated including 127 anglers and people with them at fishing sites (for example, friends or spouses who were not fishing).

At each fishing site, the ethnographer noted how many people were fishing and requested interviews from representative numbers of Blacks, Whites, and Hispanics, whenever possible. Supplemental interviews were conducted with people like bait shop owners, local fish fry attendees, and conservation officers. The data were uploaded to Atlas.ti and NVivo 7 qualitative software for two comprehensive rounds of theme coding and analysis by the authors. See Westphal et al. (2008) for a full description of the data collection and analysis procedures.

4.0 RESULTS

4.1 Interviewees' Fish Consumption

Ninety-seven interviewees provided definitive information about their sport fish consumption habits. About two-thirds reported eating Calumet fish at least

once that summer and about 45 percent ate their catch whenever they went fishing. Many anglers also gave caught fish away to others to eat. There were distinct differences in fish consumption patterns between Blacks, Whites, and Hispanics. Blacks were the most likely to have eaten fish from Calumet waters (about 93 percent had) and 68 percent reported regularly fishing specifically for fish to eat. About 78 percent of Hispanics and 57 percent of Whites had eaten Calumet fish; about 50 percent of Hispanics but only 20 percent of Whites said they regularly fished for fish to eat. Because of the qualitative nature of the data collection, these statistics are not necessarily generalizable to the larger Calumet angler population.

4.2 Interviewees' Perceptions of Fish Consumption Risks

Each of the topics introduced below was brought up and discussed by at least 20 interviewees. A more comprehensive presentation of the research results is available in Westphal et al. (2008).

When asked to talk about whether or not it was safe to eat the fish they caught, the anglers expressed a wide range of attitudes and opinions. Some longtime residents had been eating locally caught fish all their lives without noticeable health impacts while others scoffed at the idea of eating the fish they caught in Calumet. Most who did eat the fish trusted what they had been told by friends, family, and other anglers about where the water and the fish were "clean" and where they weren't—even if they had gotten this information many years before.

Almost no one had read the official state-issued fishing guidebooks but many had gleaned information available in the guidebooks from other sources like the media or other anglers. For example, some anglers removed the belly fat of fish before cooking in order to remove contaminants; many health organizations recommend this to remove PCBs and other fat-concentrated toxins but it may not affect mercury and other contaminants that collect in fish muscles or organs. Anglers rarely offered or understood this level of detail about contaminant threats. Some stated that they avoided "bottom-feeders" like carp and catfish for a variety of reasons (e.g., they disliked the taste of those species or were put off by detritus- or garbage-eating fish). This

turns out to correspond with advisory warnings since bottom-feeders like carp and catfish are more likely than upper water column fish to be contaminated with PCBs. On the other hand, some anglers specifically sought out carp or catfish to catch, keep, and eat.

Many interviewees expressed common-sensical, if sometimes inaccurate, beliefs about how careful site selection could ensure safe-to-eat fish. Anglers who were new to the area figured it was safe to fish where others were fishing. Some believed that certain waterbodies were “spring-fed” (according to local legend or reputation) and that these were automatically cleaner and safer. Study sites included “pay lakes” where the fish were stocked from outside sources and fed by hand. Anglers paid a daily fee to fish at pay lakes and they believed that the fish there were safe to eat since they had been raised somewhere else and fed presumably uncontaminated food. This seems reasonable but we did not have data to prove or disprove it.

Most anglers and others believed that they would be able to tell if water was polluted by using their senses, their own common sense, and/or their experience as anglers and residents of the area. They thought that contaminated water would look funny, have a rainbow sheen on the surface, smell bad, or be cloudy, stagnant, or discolored. Some thought that visible nearby industry (active or inactive) and debris such as dumped garbage near the water automatically signaled pollution. Certain local waterbodies or portions of waterbodies were routinely avoided for consumption-oriented fishing because they had a local reputation (usually rightfully so) for being polluted.

When asked how they would tell if a fish was contaminated, many anglers said they did not know or said they would look for discolored flesh, disease, or deformities. Many interviewees stated that “fresh” fish was safe to eat; they believed the health threat from fish consumption was largely bacterial food poisoning. They also generally believed that eating seemingly healthy fish was completely safe or that eating contaminated fish would result in immediate sickness (within 24 hours). The interviewees almost never mentioned and seemed largely unaware of or unconcerned about the possible long-term health effects of slowly bioaccumulating toxins in the human body.

5.0 DISCUSSION AND LESSONS LEARNED

This research clearly demonstrated that almost all participants had given some thought to pollution issues related to both fishing and life in general in Calumet. Both fish eaters and non-eaters offered reasonable explanations about how pollution might or might not affect them, based on their experiences, beliefs and level of knowledge and awareness of scientific and health information. Once the interviewer initiated conversations, most people were eager to talk about these topics and many expressed a sincere interest in learning more about fish preparation, pollution mitigation, and assessing risk.

Personal knowledge and accurate information about the risks of eating sport-caught fish varied considerably from individual to individual among the research participants. Official advisories and guidebooks, including online sources, offered a wealth of information about how to avoid or mitigate the effects of eating contaminated fish but this information rarely seemed to reach anglers in any coherent way. Instead, they pieced together their knowledge and beliefs over time from a range of sources, the most influential of which were friends, family, other anglers, personal experience, and the media.

A variety of mistaken beliefs weakened anglers’ assessments of the risks of eating locally caught fish. These included: pollution is obvious in water or in fish; clear water is not polluted; pollution comes only or mainly from active industry; the adverse health effects of eating contaminated fish are immediate; experienced anglers know where not to fish to avoid pollution; and spring-fed waters are unlikely to be polluted. Most anglers had a very limited understanding about how contaminants can bioaccumulate in both fish and humans and why this matters. Because they did not read the official guidebooks, few seemed aware, for example, that children are more at risk from eating contaminated fish, that consumption advisories apply even to healthy males, or that basic preparation techniques can affect whether contaminants are retained in fish flesh – for example, frying fish can seal in toxins that may drain away if the fish are cooked some other way (Burger et al. 2003).

On the other hand, some personal knowledge strengthened anglers' assessments of the risks of eating Calumet-caught fish. Many were very knowledgeable about local ecology and sought out the most ecologically healthy waterbodies for fishing. Many were also intimately familiar with local fishing spots and avoided the most contaminated waters either on purpose or by chance. Several people who had worked at local industrial facilities had first-hand knowledge of what pollutants had been dumped in specific waterbodies; this was always a motivation to avoid those places when fishing or to avoid eating caught fish.

It is important to note that the general message that eating fish is good for your health had gotten through to the vast majority of study participants through the media and other health information sources. In addition, for people who ate locally caught fish, the experience of eating Calumet fish over the years and not getting "sick" in any directly attributable way reinforced the notion that it was safe to eat Calumet fish. These two factors together make it even more difficult to convey cautionary information about fish consumption to Calumet anglers.

6.0 MANAGEMENT IMPLICATIONS

Fish consumption risk information is complex and difficult to apply to one's personal circumstances. Conflicting information is available from legitimate sources and it is not always clear what is safest or best. Like other studies, this research strongly suggests that state agencies and health officials cannot count on getting important fish consumption information to anglers through official guidebooks or advisories. Even the Internet may not be a viable outreach tool for older or low-income anglers and immigrants, especially recent immigrants. Instead, less conventional outreach methods may be necessary.

Two anecdotal examples about signage from this research provide food for thought. In one instance, an interviewee saw a sign at one site that said an herbicide had been applied in the water (to combat invasive Eurasian milfoil) and that fishing was prohibited for several days. He mistrusted the sign and thought that lake managers were trying to keep anglers away from an area that had recently been stocked with fish—and so he fished there

anyway. Another example highlights the management dilemma of providing signage about water pollution. One angler reported seeing an official-looking sign at one site that warned that the water was polluted. He heeded the warning and did not fish there. But seeing that sign led him to expect that signs would be posted wherever the water was polluted and that, conversely, sites without signs had clean water.

This research suggests that it may be effective to convey key information to Calumet anglers in person as often as possible and that thinking outside the cultural box may help reach elusive population segments. For example, members of Calumet sportsman's clubs are overwhelmingly non-Hispanic Whites so giving talks at sportsman's club meetings will not get important information to all anglers. Instead, outreach efforts might want to target non-angling groups like church social clubs or block groups. In addition, experienced anglers are already important and trusted sources of fishing and fish consumption information in Calumet. To capitalize on this, a "Master Anglers" program, modeled on Master Gardeners, could be created to offer classes and informational sessions on angling skills and safe fish-consumption practices to people who already enjoy fishing. This would produce local citizen experts who could disseminate important skills and information to others in the field while they are fishing.

The research interviews also uncovered hints of distrust among non-White anglers toward conservation officers and other law enforcement personnel. This suggests that anglers are not likely to turn to people in enforcement roles for information about the risks of eating locally caught fish and that people in law enforcement roles should work on building relationships and credibility with anglers before attempting to do informational outreach.

Additional suggestions for reaching out to Calumet anglers include focusing on the biggest known risks (specific fish species and specific waterbodies, for example) and targeting the most at-risk populations (non-Whites and people with health problems, for example). Instead of reaching out to anglers, it might make sense to present information to those who cook

sport-caught fish, perhaps with demonstrations of fish cleaning and cooking at local outdoor events or health fairs. Simple waterbody-specific handouts with pictures and clear messages might be effective outreach at fishing sites. For example, the Field Museum division of Environment, Culture, and Conservation is developing a comic book for anglers and their families that conveys in English and Spanish simple health safety messages about fish consumption. Finally, written and verbal communication efforts in Calumet – as in many urban areas – need to be in multiple languages and message crafters need to be sensitive to cultural issues for all local cultures.

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PLACE VISITATION, PLACE AVOIDANCE, AND ATTITUDINAL AMBIVALENCE: NEW CONCEPTS FOR PLACE RESEARCH IN URBAN RECREATION SETTINGS

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Abstract.—This paper draws on recent developments in research on consumer behavior and attitudes to better understand the range of behaviors and attitudes inherent in a diverse urban area. Using a mail survey of Chicago-area residents, we collected data (1) to examine residents' past visitation behavior and recommendations of places to visit and to avoid for a range of Chicago-area sites; and (2) to explore residents' attitudes (and distinguish between indifference and potential attitudinal ambivalence) toward the study sites using a bivariate model of attitudes. The study findings yielded insight into the mix of behaviors and attitudes that underlie urban recreation patterns and suggested several promising issues for future investigation.

1.0 INTRODUCTION

While many researchers study attractive places, our focus has been, and continues to be, on the less attractive places (a.k.a., "post-industrial areas," "brownfield sites") that cities and communities are thinking about redeveloping for housing, businesses, retail, and recreation – and to attract tourists. There is strong interest in reclaiming/restoring these less desirable urban areas for a variety of reasons: to provide an engine for economic development, to readdress environmental

justice issues, to provide more recreation opportunities for area residents, and to draw visitors and recreation users (and their dollars) from other areas.

2.0 CONCEPTUAL FRAMEWORK

While it is important to study the recreation potential of "less desirable" urban places, the lack of prior research on these types of places creates a major challenge. The current study addresses this challenge by focusing on two key elements: the place behaviors and place attitudes of the residents of a diverse urban region.

2.1 Place Behavior

A key perspective adopted in this research is that an urban area can be viewed as consisting of three types of places: those that people visit, those that people do not visit, and those that people avoid. The first two categories of places have received considerable attention from recreation researchers. For example, much has been written about place visitation/nonvisitation behavior (e.g., Manning 1999). The third category, places that people intentionally avoid, refers to a different type of behavior, place avoidance, that has received relatively little research attention.

Earlier work conducted by the first author on recreation choice in post-industrial urban areas (Klenosky 2005), indicated that certain areas of Chicago (particularly the Calumet area on the south side of the city) were viewed by some as being aversive/repulsive—that is, places to be intentionally avoided. (For further information on the Calumet area, see Klenosky et al., 2008). In another study conducted by the first author, visitors showed similar avoidance behaviors in a zoo setting (Klenosky and Saunders 2004); some zoo visitors reported that they intentionally avoided certain animal exhibits, specifically those involving snakes or insects. Visitors avoided the reptile house altogether or would enter the reptile house but focus on, for example, the pretty blue frogs while staying away from or refusing to look at the snakes.

Consumer behavior researchers have recently started studying why consumers intentionally avoid purchasing or consuming certain branded goods or patronizing certain places. Lee et al. (2008) identify three types of brand avoidance: (1) experiential brand avoidance, where negative firsthand consumption experiences lead to unmet expectations and inhibit future behavior (e.g., avoiding a store because of a bad experience); (2) identity avoidance, where the image of the brand is symbolically incongruent with the individual's identity (e.g., avoiding eating at McDonald's because that consumer never eats fast food); (3) and moral avoidance, which arises when the consumer's beliefs clash with the values associated with a brand. This last type of avoidance arises particularly when the consumer is concerned about the negative impact of a brand on society (e.g., avoiding or boycotting Nike products because of concerns about labor practices).

In studies related to the avoidance of places, researchers in tourism have looked at a related topic, the perceived risks of traveling in general or of traveling internationally (e.g., Roehl and Fesenmaier 1992, Sönmez and Graefe 1998a). Within this literature, two studies have touched directly on the issue of place avoidance but only at the country/region level. For instance, Sönmez and Graefe (1998b) examined countries that travelers might avoid because of concerns about terrorism or health. Lawson and Thyne (2001) looked at New Zealanders' reasons for avoiding specific countries and cities within New Zealand. In sum, while place avoidance has received some attention, researchers have yet to examine place avoidance involving recreation sites in a diverse urban environment.

Initial qualitative work conducted by the authors to explore place avoidance behavior involved one-on-one interviews with a small convenience sample of Chicago residents. In these interviews, participants were first asked to list places they had visited for recreation in the Chicago area and why. They were then asked about places they avoided and why. A key conclusion (or frustration) from that work was that while respondents were generally able and willing to talk about the places they visit for recreation, they were hesitant or reluctant to identify and talk about places that they intentionally avoid. Discussions of this initial effort with colleagues led the research team to adopt a third-party technique

to study place intentions, i.e., to ask respondents to recommend places for others to visit and avoid. Thus, the first contribution of the present study is a dataset of recommendations of recreation places to visit and avoid in a diverse urban area.

2.2 Place Attitudes

Attitudes are a person's overall evaluations of an object, person, place, or thing; attitudes are understood to have a fundamental influence on people's subsequent behaviors (Fazio 1986). To study place attitudes, the initial plan was to ask respondents to evaluate the place in question using a traditional bipolar attitude scale with "extremely positive" at one end, "extremely negative" at the other, and a neutral point in the middle. The use of this scale dates back to early psychological research by Thurstone (1928, cited in Cacioppo et al. 1997), who used bipolar psychophysical phenomena such as brightness (bright-dim) and temperature (hot-cold) as models or metaphors for his conceptualization of attitude. This bipolar conceptualization of attitudes assumes that the negative and positive evaluations are reciprocally activated (and thus perfectly negatively correlated). That is, like the position of the balance knob on a stereo audio system, as one's positive evaluation of an object increases, the negative evaluation decreases.

While the bipolar scale (and conceptualization of attitudes) has been very important in attitude research, recent work on attitudinal ambivalence suggests that attitudes are not always bipolar (Cacioppo et al. 1997). That is, people often hold simultaneous positive and negative evaluations toward an attitude object, especially one that is complex, such as a controversial social issue. Under such conditions, the simple bipolar scale does not provide a complete picture of one's attitude toward that object. The main problem has to do with the midpoint of the bipolar scale. Specifically, when indicating their attitude toward an object using a traditional bipolar scale (shown in Fig. 1A), people selecting point (A) would be classified as having a positive attitude. Conversely, people who select point (B) would be classified as having a negative attitude. If point (C) is selected, however, it is not clear whether those respondents are indifferent or neutral, or ambivalent (i.e., have mixed or conflicting feelings) about the object.

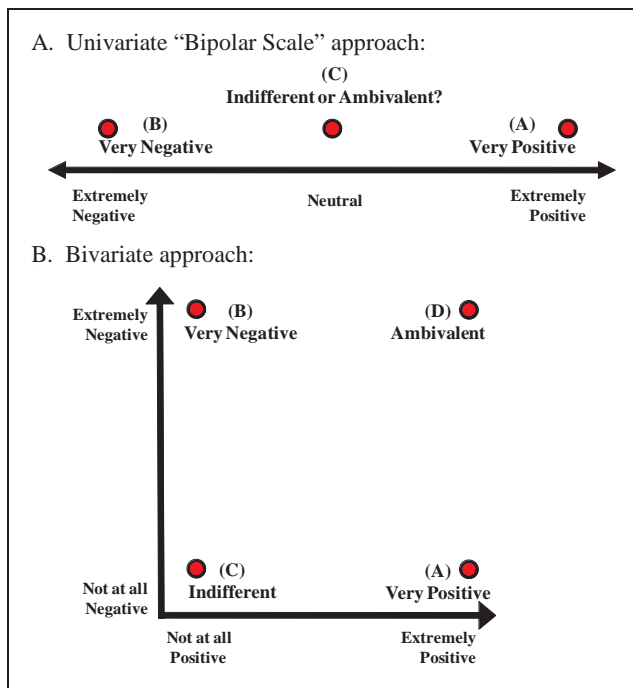


Figure 1.—Univariate “Bipolar Scale” approach (A) and bivariate approach (B) for studying place attitudes.

To overcome this shortcoming of the bipolar approach, attitude researchers have suggested that a bivariate approach should be used instead (Cacioppo et al. 1997). Specifically, Cacioppo and his colleagues have advanced a bivariate conceptualization of attitudes (known as the evaluative space model) that allows for positive and negative evaluations to exist independently. Under this approach, one measurement is used to assess degree of positivity toward the object involved, while another is used to assess degree of negativity. Similar to the traditional scale, those who score high on positivity and low on negativity would be classified as being very positive (point A in Fig. 1B) and those high on negativity and low on positivity would be very negative (point B). Importantly, however, those scoring low on both would be classified as indifferent (point C), while those scoring high on both would be classified as being ambivalent (point D), having a mixed or conflicting evaluation of the object. This bivariate approach thus allows one to differentiate between indifference and ambivalence in a way that the bipolar approach does not.

A central thesis of this research is that people often express ambivalence or mixed feelings—simultaneous “like and dislike,” “love and hate,” “attraction and

repulsion”—toward recreation places, especially those in urban areas. Such feelings were expressed informally to the research team during early research in the Calumet area of Chicago. Thus, a second contribution of this research is that it uses a bivariate approach to assess attitudes and to distinguish between indifference and possible attitudinal ambivalence toward urban recreation places.

3.0 STUDY OBJECTIVES

The main objectives of this research were: (1) to examine residents’ past visitation behavior and recommendations of places to visit and to avoid for a range of Chicago-area sites; and (2) to explore residents’ attitudes (and distinguish between indifference and potential attitudinal ambivalence) toward Chicago-area recreation places using a bivariate model of attitudes. To assess the full range of possible place attitudes, we compiled a list of places that included places we thought people would be attracted to, places people would avoid, and places that would be likely to evoke ambivalent attitudes. An additional aim of the survey was to assess public attitudes toward a new facility being developed on a specific brownfield site in the Calumet area of Chicago, the Ford Calumet Environmental Center (FCEC), which is located in the Hegewisch neighborhood.

4.0 METHODOLOGY

We administered a mail survey to a sample of 3,000 Chicago-area residents drawn from three ZIP code areas, one near and two away from the FCEC site. Each area centered on one ZIP code and included households located in a 5-mile radius of the geographic center of that ZIP code. The proximate area (i.e., in close proximity to the Calumet area of Chicago) was centered in Hammond, IN (population within 5 miles of 213,656) and the two nonproximate areas were centered in Clearing, IL (population 433,726) and Lincolnwood, IL (population 532,464). Each of the three radii is within 30 miles of the FCEC site and is on or near the edge of the Chicago city boundary. Thus, the 5-mile radius of each target sample area includes residents of the City of Chicago and nearby suburban communities. The proximate area includes both Illinois and Indiana residents. In each of the ZIP code areas,

50 percent of the households were drawn at or above the median household income for that 5-mile radius and 50 percent below the median. After three mailings (initial copy of survey, postcard reminder, and second copy of survey), a 14-percent response rate was achieved, resulting in a final n of 411 respondents. Although we were disappointed with the final response rate, we feel the responses that were obtained provided useful information for this preliminary study.

The self-administered survey consisted of seven sections: (1) measures of past activity behavior and interests; (2) ratings of awareness, visitation behavior, and recommendations to visit/avoid 22 specific places; (3) selection and rating of one place to “definitely visit”; (4) selection and rating of one place to “definitely avoid”; (5) ratings of intentions to visit/recommend the FCEC; (6) ratings of the Calumet area of Chicago; and (7) questions on basic demographic characteristics. The findings reported in this analysis include data obtained from sections (1), (2), (3), (4), (6), and (7) of the survey.

The 22 places examined in the survey were five frequently visited downtown recreation sites (in yellow in Fig. 2), three sites in the near-west part of the city (in green), four sites south of the city (in red), four sites to the north of the city (in blue), three sites in the west suburbs (in light blue), and two “national” sites, the Indiana Dunes National Lakeshore (in purple) and the Midewin National Tallgrass Prairie (in maroon).

5.0 RESULTS

The 411 respondents tended to be male (55.2 percent), between the ages of 45 and 64 (43.8 percent), and white (79.3 percent), and to have household incomes between \$55,000 and \$99,999 (39.6 percent).

5.1 Place Visitation and Avoidance Behavior

5.1.1 Past place visitation behavior

The first study objective was to examine past visitation and recommendations of places to visit and places to avoid for the 22 Chicago-area sites included in the survey. Respondents were directed to “imagine that



Figure 2.—Location of Chicago-area places listed in the survey.

friends of yours (friends that share many/most of your interests) just moved to the Chicago area. Imagine further that your friends developed a list of places in the Chicagoland area associated with outdoor recreation, nature and the environment that they were thinking about visiting. Your friends wanted to know the last time you visited each place; and whether you would recommend that they should visit or avoid each place.”

Analysis of the past visitation responses for the combined sample indicated that the most popular study sites were Grant/Millennium Park (which 70.2 percent of respondents visited during the past year), Lincoln Park (visited by 46.8 percent), Lincoln Park Zoo (40.3 percent), Shedd Aquarium (33.1 percent), Chicago Botanic Garden (27.1 percent), Indiana Dunes National Lakeshore (26.5 percent), and the Brookfield Zoo (26.4 percent). Study sites that were visited the least frequently included the Dan Ryan Woods Forest Preserve (5.5 percent), the Chicago Center for Green Technology (3.5 percent), and the Midewin National Tallgrass Prairie (visited by only 1 percent of respondents during the past year).

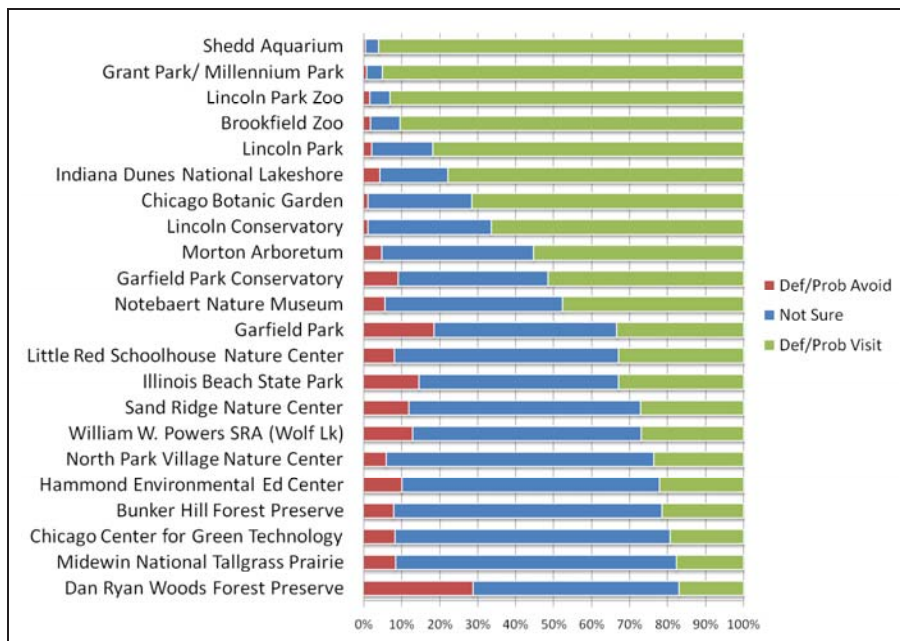


Figure 3.—Recommendation ratings for Chicago-area places listed in survey.

5.1.2 Recommendation ratings of places to visit/avoid

As shown in Figure 3, the places that received the strongest recommendation ratings as places to visit were the Shedd Aquarium (rated as a place to “definitely” or “probably visit” by 96.0 percent of respondents), Grant/Millennium Park (by 95.0 percent), Lincoln Park Zoo (93.1 percent), Brookfield Zoo (90.5 percent), and Lincoln Park (81.7 percent). In contrast, those receiving the strongest recommendation ratings as places to avoid were the Dan Ryan Woods (rated as a place to “definitely” or “probably avoid” by 28.8 percent of respondents), Garfield Park (by 18.5 percent), Illinois Beach State Park (14.5 percent), William Powers State Recreation Area (12.9 percent), and the Sand Ridge Nature Center (12.0 percent).

5.1.3 Recommendations of “One Place to Definitely Visit” and “One Place to Definitely Avoid”

Respondents were then asked to select one place from the list of places (or another place of their choosing) that they would recommend that their friends definitely visit. Respondents were also directed to rate that place on a series of scales. Of particular interest in this analysis were respondents’ ratings of their familiarity with the place listed (made using a 5-point scale ranging from “not at all familiar” to “extremely familiar”), degree of positivity (on a 5-point scale ranging from “not at all positive” to “extremely positive”), and degree of negativity (on a

similar 5-point scale ranging from “not at all negative” to “extremely negative”). Once respondents listed and rated a place to definitely visit, they then did the same set of tasks for a place to definitely avoid.

Although almost all respondents (406 out of 411, or 98.8 percent) identified a place to visit, only half (197 out of 411, 47.9 percent) identified a place to avoid. Once again, as in the pilot work we conducted, respondents were hesitant to identify a place to avoid.

The place listed most frequently to “definitely visit” was Grant/Millennium Park (listed by 105 out of 406 respondents, or 25.8 percent), followed by the Shedd Aquarium (by 10.3 percent), Brookfield Zoo (9.1 percent), Chicago Botanic Garden (8.6 percent), Indiana Dunes National Lakeshore (7.6 percent), the Lincoln Park Zoo (6.9 percent), the Museum of Science and Industry (4.6 percent), Navy Pier (3.4 percent), the Field Museum (2.2 percent), Sears Tower (2.2 percent), the Art Institute of Chicago (2.0 percent), and the Lakefront Trail (2.0 percent).

The places listed most frequently to “definitely avoid” included the Dan Ryan Woods Forest Preserve (by 58 out of 197 respondents, or 29.4 percent), Garfield Park (by 15.2 percent), and the Illinois Beach State Park (5.1 percent). Open-ended comments provided

by respondents indicated that these were places to avoid because they were viewed as unsafe or dangerous. Other places in this category included general regions such as the “south side of Chicago” (5.1 percent), and “projects, slums, and unsafe/high-crime neighborhoods” (3.0%), and specific locations such as Gary, IN (2.0 percent), Cabrini Green (1.5 percent), Hammond, IN (1.5 percent), and Washington Park (1.5 percent). It is notable that some sites (albeit a small number) were listed by some respondents as places to avoid and by other respondents as a place to visit. Lincoln Park Zoo (3.0 percent), Navy Pier (2.0 percent), Grant/Millennium Park (1.5 percent), Shedd Aquarium (1.5 percent), and the Brookfield Zoo (1.5 percent), fell into this category. These were places to avoid because of bad past experiences at those places or difficulties in reaching or parking at the site, or they were considered too expensive to visit, too crowded or busy, or too commercial or touristy.

5.2 Attitudes

The second study objective was to explore residents’ attitudes (and attitudinal ambivalence) toward three places: the place selected to definitely visit, the place selected to definitely avoid, and a place we thought was likely to reflect a mix of attitudes (the Calumet area of Chicago). In the survey, after selecting and providing ratings of respondents’ “one place to definitely visit” and “one place to definitely avoid,” participants read a description of (and viewed a location and layout map for) the FCEC. They then rated their intention to visit and recommend the FCEC. Next they were asked to provide ratings about the Calumet area of Chicago using the same three 5-point scales they had completed for the “one place to definitely visit” and “one place to definitely avoid” (i.e., ratings of familiarity, degree of positivity, and degree of negativity).

5.2.1 Summed place attitude scores

The first step in assessing attitudes toward the three places was to simulate what would happen if respondents rated the three places using the traditional bipolar attitude scale. Specifically, we created a summed attitude score for each of the three places by summing the separate ratings of positivity and negativity. Thus, if a place received a positivity rating of +4 and a negativity rating of -1, it would have a summed attitude score of +3; similarly,

if the positivity rating was 0 and the negativity rating -4, the summed score would be -4; and if the pairs of scores were either 0 and 0 or +4 and -4, the summed attitude score would be computed as 0. Using this approach, the summed scores could range from a low of -4 to a high of +4. The summed attitude scores for the three places are shown in Fig. 4. As would be expected, the mean summed score for the place to visit (Fig. 4A) was very positive (Mean = 3.1, SD = 1.32, n = 396). Similarly, the summed score for the place to avoid (Fig. 4B) was relatively negative (Mean = -1.7, SD = 1.664, n = 197). Interestingly, however, the summed score for the Calumet area (Figure 4C) was essentially normally distributed with a mean of zero (Mean = 0.1, SD = 1.831, n = 380). This result suggests that if a traditional bipolar scale were used to assess place attitudes, we probably would conclude that most people felt neutral or indifferent, rather than ambivalent, toward the Calumet area.

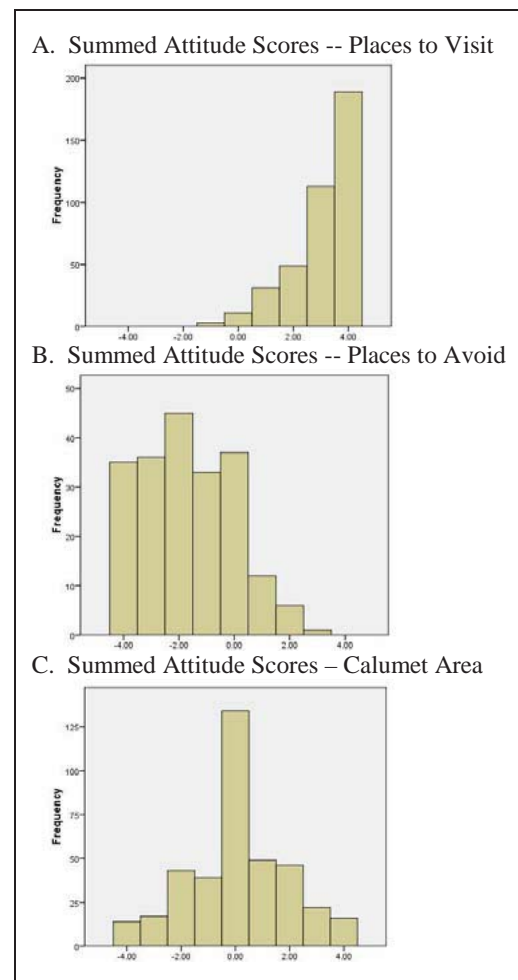


Figure 4.—Summed attitude scores for place to definitely visit (A), place to definitely avoid (B), and the Calumet area (C).

5.2.2 Bivariate place attitude ratings

The next step in the analysis was to examine attitudes toward the three places using the bivariate approach. The results of this analysis are shown in Fig. 5. The bivariate distribution for the “one place to definitely visit” (Figure 5A) shows that most responses clustered in the top right of the distribution, indicating moderate to strong positive evaluations toward the place they selected. The distribution for the “one place to definitely avoid” (Fig. 5B) shows that most responses cluster in the lower left of the distribution, indicating fairly strong negative evaluations. The conclusions for these two places correspond closely to those derived from the summed score analysis.

The bivariate distribution for the Calumet area tells a different story, however. In this case, most responses occur along the diagonal of the distribution, indicating a tendency toward either moderate ambivalence toward the Calumet area (i.e., bivariate responses of either +1 -1, +2 -2, +3 -3, or +4 -4 for the ratings of positivity and negativity, respectively) or indifference (0 0, no positivity and no negativity). Additional analysis indicates that the percent of respondents with ambivalent attitudes (scores of +1 -1, +2 -2, +3 -3, or +4 -4) was highest for the bivariate ratings of the Calumet area (93 out of 380, 24.5 percent of responses), next highest for a place to avoid (27 out of 205, 13.2 percent), and lowest for a place to visit (9 out of 396, 2.3 percent). These differences were significant (Chi-square = 83.389, $df = 2$, $p < .001$). The pattern was similar for those with indifferent attitudes (scores of 0 0). Once again the Calumet area was the highest (with 10.8 percent of the responses), the place to avoid next highest (4.9 percent), and place to visit lowest (0.5 percent). These differences were also significant (Chi-square = 40.270, $df = 4$, $p < .001$).

In sum, compared to the traditional bipolar approach, the results for the bivariate approach for assessing place attitudes resulted in a richer, more complete picture of how respondents felt about the three places examined. It also demonstrated how attitudinal ambivalence can be distinguished from indifference when place attitudes are evaluated.

A. Place to Visit						
Negativity Rating	Positivity Rating					
	0	1	2	3	4	
0	2	4	5	60	189	260
1	1	1	7	32	53	94
2	0	1	5	16	12	34
3	0	0	0	1	4	5
4	0	0	0	1	2	3
	3	6	17	110	260	396
B. Place to Avoid						
Negativity Rating	Positivity Rating					
	0	1	2	3	4	
0	10	3	1	0	0	14
1	5	8	2	3	1	19
2	8	14	17	6	2	47
3	18	30	9	1	1	59
4	35	18	7	5	1	66
	76	73	36	15	5	205
C. Calumet Area						
Negativity Rating	Positivity Rating					
	0	1	2	3	4	
0	41	8	10	11	16	86
1	6	24	20	30	11	91
2	10	20	62	19	6	117
3	12	31	12	6	2	63
4	14	5	2	1	1	23
	83	88	106	67	36	380

Figure 5.—Bivariate response distribution for place to definitely visit (Panel A), place to definitely avoid (Panel B), and the Calumet area (Panel C).

6.0 CONCLUSIONS

The overall goal of the study was to develop a better understanding of the place visitation/avoidance behavior and place attitudes of residents in a diverse urban area. We collected data on Chicago residents' recommendations of recreation sites to visit as well as less desirable sites to avoid. While only 50 percent of the sample recommended a place to definitely avoid, data collected on place avoidance behavior provide an important counterpoint to prior recreation research (which has tended to focus almost exclusively on place visitation behavior).

In addition to data on place behavior, we collected data using a bivariate approach to measure attitudes toward a place to definitely visit, a place to definitely avoid, and a place we believed would evoke a mix of attitudes (the Calumet area of Chicago). These data yield interesting insight into the range of attitudes in an urban environment and underscore the utility of using

a bivariate approach (instead of the traditional bipolar approach) to conceptualize and study place attitudes.

This research represents an initial effort to understand place avoidance and attitudinal ambivalence. Additional work is needed to explore the bases of these phenomena; to examine whether responses differed by race/ethnicity, income, or location; and to determine whether similar results would be obtained in other study settings. Furthermore, though not examined in the present analysis, data were obtained on residents' place attachment toward the three study sites (i.e., the place to definitely visit, place to definitely avoid, and the Calumet area). Like most recreation research, prior studies have focused on place attachment only in the context of positive/desirable places. Thus, exploring place attachment across a range of positive-negative sites in an urban area would represent an important extension of past work.

7.0 ACKNOWLEDGMENTS

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POSTER SESSION

HERITAGE TOURISM DEVELOPMENT IN RURAL RUSSIA: A CASE STUDY IN COLLABORATIVE TOURISM PLANNING IN AN INTERNATIONAL SETTING

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Abstract.—In the United States, advisers from such organizations as universities and extension services often assist rural communities with community planning and development efforts. These outside groups typically facilitate communication and discussion among stakeholders and help to lay out a process by which the community may proceed towards its shared goals. Faculty members from Concord University, West Virginia, were likewise invited to participate in the community planning process for a rural Russian community seeking to preserve a large historic estate and develop heritage tourism initiatives. Local stakeholders were enthusiastic about the project, yet many cross-cultural barriers slowed or obstructed the planning. Issues of Russian culture and the structure of local government have been identified as conditions that must be overcome for collaborative planning to work in a rural Russian community.

1.0 INTRODUCTION

Russia is undergoing a variety of industrial and social reforms as it attempts to move beyond its Communist past. Tourism and the infrastructure to support tourism were never developed under the Soviet Union. Today, however, the Russian republic recognizes the economic potential of tourism and is making efforts to modernize or develop the nation's attractions and tourism infrastructure. These development efforts are often

organized on a local level. Some areas show sophistication in tourism development while others are struggling to begin the process.

Russia has significant historical and cultural resources to offer as tourism attractions. Although St. Petersburg and Moscow have well developed attractions and infrastructure, rural communities in the outlying regions are just beginning the process of identifying, developing, and marketing potential destination sites.

The village of Yurino is located on the Volga River in the Mari-El Republic. During the 19th century, the Sheremetovs, one of Russia's wealthiest families, had their estate in Yurino. The family fled Russia during the Communist Revolution and the manor house and estate fell into disrepair. Today, community leaders in Yurino are seeking to restore the manor and estate to attract visitors from cruise ships passing on the Volga and other international tourists who are seeking historical and cultural experiences. The Russian people have a deep pride in their cultural artifacts, but this pride does not always translate into objective decisionmaking in regards to cultural preservation and marketing.

Yurino's leaders have actively sought input from individuals with heritage or international tourism credentials. When faculty from Concord University (West Virginia) first visited the site, local officials made statements that indicated that United States-based tourism educators were an important source of expertise and guidance. Even at this early stage in the process, local planning appeared still to revolve around an "expert" model of planning. Later work stressed the inclusion of more stakeholders representing more constituencies. These efforts to involve more stakeholders would prove challenging.

2.0 METHODS

During two visits to the development site at Yurino, the study group participated in a variety of formal and informal meetings with stakeholders and state and local

government officials. In addition to formal meetings, there were debriefings and discussions with the Russian students and interpreters who accompanied us. After the meetings, researchers made notes (they did not take notes during meetings) and sought points of agreement. Areas in which there was not broad agreement among researchers are not included as discussion points in this case study.

3.0 RESULTS AND DISCUSSION

While many potential models of development are available, Gunn and Var (2002) propose a straightforward eight-step model that fits the needs of the Yurino development very well. We present the study team's observations in the framework of the Gunn and Var model to the extent that current research and site development allow.

- 1) Identify sponsorship and leadership
- 2) Set goals
- 3) Investigate strengths and weaknesses
- 4) Develop recommendations
- 5) Identify objectives and strategies
- 6) Assign priorities and responsibilities
- 7) Stimulate and guide development
- 8) Monitor feedback

As of this writing, the Yurino development has reached the fourth element of this framework.

3.1 Sponsorship and Leadership

Local residents and local government officials are strongly motivated to develop the Sheremetov estate to attract visitors. The town of Yurino is primarily an agricultural community with few employment opportunities. Local people and town officials see the historic estate as a mechanism for creating jobs and a more varied economy. They have made a variety of contacts in Russia and internationally to move the project forward and have been successful in getting initial seed money from the state government to begin the restoration process. No single organization has been willing to provide ongoing sponsorship and funding.

3.2 Set Goals

At this time Yurino developers' primary goal is to create economic opportunities within the community. Secondary goals are the protection of local heritage and the provision of recreational and social opportunities to local residents.

3.3 Investigate Strengths and Weaknesses

The strengths of the Yurino community development include:

Outstanding cultural site. The critical elements of the Sheremetov estate are present and the key buildings are structurally sound. Approximately a third of the main house has been restored with money from the state government. In addition, the site is located on the Volga River, providing scenic attraction and a water-based recreation opportunity. Marcouiller and Prey (2005) point out the importance of natural amenities such as these to tourism site development.

Potentially good location. While the location is approximately a 3-hour drive from the nearest major population center, it is located on the Volga River. One of Russia's most popular and growing tourism activities is cruise ship travel and river cruises routinely pass the development site. Large tracts of forest and clean, fishable streams are a short distance from the community, making ecotourism activities a potential package opportunity.

The following issues were identified as challenges to be overcome in the development of Yurino and the Sheremetov castle site:

Remote location. Russia is a large place and the development site is remote. While cruise ship traffic may provide a base of visitors to the site, special efforts will have to be made to attract visitors from other locations. As international visitors are still rare in rural Russia, initial efforts at market development will target the closest urban areas and seek to develop the domestic tourism market.

Short cruise season. The river freezes in winter and most companies offer tours only between May and mid-October.

Limited tourism experience. Local tourism developers have little experience meeting the demands of either domestic or international visitors. Efforts will have to be made to give tourism developers and service providers a better sense of both national and international tourism standards.

Management of the estate. The manor house is currently under the stewardship of the state government, which has classified it as a historic site. While this classification does not preclude various forms of development or commercial use, it does require a high degree of consensus before permission for further development will be given.

3.4 Recommendations

At this stage of the project, three recommendations have been made.

- 1) Plan and implement special events that will highlight the unique attributes of the site and increase awareness of the destination. Festivals that focus on local culture and history would serve to increase the awareness of residents of nearby cities to the features of the destination.
- 2) Develop waterfront facilities that will a) facilitate site visits by cruise ships and cruise ship passengers, and b) serve as an amenity site with food service and entertainment in a relaxed waterfront setting.
- 3) Identify a wider audience of stakeholders to invite into the planning process. Cruise ship companies, private investors, national historic preservation groups, and lodging franchises may all bring valuable input and resources.

3.5 Obstacles

While tourism destination planning is a challenging exercise in any context, a variety of cultural factors have added to the complexity of this project. These

issues became apparent after the second planning visit. Local residents are pessimistic about a cooperative planning model. This observation is consistent with Russians' current views of their political environment (Pipes 2004, McFaul 2005, Kasputin 2008) and was reiterated by several of our collaborators and interpreters. Community members see public meetings as a way for the government to make people feel involved, but residents expect that officials will do what they want in the end. This viewpoint certainly limits the participants' enthusiasm and may have caused some important stakeholders to stay away from the planning process.

Another issue in the planning process was a lack of data. Information relevant to feasibility analysis is not readily available in Russia. Researchers from the United States are used to operating in an environment of information access. A wide variety of organizations routinely survey visitors at local, state, and regional levels. Numerous reports, resource inventories, and databases provide a basis for assumptions about visitation numbers and patterns. In many other countries, information about tourism trends and visitor motivation is also readily available and cost estimates for business start-ups are fairly easy to obtain. By contrast, visitor surveys and visitor preference studies are rare in Russia while estimates for construction or development costs are not readily offered by vendors. In fact, asking about these types of numbers is often discouraged.

4.0 CONCLUSIONS

The problems and issues facing small rural communities in Russia are actually very similar to those faced by small communities in the United States. There are significant differences in the tools available to solve those issues and in the amount of experience that stakeholders have in community-based planning; these factors are readily apparent to U.S.-based tourism planners. As the process of tourism development in Yurino slowly moves forward, the use of community development tools will continue to be studied.

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BOOMERS AND SENIORS: THE DRIVING FORCE BEHIND LEISURE PARTICIPATION

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Abstract.—The 76 million Americans in the Baby Boomer population are the force behind the changing demographic picture of society today. Boomers' spending habits and lifestyle choices will also have a powerful influence on retirement and leisure in the coming decades. Boomers will redefine retirement and are expected to demand more than current senior programs and facilities offer. It will be profoundly important for recreation professionals to understand the leisure values of this cohort in order to provide adequate programs, facilities, and services. The purpose of this study was to explore the recreation and leisure values and preferences of tomorrow's seniors—as compared to current and past generations of seniors—to try to understand what boomers will be seeking in community recreation programs. Differences in the recreation and leisure values and preferences of boomer generation men and women are also explored.

1.0 INTRODUCTION

The United States is home to nearly 76 million Baby Boomers (people born between 1946 and 1964). The first wave of America's boomer generation will turn 65 years old in the year 2011 and their varied life experiences, values, and expectations will shape their notions of retirement (Cochran 2005). Since their births, the boomer generation has received significant attention from demographers, politicians, marketers, and social scientists. Boomers are unique in their popular culture and values, and they are healthier, wealthier, and more educated than any past generation (Freedman 1999). Boomers are known for working hard, playing hard, and spending hard (Ziegler 2002).

Boomers are going to redefine retirement as they have redefined every stage of their lives (Dychtwald 1999). Based on their past and current lifestyles, they are expected to remain active in retirement, demanding dynamic, vibrant programs rather than being the passive recipients of services (Cochran et al. 2006). In response, recreation professionals will need to recognize that boomers have different leisure values and interests than past generations of seniors. These professionals must be prepared to deliver a wide range of leisure opportunities and to address a new set of demands from the boomer generation (Cochran 2005).

1.1 Purpose

The purpose of this study was to explore the recreation values and community recreation preferences of tomorrow's seniors. Previous research provides significant information about leisure motivations, leisure constraints, and the impacts of leisure satisfaction on the lives of seniors in various age groups, specifically those age 70 years and older (Ragheb and Griffith 1982, Russell 1987, Crawford et al. 1991, Valler and O'Connor 1991). However, little is known about the leisure value differences between boomers and today's seniors or about the differences between men and women in these two age groups. This study focused on non-moral leisure values regarding leisure program participation. Non-moral leisure values can be defined as "personal assessments of the worth or utility of leisure" (Jeffres and Dubos 1993, p. 205). Examples include the social benefits of leisure, the physical benefits derived from an activity, or even the feeling of general goodwill that can result from participating in leisure activities (Kretchmar 2004).

2.0 METHODS

We conducted a mail survey focusing on leisure participation values and divided the respondents by age into "Boomers" and "Current Seniors." Further analysis was conducted by gender. The six categories of leisure values on the survey were "Competitive," "Educational," "Physiological," "Social," "Relaxation," and "Aesthetic." The overarching research question was,

Table 1.—Demographics

Age Group	Male (<i>percent</i>)	Female (<i>percent</i>)
Boomers (n= 114)	31	69
Seniors (n=71)	46	54

“Is there a statistically significant difference between boomers’ and seniors’ gender preferences and leisure participation values in each of these six areas?” In other words, do the leisure activity preferences of male and female boomers and seniors differ because of their sense of competitiveness, need for education, desire for socialization, physiology, desire for relaxation, and/or aesthetic factors?

2.1 Participants

A voter registration list was obtained for two townships in western New York. A short list of residents over the age of 50 was compiled. This process yielded a population pool of 4009 persons. After obtaining approval from Institutional Review, we mailed surveys to a random sample of 1002. Two hundred and eighteen surveys were returned after a second reminder was mailed, resulting in a response rate of 22 percent. This percentage is generally considered to be a low response rate for a survey (Babbie 1990, Aday 1996), but according to Vissner et al. (1996) and Keeter et al. (2006), a low response rate on direct mail opinion surveys does not necessarily yield inaccurate results. Demographic information about the participants is provided in Table 1.

2.2 Survey

The survey was modified from an existing Customer Satisfaction Survey administered at the local senior center. Survey items also included elements from the Cochran Baby Boomer Quiz (Cochran 2005) to address leisure participation values and the importance of participation in recreation activities. Respondents were asked to rate the importance of 23 different reasons why they might participate in leisure and recreation activities (for example, “to compete against others,” “because I am good at it,” and “to improve my skills or knowledge”). Response options ranged from 4-“very important” to 1-“not important”. Each of the 23 reasons belonged to one of the six categories of non-moral values (Competitive, Educational, Physiological,

Social, Relaxation, and Aesthetic). The Competitive Value measured the importance of competitiveness as a motivation to participate in recreation activities. The Educational Value measured the importance of participating in recreational activity for educational purposes. The Physiological Value measured how important recreational activities were for physiological development and relaxation for the participant. The Social Value measured how important it was to participate in recreational activities for the purpose of being with family, friends, or others. The Relaxation Value measured the importance of “doing something different from work” or having time to oneself. Finally, the Aesthetic Value measured the importance of “simply for pleasure” and “to enjoy nature” in recreation. The items that corresponded with each subscale are listed in Table 2.

The second section of the survey requested demographic information about age, gender, level of education, gross annual income, and race.

Table 2.—Leisure participation values

Value	Sub-items
Competitive	To compete against others Because I am good at it To show others I can do it To improve skills or knowledge For a challenge For excitement For risk and adventure
Educational	To learn new skills and abilities To be creative To expand my intellect
Physiological	For physical health or exercise Relaxation of mind, body, spirit
Social	To keep me busy To help my community To be with my family To do things with my friends To meet new people For cultural interaction
Relaxation	Something different from work To be alone To be away from family
Aesthetic	Simply for pleasure To enjoy nature

2.3 Leisure Participation Values

Respondents' composite scores were tallied for each subscale; the possible scoring range for each subscale depended on how many items were in that subscale. For example, 7 items were related to competitiveness and each item could be scored between 1 and 4, for a total composite range of 7 to 28. Likewise, only 2 items were in the Physiology and Aesthetic subscales, for a total composite range of 2 to 8. During analysis, composite scores for each of the six subscales were divided into three levels: "high," "medium," and "low." For example, for Competitiveness, a composite score of 7-14 = Low, 15-21 = Medium, and 22-28 = High. For Physiology and Aesthetics, a composite score of 2-4 = Low, 5-6 = Medium, and 7-8 = High.

2.4 Reliability

Reliability analyses (Cronbach's alpha) were conducted on the four subscales and the composite items. The Recreation and Leisure Participation subscale was found to have a high internal consistency reliability ($\alpha = .85$), and six composites yielded an internal consistency coefficient of .74. Face validity for the instrument was established through consultation with a panel of experts.

2.5 Data Analysis

The Statistical Package for Social Sciences (SPSS®), version 16.0 (SPSS, Chicago, IL), was used for data analysis. Descriptive statistics were calculated for demographic items and all subscales. Frequency statistics and chi-square analysis were conducted to answer the research question regarding the difference between male and female boomers and seniors' leisure participation values.

3.0 RESULTS

The mean age of the participants was 60.47, SD = 7.090. Of the participants, 61.6 percent were classified as boomers and 38.4 percent were classified as seniors based on age.

The chi-square analysis revealed a significant difference between observed and expected responses of males and females regarding the level of importance of three of the six composite variables for leisure participation:

educational values ($\chi^2_{(2)} = 10.281, p < .05$), physiological values ($\chi^2_{(2)} = 10.733, p < .05$), and social values ($\chi^2_{(2)} = 7.360, p < .05$). See Table 3. Educational values are related to learning new skills, being creative, and expanding knowledge and understanding. Fewer male boomers (25.7 percent) than female boomers (55.8 percent) reported a "high" preference for the educational value of leisure participation. Physiological values measure participation based on health or exercise and the relaxation of mind, body, or spirit. Our findings revealed a difference between male and female boomers regarding their preference within the physiological value of recreation activities. Significantly more male boomers (17.1 percent) than female boomers (1.3 percent) had "medium" composite scores for physiological values. Social values are related to being with family and friends, meeting new people, or engaging in community and cultural interactions. More male seniors (30.8 percent) reported being "low" on the social value scale for leisure participation than did female seniors (5.4 percent). This difference implies that male seniors place less importance on the social value of leisure than female seniors.

There were no statistically significant differences between the genders for both the boomer and senior groups regarding level of preference for the other three leisure participation values: "competitive," "relaxation," and "aesthetic."

4.0 CONCLUSION

The purpose of this study was to explore what tomorrow's seniors are seeking in community recreation programs by collecting information about their recreation and leisure values. Leisure programming includes a number of approaches and theories, but the key for recreation planners and leisure service providers is always to understand the values of the cohort being served (Cochran et al. 2009). This study identified significant differences between men and women and between today's seniors and soon-to-retire boomers in three areas of recreation/leisure participation values. Further, the results provide insight into the potential differences in leisure activity patterns between boomers and seniors by gender, therefore allowing recreation professionals to develop a variety of meaningful leisure opportunities beyond today's senior programs.

Table 3.—Level of preference for specific leisure participation values among male and female boomers and seniors (percentages and chi-square tests)

Variables		Percentages			χ^2
		High	Medium	Low	
Competitive (N=172)					
Boomers (n=107)	Male	12.5	71.9	15.6	.527
	Female	13.3	65.3	21.3	
Seniors (n=65)	Male	6.7	76.7	16.7	1.716
	Female	17.1	65.7	17.1	
Educational (N=176)					
Boomers (n=112)	Male	25.7	37.1	37.1	10.281*
	Female	55.8	28.6	15.6	
Seniors (n=64)	Male	40.7	37.0	22.2	3.368
	Female	59.5	32.4	8.1	
Physiological (N=182)					
Boomers (n=114)	Male	80.0	17.1	2.9	10.733*
	Female	93.7	1.3	5.1	
Seniors (n=68)	Male	74.2	19.4	6.5	2.491
	Female	81.1	18.9	.0	
Social (N=173)					
Boomers (n=110)	Male	14.7	58.8	26.5	3.11
	Female	28.9	43.4	27.6	
Seniors (n=63)	Male	19.2	50.0	30.8	7.360*
	Female	27.0	67.6	5.4	
Relaxation (N=175)					
Boomers (n=112)	Male	5.9	32.4	61.8	.355
	Female	9.0	33.3	57.7	
Seniors (n=63)	Male	3.7	25.9	70.4	1.645
	Female	.0	33.3	66.7	
Aesthetic (N=179)					
Boomers (n=113)	Male	65.7	22.9	11.4	3.720
	Female	82.1	12.8	5.1	
Seniors (n=66)	Male	62.1	27.6	10.3	.705
	Female	70.3	18.9	10.8	

*p-value significant at the .05 level. There were significant differences between observed and expected responses of boomer and senior males and females regarding the preference of leisure activities for *Educational*, *Physiological*, and *Social* leisure participation values.

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The content of this paper reflects the views of the authors(s), who are responsible for the facts and accuracy of the information presented herein.

Q AND YOU: THE APPLICATION OF Q METHODOLOGY IN RECREATION RESEARCH

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Abstract.—Researchers have used various qualitative and quantitative methods to deal with subjectivity in studying people's recreation experiences. Q methodology has been the most effective approach for analyzing both qualitative and quantitative aspects of experience, including attitudes or perceptions. The method is composed of two main components—Q sorting and Q factor analysis—and allows for the simultaneous study of objective and subjective issues. This paper describes Q methods and terminology, past uses of Q in various fields of research, and the pros and cons of applying Q in research on recreation experiences.

1.0 INTRODUCTION

Many studies in recreation are concerned with perceptions, attitudes, points of view, or opinions regarding variables or theories of interest. Recreation researchers have used both qualitative and quantitative techniques to explore the subjectivity inherent in recreation experiences. Moore and Driver (2005) have criticized the use of traditional methods to study the subjective experiences associated with outdoor recreation. Brown (1996) discusses the problems with the qualitative/quantitative dichotomy in research and critiques traditional researchers' need to select and adhere to either qualitative or quantitative methods. One research methodology that transcends this argument is Q methodology. Because Q is neither fully qualitative nor fully quantitative, Q researchers can draw upon components and values of both. This paper introduces Q methodology, its value in recreation research, and the integral parts of Q—Q sort and Q factor analysis.

Q methodology is the systematic study of subjectivity (Brown 1980, 1993, 1997; Stephenson 1953). It is used to identify and categorize participants' attitudes, beliefs,

and viewpoints. Wilson (2005) describes Q methodology this way:

It has been referred to as a bridge between qualitative and quantitative research. It has the same level of mathematical rigor as quantitative methodology, it provides for direct measure, and has an interpretive component comparable to that of qualitative methodology. It is designed to (a) elicit operant subjectivity and (b) directly measure the response. It is not about a person. It is of a person. (p. 37)

By combining the strengths of both qualitative and quantitative research, Q methodology allows for the simultaneous study of objective and subjective issues to determine an individual's perceptions and forecast the likelihood of participation (Cross 2005).

The basis of Q methodology is the Q sort technique, followed by Q factor analysis. Q sort is the vehicle of Q methodology, the means by which the data are collected for factor analysis (Brown 1980). This process involves rank-ordering a set of statements taken from a concourse (the flow of communication on a topic; see section 4.0 below) (Brown 1980, McKeown and Thomas 1988), with responses along a continuum that usually ranges from agree to disagree (Brown 1980, 1993, 1997; Cross 2005). The Q sorts are then analyzed using correlation and factor analysis.

Q methodology takes advantage of the fact that individuals "desire to structure and ascribe meaning to all impinging stimuli and events" (Harvey as quoted in Watts and Stenner 2005, p. 76). The desire to structure stimuli, ascribe meaning, or offer a viewpoint with any set of statements provides the strength of Q methodology. It is this desire that gives a Q sample the potential to reveal useful results using both the qualitative and quantitative properties inherent in the methodology.

With all research, the research question(s) and context influence the choice of research method(s). Q is considered an exploratory technique and is not appropriate for the development and proposal of specific hypotheses as in traditional positivist methodology (McKeown and Thomas 1988, Watts and Stenner 2005, Durning and Brown 2007). While the results of a Q study cannot be interpreted to confirm or reject hypotheses in terms of a significance level, Q “can, however, bring coherence to research questions that have many, potentially complex and socially contested answers” (Watts and Stenner 2005, p. 75). Theory constructed using a Q sample can be interpreted in terms of a logical connection or consistency to respond appropriately to various research questions. Quantitative methods may ask, for example, “What proportion of users value an outdoor recreation experience?” Q methodology research questions are more exploratory, such as, “What are the perceived benefits and values of participating in an outdoor recreation experience?” The two approaches use different strategies that are useful for different research processes, purposes, contexts, and agendas (Robbins 2005).

The ranking of statements by each participant in Q methodology can appear to be similar to tests, scales, and questionnaires. However, the role of the participant, the manner in which the data are collected, and the interpretation of the data all set it apart from typical survey research (Brown 1980, 1993, 1997; Van Exel and de Graaf 2005; Watts and Stenner 2005). In Q, researchers do not suggest or impose meanings a priori, but rather let the participants determine what is meaningful, valuable, and significant from their perspectives.

2.0 Q SORT

The Q sort process is an instrument used to capture the subjectivity expressed during the sorting procedure. Q set statements or stimuli are transferred onto separate cards, randomized, and numbered (Brown 1980, 1993). Participants are then given conditions of instruction with the statements after which they usually start with a preliminary sorting into three categories of agree, disagree, and other (Brown 1980, 1993, 1997). They then sort within their three categories to correspond

with the quasi-normal distribution based upon select conditions of instruction.

It is very rare that participants perform a complete (1 to n) rank order (Watts and Stenner 2005) but typically sort according to a quasi-normal forced distribution that causes every Q sort to have a mean of 0 (Brown and Ungs 1970, Brown 1980, and McKeown and Thomas 1988, Watts and Stenner 2005). The *distribution* of statements has very little effect – it is the *order* of statements that matters (Brown 1980, 1993, 1997). Tests of validity are not a concern in the Q sorting process, since participants simply express their points of view in a formal and explicit manner and there is no outside criterion to validate or invalidate their viewpoints (Brown 1980, 1997; Durning and Brown 2007).

3.0 P SET

In contrast with other research methods, conducting a census of a population using Q is impossible. Rather than randomly selecting participants, Q sampling purposefully selects individuals to make sure that certain viewpoints are included based upon the research question (Brown and Ungs 1970). Durning and Brown (2007) state, “The categories may be somewhat imprecise, but this is of little concern in Q methodology because these categories, unlike the demographics in conventional research, are not typically used for testing purposes” (p. 544). Once the functional categories are established, the number of participants needed for the study can be determined based on the research questions. It should be noted that major relationships begin to stabilize with just a few cases, and they are influenced very little when additional observations are included in the study (Brown and Ungs 1970). The following example illustrates this point.

Q avoids the “numbers games” in a certain sense because it studies qualitative differences, on which quantity has no effect. If you wish to examine the differences in color between a tub full of green and a tub full of red paint, for instance, a thimble of each will do and buckets full from the same tubs will only provide redundant information. Similarly, in Q: If you are interested in examining the differences between the thinking of factor A vs. factor B,

three or four of each will do and buckets full will not advance understanding markedly. (Brown 1996, p. 563)

As such, Q studies generally do not need a large sample of participants (as other methodologies require for statistical power). Brown (1980, 1993) asserts that no more than 40 participants are necessary to represent the viewpoints of a population. Watts and Stenner (2005) state that most Q studies are effective with 40-60 participants, but this is merely a guideline and “highly effective Q studies can be carried out with far fewer participants” (p. 79).

4.0 CONCOURSE

A collection of attitudes, or subjective communicability, about an event or topic is what is referred to as the “concourse.” This collection can be infinite because it includes “all the manifestations and expressions of human response and dialogue, verbal and nonverbal” (Wilson 2005, p. 42). More specifically, the variety and range of opinions about a particular event or topic constitute the raw materials of Q methodology or human science in its subjective respects (Brown 1993, 2006). Concourse statements are distinguished from fact statements in that fact statements cannot be refuted while concourse statements are based on opinion (Durning and Brown 2007).

5.0 Q SAMPLE/Q SET

Researchers may find, it impractical to use an extremely large concourse. Therefore, it is usually necessary to take a representative sample of statements from the concourse (Brown 1980, 1993, 1997; Durning and Brown 2007). The Q sample, or Q set, is a set of statements that offers the fullest range of viewpoints (Karim 2001). However, unlike a population of people, the concourse population is impossible to define due to the infinity of potential statements. Yet rather than sampling statements randomly from the concourse, Q methodology uses experimental design principles in developing the Q set (Durning and Brown 2007).

Stephenson (1993/1994) argues that nature is inherently simple and that the same principles should guide the development of the concourse and the Q sample.

Accordingly, the concourse is governed by a few simple principles. The first is that a concourse is approached on a “prima facie” basis that can encompass any statement from the concourse. The second is that only statements that are based on self-reference, or are subjective, should be included. To apply these two principles, the construction of Q samples should be based on Fisher’s “balanced block” design, wherein there is a systematic basis in the Q set (Stephenson 1953, 1993/1994; Brown 1980, 1993; McKeown and Thomas 1988). Fisher’s balanced block design is used to gain a more representative sample of the concourse and to provide structural information, which is a first step in scientific experimentation.

Ideally, the goal of the Q set is to provide the fullest range of viewpoints based on the concourse (Karim 2001, Durning and Brown 2007). Furthermore, Dennis (1992-1993) and Fairweather (1981) found the test-retest reliability of Q sets to be at 0.80 and above. Therefore, the Q set does not depend on traditional issues of validity because a viewpoint expressed by one individual is just as valid as another expressed viewpoint and cannot be deemed invalid (Brown 1980, 1997; Durning and Brown 2007). Even when different subjects interpret the same statements differently, the important information is what meanings the participants derive from the statement, not the a priori meanings imposed by the researcher.

Although Q statements are not always theory-based, theory can aid in the development of the Q sample. Q samples can be developed from many sources, including academic literature, literary and popular media, interviews, and discussions, as long as the Q set is representative of the views, opinions, and attitudes in the concourse. “In the end, the exact task [of developing a Q sample] is of little consequence provided that the final Q set can justifiably claim to be broadly representative of the relevant opinion domain...” (Watts and Stenner 2005, p. 75).

Furthermore, there is no specific number of statements that should be used in the Q set. Watts and Stenner (2005) contend that studies with 40 to 80 Q statements are considered satisfactory, while Brown (1980) argues that 40 to 50 statements are adequate as long as they are

comprehensive. Cross (2005) even argues that Q studies can be carried out with as few as 10 statements because participants have the opportunity to express their point of view (Brown and Ungs 1970). However, Brown and Ungs counter that the more statements a person has to work with, within reason, the more likely it is that the person will express personal attitudes. Generally, the size of the Q sample is determined by the number of multiples of the basic design (Brown 1980). For example, five or six statements are taken from each category of the Fisher's "balanced block" design, which in turn will help ensure that statements are comprehensive.

6.0 FACTOR ANALYSIS

Q methodology is often mistakenly thought of as merely the transposition of a traditional factor analysis matrix because it involves factoring by rows the same matrix that is traditionally factored by columns (Brown 1980). Traditional factor analysis (often referred to as R form) is a statistical technique used to study the relationships between variables or traits. As such, R scores are often expressions of individual differences for the various traits of individuals. By contrast, Q factor analysis utilizes abductive reasoning from observed effects. Other differences between the Q and R factor analysis include the importance of the Eigenvalues and total variance (Brown 1980). Q methodology is more gestaltist and holistic, and Eigenvalues typically have little meaning as they are founded on an arbitrary number of individuals (Brown 1980). Likewise, traditional factor analysis often breaks up the phenomenon into separate components, but this is not the case with Q methodology where participant self-reference is maintained (Stephenson 1993/1994). Brown and Ungs (1970) further state that:

The factors that result from a Q study... in a very real sense are the results of behavior—that is, they exist as the consequence of a group of respondents having responded in the same fashion... Factors in Q technique studies arise from actual concrete operations of persons as they model their attitudes; a factor is the result of behavior. The factor-categories are genuine, as opposed to *ad hoc* categorical, and reflect true attitudinal segmentation. They are more genuinely "operational definitions" of

this-or-that attitude, since whatever they are definitions of has been made manifest by virtue of behavioral operations expressed through the medium of Q technique. (p. 519).

Q methodology operates on the assumption that observations and measurement can take place only from the external frame of reference based on internal processes that are inferential and hypothetical but defined by the prevailing variables (Christol 2002). The correlations derived from the initial correlational matrix of the individual Q sorts are simply "a way station and a condition through which data must pass on their way to revealing structure" (Brown 1993, p. 110). It is possible to determine the degree of similarity or dissimilarity between participants' Q sorts from the correlation matrix. The most important aspects of the analysis, however, are the factor arrays (Brown 1980, McKeown and Thomas 1988, Watts and Stenner 2005). Factor arrays, along with other analysis output, elucidate the viewpoint being expressed by a particular factor. Unlike other methods that use exploratory factor analysis to determine which individuals group together on what factors, Q methodology is primarily interested in the belief and preference systems that cause the factors (Durning and Brown 2007).

Brown (1993) also states that factor analysis reveals the number of factors, which is purely empirical and wholly dependent on how the Q sorts were performed. Nevertheless, the factors are qualitative categories of thought and additional participants would have virtually no impact on the factor scores. Brown (1980) points out that "quality is operationally distinct from quantity" (p. 120) and that quality can be judged by the composite factor reliability. Quality is a function of the number of defining variates; therefore, the more people that render a point of view, the greater the confidence in the scores that compose it. Furthermore, since reliability is inversely related to the standard error, the higher the reliability, the lower the standard error.

One objective that Q methodology does not accomplish well is estimating population statistics. Generalizations are not thought of in terms of induction, or the few representing the many (Christol 2002). Instead, the

aim is to sample the diversity and range of viewpoints expressed by the participants (Cross 2005). The proportion of individuals in a factor is not revealed in the factor analysis; yet, distinctive points of view in the form of statements that distinguish each factor are revealed. The composition of the particular individuals that make up the factor is rarely of direct interest because the same viewpoints could be obtained from other individuals; however, the ways in which the factors differ are of keen interest (Brown 1980). As such, generalizations in Q do not refer to demographics, but to segments of subjective communicability (Brown 1980). The concurrence of ideas is sampled representatively instead of using the more traditional means of random sampling theory related to the population of participants (Stephenson 1953). Therefore, Q methodology seeks to capture and interpret communicated points of view that may be generalized back to the phenomenon being studied rather back to the population. Q methodology utilizes by-person factor analysis, instead of the traditional by-variable analysis, to identify groups of participants who factor comparable items together (Watts and Stenner 2005). "Nothing more complicated is at issue" (Watts and Stenner 2005, p. 68).

7.0 IMPLICATIONS FOR OUTDOOR RECREATION RESEARCH

Q methodology was originally developed for use in psychology research. Since then, it has been used to study participants' attitudes, viewpoints, or perceptions in studies on healthcare, business, marketing, political science, and environmental science, to name a few (Brown 1993). Q methodology has been used successfully but very infrequently in outdoor recreation research. Lindhagen and Hornsten (2000) used Q methodology to study how forest management techniques influenced preferences and changes in recreational use over a 20-year period. Hirsh (1992) employed Q methodology to research Canadian university outdoor education programs. Christol (2002) explored differences in environmental educators' beliefs in two countries. Ward (2008) used Q methodology to explore perceptions of risks and benefits associated with mountaineering. Rilling and Jordan (2007) looked at different points of view toward leadership on extended outdoor trips. Lindley (2005) studied how participating in a wilderness experience program influenced students' attitudes towards

wilderness. Hutson and Montgomery (2006) conducted an inquiry using Q methodology to explore perceptions of outdoor recreation settings and ways of feeling close to natural environments. Finally, Wilson (2005) used Q methodology to study person-place engagements and user attachments to a recreational area in Oklahoma.

8.0 CONCLUSION

Recreation researchers have increasingly used approaches that explore and value the subjectivity of recreation experiences (Stebbins 1997). Q methodology systematically and thoroughly integrates subjectivity into the research process and provides a "bridge" between qualitative and quantitative research (Cross 2005, Wilson 2005). By combining the strength of both quantitative and qualitative research, Q methodology can be a valuable tool for those who wish to study outdoor recreation experiences.

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OUTDOOR RECREATION—TRAILS

EXPERIENCE USE HISTORY AND ITS RELATIONSHIP TO MANAGEMENT ACTIONS AND SATISFACTION

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Abstract.—This paper analyzes the relationship between recreationists' patterns of prior experience and their preferences for and satisfaction with specific management actions. A mail-back survey was administered to a random sample of 1,500 off-highway vehicle (OHV) owners in Utah, and data for this study come from the 600 owners who completed the questionnaire. The sample was segmented into four experience use history groups based upon respondents' number of OHV trips during the past 12 months and the total number of years they had been riding OHVs. These four groups' preferences for and satisfaction with five specific management actions were then compared. Results show that patterns of prior experience are related to the importance placed upon three management actions: adequate provision of trailhead facilities, presence of adequate signage, and presence of law enforcement. There were no significant differences among any of the five satisfaction measures.

1.0 INTRODUCTION

Over the past four decades, off-highway vehicle (OHV) use has become one of the most rapidly growing outdoor recreation activities in the United States (Cordell et al. 2005). Because of the large increase in participation, federal land managers and other recreation planners badly need information on how to meet recreationists' demands while minimizing resource degradation and conflict. Related recreation research would also benefit from a foundational understanding of the unique nature of OHV use and its users. This paper begins to address

these needs by examining how OHV users' preferences for and satisfaction with management actions relate to their prior experience with the activity.

To a large extent, the provision of high quality recreation experiences depends upon managers and planners being aware of how recreationists differ, what experiences they seek, and how they perceive their environment. Consequently, identifying within-activity differences has long been a goal of both recreation researchers and managers. The study of prior experience is one approach to identifying within-activity differences that is easily understood by managers and useful to researchers. Prior experience is a particularly useful analytical approach for recreation researchers because it is grounded in cognitive development theory and represents a link between external behavior and the internal cognitive states that constitute attitudes, feelings, and motivations. Given prior experience's dual benefit to both managers and researchers, this study will employ it to explore within-activity differences among OHV users. More specifically, prior experience will be used to understand differences in the importance placed upon specific management actions, as well as different satisfaction levels with those actions.

2.0 RELATED LITERATURE

2.1 Experience Use History

Prior experience is the sum of accumulated life experiences a recreationist has within a particular activity (Virden 1992). Prior experience theoretically informs perceptions of recreation experiences; understanding individuals' prior experiences is therefore important to understanding their motivations and attitudes. Prior experience is particularly useful for recreation research because it represents similar cognitive structures created through recreationists' amount, type, and diversity of participation (Schreyer et al. 1984).

Prior experience either at a particular site or with a particular activity has frequently been employed as a method for segmenting recreationists. Typically, prior

experience is used to analyze within-activity differences with respect to a variety of dependent variables such as site choice (Watson et al. 1991, McFarlane et al. 1998) or place attachment (Hammitt et al. 2004, White et al. 2008). Segmenting users according to prior experience is usually completed based upon recreationists' total number of previous visits to an area, total length of time visiting an area, and/or their frequency of visitation to an area or similar areas (Hammitt and McDonald 1983, Schreyer et al. 1984, Ibitayo and Virden 1996).

Identifying experience use history groups has been useful in exploring variability within specific groups of recreationists. For example, individuals with similar patterns of prior experience have been shown to have similar perceptions of recreation conflict (White et al. 2008), similar perceptions of crowding (Graefe and Moore 1992), and similar views toward depreciative behavior (Ibitayo and Virden 1996).

2.2 Experience Use History and Management Preferences

Previous research suggests that a recreationist's past experience with an activity is a proxy measure for their exposure to and familiarity with management actions, and therefore informs their perceptions of current resource management. In a survey of raft floaters and tubers in eastern Tennessee and western North Carolina, preferences for 8 out of 12 management actions were significantly different across three levels of prior experience (Hammitt and McDonald 1983). These findings, as well as the guiding hypothesis of this research, are grounded in the assumption that recreationists with more experience are likely to be more familiar with resource conditions and resource management, therefore making them more likely to favor different forms of management than less experienced recreationists (Jacob and Schreyer 1981). This point will be rejoined later in the paper as we examine the results of this study of Utah OHV owners.

3.0 METHODS

3.1 Data Collection

For the purposes of this study, OHVs are defined as any non-street-legal recreational vehicle, such as all-terrain

vehicles, dune-buggies, rock-crawlers, and off-highway motorcycles. While over-snow machines are often included under the umbrella term "OHV", they were not included in this study. The state of Utah requires that all OHVs be registered with the Utah Department of Motor Vehicles. We acquired this list and adjusted it so that an individual's probability of selection would be independent of the number of vehicles owned. We mailed a survey to a random sample of 1,500 owners. We administered the survey according to a modified Dillman Method (Dillman 2000). Three waves of surveys were sent with reminder postcards sent between mailings. Of the 1,500 surveys sent, 84 were returned because respondents had moved or died. Out of the 1,416 Utah OHV owners who received surveys, 600 returned completed surveys, for a 42.4 percent response rate.

3.2 Experience Use History (EUH) Groups

Despite the simplicity of the EUH concept, different methodological approaches have been used to segregate recreationists based upon their prior experience. Most approaches consider the EUH concept multidimensional, consisting of both length and frequency components. Beyond this area of agreement, researchers differ on appropriate operationalization of the concept. EUH research addressing experiences or perceptions of specific recreation settings has often segregated groups based on experience indexes created from researcher-defined high, medium, and low categories of both the length and frequency variables (Hammitt and McDonald 1983). Setting-specific approaches include simple segregation based on whether a recreationist has visited the area before, which can be differentiated further based upon general experience with the activity (Schreyer and Lime 1984). The most common method has been to split recreationists into high/low categories based upon both frequency of recreation participation in the previous 12 months and the total number of years they have participated in the activity (Schreyer and Lime 1984, Williams et al. 1990, Hammitt et al. 2004, Backlund et al. 2006). Other methods include independent analysis of the length and frequency measures (Watson et al. 1991, Budruk et al. 2008), and a one-dimensional operationalization composed solely of the number of years a recreationist has visited an area (White et al. 2008).

Table 1.—Comparison of experience use history groups

	Group Identification				F (sig.)
	M (SD)				
	Casual Veterans (n = 217)	Casual Newcomers (n = 181)	Frequent (n = 21)	Occasional (n = 124)	
Years riding	30.09 (8.816)	6.97 (3.969)	18.52 (10.870)	22.60 (9.983)	281.614***
No. of times riding in last 12 months	5.14 (3.180)	6.00 (4.402)	60.60 (23.749)	17.77 (6.015)	575.162***

Because this study is not site-specific, segregation based upon visitation to specific OHV riding areas or to the diversity of OHV riding areas would be misplaced. We believe conceptualizing EUH as a product of both length and frequency of past experience is important in identifying unique patterns of participation and helps divide participants into the most heterogeneous groups. A two-dimensional approach is also more directly tied to the cognitive development theory that grounds EUH research. Based upon these criteria, the experience use history of OHV riders for this study was determined by 1) the total number of years they had been riding; and 2) the total number of times they went riding over the previous 12 months. Data for both of these variables were standardized, with the most heterogeneous groups being identified through a K-means cluster analysis procedure. Four distinct means were specified for interpretation and consistency with prior research (i.e., to retain the quadrant structure of prior experience patterns (Hammitt et al. 2004, Backlund et al. 2006)). The cluster analysis procedure eliminates problems of dealing with two variables of different scales; it also enables the most heterogeneous groups to be identified, working around problems of splitting variables at their medians. Continuous measures of both experience levels can also still be explored through Pearson correlation coefficients to lend support to findings.

3.3 Management Actions

Five specific management items were included in the survey instrument. Respondents were asked to rate how important each management action was and how satisfied they were with current management provisions. Responses were obtained through a 5-point Likert scale, where 1 = *not important at all* or *extremely dissatisfied* and 5 = *extremely important* or *extremely satisfied*. The five items explored were:

- The availability of information, which includes information about rules, hazards, and conditions that may be included in maps, brochures, newsletters, or online
- Trailhead facilities, including restrooms, water, unloading ramps, signs, garbage receptacles, and camping areas
- Site maintenance, which includes facilities and the OHV trail or area
- Signage, such as directional, reassurance, information, and caution
- Law enforcement, which includes the enforcement of rules and regulations by ranger patrols or other enforcement officials

4.0 RESULTS

4.1 Group Identification and Characteristics

The K-means cluster analysis was specified to determine the four most homogenous groups based upon the two prior experience variables. These groups were subsequently identified according to their patterns of prior experience as *casual newcomers*, *casual veterans*, *frequent*, and *occasional* (Table 1). The groups were significantly different in the number of years they had been riding ($F_{3, 539} = 281.61, p < .001$), and in their frequency of trips over the previous 12 months ($F_{3, 539} = 575.16, p < .001$). The *casual newcomers* were identified by their relatively short length of involvement in the activity, as well as the relatively few number of trips they take per year. The *casual veterans* were identified by their relatively long length of activity involvement and the relatively few trips they took over the past year. The *frequent* riders were identified as such because they take far more trips per year than the other groups. Finally, *occasional* riders were those riders who participate in the

Table 2.—Socio-demographic characteristics of Off-Highway Vehicle owners by experience use history group

	Experience Use History Group				Entire sample
	Casual veterans	Casual newcomers	Frequent	Occasional	
Mean Age	50.0	49.2	41.7	44.9	48.6
% Completing 4 year college degree	25.1	31.5	25.0	29.9	28.3
Income (Modal Category)	\$75,000 - \$99,999	\$50,000 - \$74,999	\$75,000 - \$99,999	\$50,000 - \$74,999	
% Married	87.7	86.9	76.2	83.6	86.0

Table 3.—Differences in importance for management actions across and between experience use history groups

Management Action	Experience Use History Groups					All groups
	Comparison across all groups	Casual Veterans	Casual Newcomers	Frequent	Occasional	
Provision of Information	$F_{3, 530} = 0.02$	4.01	4.02	4.00	4.03	4.02
Provision of Trailhead Facilities	$F_{3, 531} = 2.50^*$	3.83 ^a	3.78	3.62	3.52 ^a	3.73
Provision of Site Maintenance	$F_{3, 531} = 0.23$	4.01	4.01	3.86	3.96	3.99
Provision of Signage	$F_{3, 531} = 3.12^*$	4.05 ^a	4.24 ^{abc}	3.81 ^b	3.96 ^c	4.08
Provision of Law Enforcement	$F_{3, 532} = 1.31$	3.69	3.74	3.90	3.53	3.68

Note. Groups with significant differences are noted with similar superscripts.

activity more often than both of the *casual* groups, yet far less often than the *frequent* riders.

The socio-demographic characteristics of the four groups are in Table 2. The entire sample of OHV owners was predominantly white (98.4 percent), married (86.0 percent), and self-identified as politically conservative (59.5 percent). The frequency distributions of respondents' ages across EUH groups were significantly different from expectations ($\chi^2 = 39.70$, $df = 15$, $p = 0.001$). The obvious deviation came from the fact that *frequent* riders tended to be younger compared to those in other groups. However, we found no significant relationships between EUH group membership and income ($\chi^2 = 17.82$, $df = 18$, $p = 0.468$) or group membership and education ($\chi^2 = 14.82$, $df = 15$, $p = 0.464$).

4.2 EUH and the Importance of and Satisfaction with Specific Management Actions

Using simple one-way ANOVAs, we found that EUH is related to two of the five importance questions ($p \leq 0.05$). The comparisons across all groups, as well as the between-group differences, are reported in Table 3. OHV owners with different patterns of prior experience also

gave significantly different rankings to the importance of providing adequate trailhead facilities. Between-group comparisons reveal that *casual veterans* (riders who had been riding for a relatively long time but on average take fewer than six trips per year) differed significantly from *occasional* riders. Given the two groups' similar length of activity involvement, this finding suggests that increased frequency of participation in the activity is related to a decreased need for developed trailhead facilities. OHV riders with different patterns of prior experience also exhibited significant differences in the importance placed on the provision of signage. Post-hoc tests revealed that *casual newcomers* differed significantly from every other EUH group. This finding suggests that both increased frequency of participation and increased length of involvement in the activity are related to a decreased need for trail or area signage.

Next, we followed the same analytical procedure to test for significant differences across the four EUH groups with regard to satisfaction with the provision of each of the five management actions. The results of our analysis revealed no significant differences in satisfaction with management based on patterns of prior experience.

5.0 DISCUSSION

As mentioned previously, the guiding hypothesis of this research is the assumption that recreationists with more experience are likely to be more familiar with resource conditions and resource management, and are therefore more likely to favor different forms of management than less experienced recreationists. However, we found significant variations in only two out of five management actions and our findings therefore offer only mixed support for this assumption.

The findings of this study can inform future research in four distinct ways. First, the research has shown that understanding the effects of prior experience on the importance placed on specific management actions can produce results that are both theoretically and managerially informative. Second, this study has shown that prior experience, which is often relegated to the margins of recreation research in favor of more robust (e.g., recreation specialization) or more psychologically focused (e.g., enduring involvement) measures, can lead to a new understanding of how cognitive structures influence perceptions of recreation experience and preferences for certain management actions. Analyzing patterns of prior experience remains a useful and informative framework for examining within-activity differences. Third, our analytical approach to defining EUH groups through a clustered solution was an appropriate method for differentiating the most heterogeneous subgroups within the activity group. Finally, our analysis provides insight into OHV recreation, which is rapidly becoming an extremely popular outdoor recreational activity.

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*HUMAN DIMENSIONS
OF WILDLIFE*

NORMATIVE STANDARDS FOR WILDLIFE VIEWING IN PARKS AND PROTECTED AREAS

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Abstract.—With increasing public interest in wildlife watching, there is a need to develop methods to inform the management of high-quality viewing opportunities. In this study, normative methods using indicators and standards of quality were applied at a national park in Alaska and a wildlife refuge in New Hampshire. Four potential indicators of quality are identified that can be used to help define and manage wildlife viewing opportunities, and a range of potential standards of quality are developed for these indicator variables. In general, normative standards of visitors to the two study areas were salient and moderately to highly crystallized. Study findings indicate that visitors are currently experiencing high-quality wildlife viewing at both sites.

INTRODUCTION

In 2006, nearly a third of U.S. residents age 16 or older participated in some form of wildlife watching. Approximately 23 million people traveled a mile or more from home to view wildlife (National Fishing, Hunting and Wildlife Associated Recreation 2006). Nationwide, the activity increased 8 percent between 2001 and 2006, outstripping participation rates in hunting and fishing (Reed 2008). As public involvement grows, providing wildlife-viewing opportunities has become an increasingly important component of outdoor recreation planning and management.

Normative methods (i.e., indicators and standards of quality) provide one approach to understanding the components of satisfying wildlife viewing experiences. Indicators and standards are central to carrying-capacity frameworks that address questions about how many people and what types of activities parks can accommodate without creating unacceptable social and ecological changes. Indicators are defined as “measurable, manageable variables that help define the quality of parks and outdoor recreation areas and opportunities”, while standards define “the minimum acceptable condition of indicator variables” (Manning 2007, p. 27).

Normative methods were applied to wildlife viewing in a study at Katmai National Park, Alaska. Visitors were asked to specify the acceptable number of people on bear-viewing platforms (Whittaker 1997). Results indicated that wildlife-viewing experiences could be maintained while increasing capacity through the addition of several small platforms, but not through the addition of a few large platforms. Two studies in Colorado asked residents to evaluate the acceptability of a range of management actions in response to the behaviors of three wildlife species. Normative standards varied based on the species type, animal behavior, and proposed management response (Whittmann et al 1998, Zinn and Manfredo 1998).

Good wildlife viewing indicators should be specific and related to human use; be sensitive to changes; occur over relatively short time periods; be compatible with management objectives; and be of importance to visitors, managers, and stakeholders (Manning 1999, Manfredo 2002). With these guidelines in mind, this paper reviews indicators and standards of wildlife viewing developed at a national park in Alaska and a wildlife refuge in New Hampshire.

2.0 METHODS

Data were collected at two diverse parks/protected areas: Lake Umbagog National Wildlife Refuge (“Lake Umbagog”) in New Hampshire and Denali National Park and Preserve (“Denali”) in Alaska. Established in 1992, Lake Umbagog provides important habitat for wetland species and migratory birds. Among the species living around the lake are bald eagles, common loons, great blue herons, hooded mergansers, and osprey. The refuge is a prime location for moose viewing (Lake Umbagog Area Chamber of Commerce, n.d.).

Visitors to Lake Umbagog were surveyed in 2006 and 2007 from July to August. Surveyors were stationed at the refuge’s four primary access points during daylight hours on preselected random survey days. They approached each group as it left the refuge. The self-administered questionnaires included open- and close-ended questions about indicators and standards of quality at each location. One hundred ninety-seven questionnaires (77-percent response rate) were collected for the 2006 survey, which focused primarily on indicators. For the 2007 survey, which focused on standards, 193 questionnaires (76-percent response rate) were completed.

Among the many species of wildlife found at Denali National Park are moose, caribou, Dall sheep, wolves, and grizzly bears. Visitors reach the park, and views of wildlife, via the park’s only road. At 91 miles in length, the Denali Park Road is accessible only by bus. Shuttle buses and interpretive bus tours are run by park concessionaires (Denali National Park and Preserve, n.d.).

Visitors to the Denali Park Road were surveyed in 2006 and 2007 from July to August. Data on indicators of quality were collected in 2006 through semi-structured qualitative interviews. One hundred twenty-six interviews and two focus-group sessions were recorded, transcribed, and analyzed to identify potential indicator variables. Data on standards of quality were collected the following year via self-administered questionnaires. Five types of bus users were targeted: those riding on general shuttle buses, camper shuttle buses, Kantishna Lodge buses, and two types of tour buses. Visitors were approached as they disembarked from buses during normal times of return.

Seven hundred and seven questionnaires (78-percent response rate) were completed.

3.0 RESULTS

3.1 Lake Umbagog Indicators and Standards

Wildlife viewing emerged as an important indicator of quality at Lake Umbagog. In an open-ended question about the three things participants most enjoyed about their visit to the refuge, they most often mentioned interactions with wildlife, eagles, loons, and fish (22 percent of respondents), ahead of the recreational activity participated in (21 percent of respondents), the quiet, tranquil, and relaxing atmosphere of the refuge (13 percent), and the natural environment and scenery (13 percent). Regarding activities participated in, more than 85 percent of visitors spent time viewing loons, ducks, eagles, and other birds on or near the water (88 percent in 2007), while 52 percent spent time photographing wildlife (44 percent in 2007), and 34 percent watched moose (73 percent in 2007). Visitors considered these activities to be moderately to extremely important (Table 1). When given a list of 12 potential items that could be important to determining the quality of their experience at the refuge, visitors evaluated the two items related to wildlife the most highly (Table 2). Visitors were asked about the minimum acceptable percentage of visitors who would get to see species identified as important indicators. Standards for wildlife viewing ranged from 43.8 percent (SD=33.7) for moose to 50.6 percent (SD=33.7) for ospreys, 51.5 percent (SD=34.6) for eagles, 61.7 percent (SD=34.1) for loons, and 67.8 percent (SD=32.4) for other waterfowl.

3.2 Denali Indicators and Standards

Wildlife viewing also emerged as an important indicator of quality along the Denali Park Road. When asked to list the three things most enjoyed about their trip along the road, interviewees most frequently mentioned wildlife (69 percent of 126 participants), followed by scenery and mountains (66 percent), and information provided by the bus driver (39 percent). When visitors were asked what they expected their trip along the road would be like, seeing plenty of wildlife (18 percent) or seeing more wildlife than they actually saw (27 percent) were the most

Table 1.—Importance of wildlife-viewing activities to Lake Umbagog visitors

Activity	Importance				Mean
	Not at all Important (%)	Somewhat Important (%)	Moderately Important (%)	Extremely Important (%)	
Viewing loons, ducks, eagles, ospreys, and other birds on or near the water	0.6	6.9	26.9	65.7	3.6
Viewing moose	6.3	13.9	29.1	50.6	3.2
Wildlife photography opportunities	4.7	10.4	29.2	55.7	3.4

Table 2.—Importance of activities in determining the quality of Lake Umbagog visitor experience

Activity	Importance				Mean
	Not at all Important (%)	Somewhat Important (%)	Moderately Important (%)	Extremely Important (%)	
Seeing wildlife	4.0	7.6	21.2	67.2	3.52
Visitors disturbing loons, eagles, and other wildlife	7.6	7.6	14.6	70.2	3.47
The noise of boats	8.7	13.8	20.9	56.6	3.26
The speed of boats	9.6	12.7	23.9	53.8	3.22
The number of motor boats on the lake/rivers	10.2	17.3	26.0	46.4	3.09
The number of boats on the lake/rivers	11.2	19.9	39.3	29.6	2.87
Parking at access sites	14.9	26.3	34.5	24.2	2.68
The number of visitors to the refuge	10.2	26.4	36.5	26.9	2.80
Large groups of visitors/boats	13.6	25.8	32.8	27.8	2.75
Catching fish	31.5	21.8	20.8	25.9	2.41
Congestion at popular fishing spots	32.0	26.8	18.6	22.7	2.32
The number of canoes/kayaks on the lake/rivers	41.1	31.8	17.7	9.1	1.94

frequently mentioned items. Seeing more or less wildlife than expected were the reasons most often listed by respondents who felt that their trip was better or worse than expected. When asked about stopping to observe wildlife, visitors responded that stopping and taking adequate time to enjoy wildlife (44 percent) was the most important aspect in the quality of their experience, followed by the bus driver's providing information and assistance with wildlife viewing (17 percent).

Based on the indicators identified in the qualitative interviews, standards were measured for three dimensions

of wildlife viewing: (a) the number of buses seen along the road at wildlife stops, (b) the waiting time to see wildlife (as buses queued at wildlife stops), and (c) the percent chance of seeing a grizzly bear.

To measure standards for the number of buses seen along the road at wildlife stops, respondents were presented with a series of eight photographs in which the number of buses varied from 0 to 12 (Fig. 1). Respondents were asked to rate the acceptability of each photograph on a 9-point scale ranging from -4 = "very unacceptable" to +4 = "very acceptable." Visitors were then asked to



Figure 1.—Sample of study photographs showing different use levels at wildlife stops along the Denali Park Road.

choose the photograph that showed the use level they (a) would prefer to see, (b) would find so unacceptable that they would no longer visit, (c) thought was the highest level of use that the National Park Service (NPS) should allow, and (d) thought looked most like the level of use they experienced during their visit. Acceptability ratings decreased as the number of buses at wildlife stops increased, as shown in the social norm curve in Figure 2. Van der Eijk's measure of agreement (Krymkowski et al., in press) ranged from 0.19 for four buses to 0.86 for 12 buses, indicating moderate to high levels of crystallization (i.e., amount of variance around each measure). The social norm curve crossed the neutral point of the acceptability scale (i.e., fell out of the acceptable range and into the unacceptable range) at 4.7 buses at one time. Visitors preferred to see an average of 1.6 buses, felt the NPS should take management action (i.e., limit use of the road) at 5.5 buses, would be displaced at 7.9 buses, and typically saw an average of 2.8 buses.

To determine the normative standard for the waiting time to see wildlife, respondents were asked to rate the acceptability of waiting times from 0 to 15 minutes.

Acceptability levels decreased as the waiting time increased, as shown in the social norm curve in Figure 3. Van der Eijk's measure of agreement ranged from 0.07 for waiting times of 5 minutes to 0.90 for no waiting time, indicating moderate to high levels of agreement. The social norm curve crossed the neutral point of the acceptability scale at 4.63 minutes.

Similarly, to measure the standard for chance of seeing a grizzly bear, respondents were asked to rate the acceptability of five chances, ranging from a 100-percent chance to a 0-percent chance. Acceptability levels decreased as the chance decreased, as shown in the social norm curve in Figure 4. Van der Eijk's measure of agreement ranged from 0.09 for a 25-percent chance of seeing a grizzly bear to 0.67 for a 100-percent chance of seeing a grizzly bear, indicating moderate to high levels of agreement. The social norm curve crossed the neutral point of the acceptability scale at just under a 25-percent chance of seeing a grizzly bear. A high percentage of visitors (83 percent) indicated that they saw a grizzly bear during their trip along the Denali Park Road.

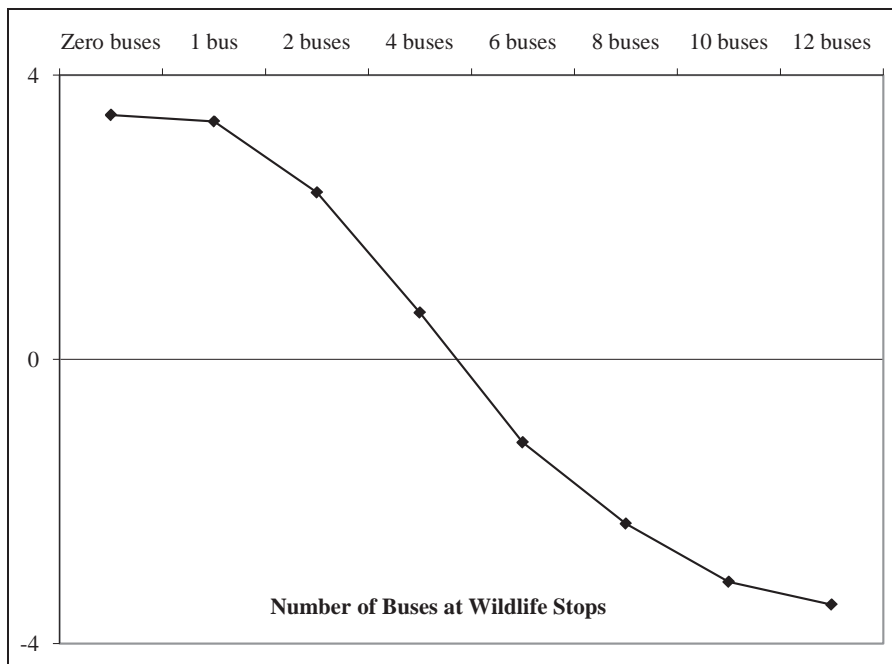


Figure 2.—Acceptability of buses at wildlife stops. *Mean values and Van der Eijk's agreement scores were 3.44, 0.80 (0 buses); 3.35, 0.83 (1 bus); 2.35, 0.58 (2 buses); 0.66, 0.19 (4 buses); -1.17, 0.29 (6 buses); -2.31, 0.58 (8 buses); -3.13, 0.78 (10 buses); and -3.45, 0.86 (12 buses).

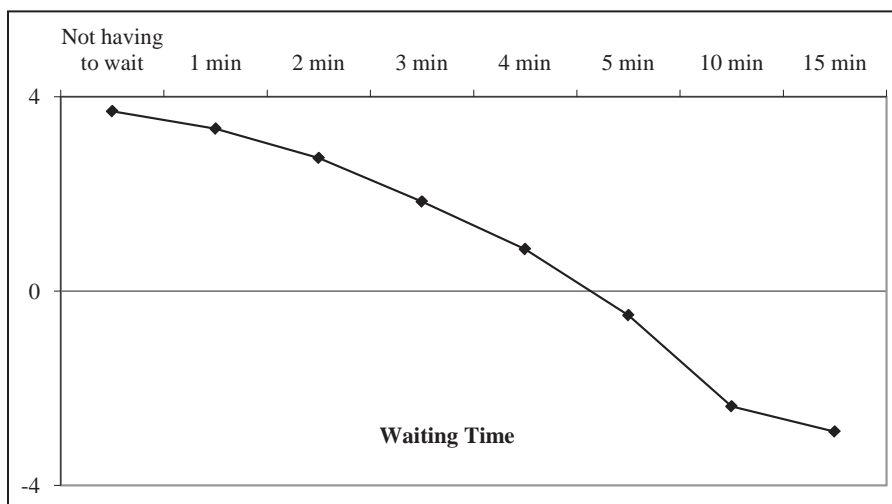


Figure 3.—Acceptability of waiting to see wildlife. * Mean values and Van der Eijk's agreement scores were 3.70, 0.90 (not having to wait); 3.34, 0.83 (1 minute); 2.74, 0.67 (2 minutes); 1.84, 0.45 (3 minutes); 0.86, 0.17 (4 minutes); -0.50, 0.07 (5 minutes); -2.37, 0.57 (10 minutes); and -2.89, 0.70 (15 minutes).

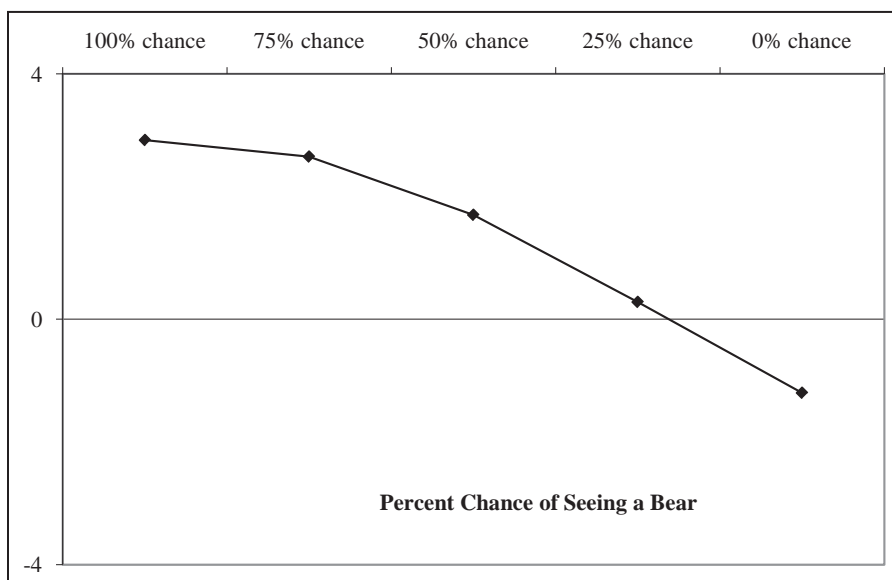


Figure 4.—Minimum acceptable chance of seeing grizzly bear. * Mean values and Van der Eijk's agreement scores were 2.92, 0.67 (100% chance); 2.65, 0.65 (75% chance); 1.70, 0.39 (50% chance); 0.28, 0.09 (25% chance); and -1.20, 0.18 (0% chance).

4.0 DISCUSSION

Visitor surveys and interviews indicated that wildlife viewing is an important component of the visitor experience at two diverse natural areas. Based on study findings, we identified four wildlife-viewing indicators and developed normative standards for these indicators.

Two of the indicators and standards measured in the Denali study related to visitor experiences upon encountering wildlife. Visitors found up to 4.7 buses at wildlife stops and waiting times of up to 4.6 minutes to see wildlife to be acceptable. High norm intensities (i.e., strength of feeling) for both variables suggest that these two indicators are important to the quality of the visitor experience. Results for the different evaluative dimensions used for the former variable indicate that the park is now providing a high-quality experience with regard to the number of buses at wildlife stops. While visitor preferences were lower than the number of buses typically seen, acceptability-, management action-, and displacement-based norms were all higher than the number of buses typically seen. Agreement, or crystallization, scores averaged 0.61 for the number of buses and 0.55 for waiting times, suggesting that social norms for these two indicator variables are robust.

Findings related to chances of seeing wildlife varied based on the species. At Lake Umbagog, the minimum acceptable percentage of visitors to see wildlife ranged from 49 percent for moose to 72 percent for waterfowl. At Denali, a 25-percent chance of seeing a grizzly bear was minimally acceptable. To a certain extent, these differences may reflect realistic expectations for seeing wildlife. For example, moose are most likely to be active at dawn or dusk. During warm summer days, moose are likely to be found in shaded forest areas, away from roads and other clearings. Waterfowl, on the other hand, are most abundant at the refuge during summer months (Lake Umbagog Area Chamber of Commerce, n.d.). Given that visitors completed surveys during the day in the summer months of July and August, they probably had a smaller chance of seeing moose than waterfowl. Data from the 2006 survey support a difference in viewing opportunities between the two species; while

more than 85 percent of visitors said that they saw loons, ducks, eagles, and other birds during their visit, just 34 percent said that they saw moose.

On the other hand, the relatively low standard of a 25-percent chance of seeing a grizzly bear at Denali does not match up with the reality at the park. More than 82 percent of visitors reported seeing a grizzly bear during their trip. Agreement scores for the percent chance of seeing a grizzly bear were all above zero (average=0.40), suggesting that social norms for this variable are highly shared among visitors. At the same time, a moderately low norm intensity raises the question of whether this variable is a good indicator of quality for the visitor experience. Possibly the type of encounter (e.g., number of buses at wildlife stops, waiting time to see wildlife) is more important to visitors than the percent chance of encounter. Other characteristics of wildlife encounters, including proximity to the wildlife, sense of security while viewing, and the length of the view, could be considered in future studies seeking to develop standards for wildlife viewing.

5.0 CONCLUSIONS

Findings from these studies provide guidance about the range of conditions for wildlife viewing that would be acceptable to visitors at a well known national park in Alaska and a lesser-known wildlife refuge. Wildlife-viewing indicators and standards applied well at both locations. Four potential indicators of quality are identified that can be used to help define and manage wildlife-viewing opportunities. A range of potential standards of quality is developed for these indicator variables. Normative standards of visitors to the two study areas were found to be generally salient and moderately to highly crystallized. Respondent self-reports of existing conditions for these indicator variables provide a convenient and useful way to monitor the condition of indicator variables as called for by contemporary park and outdoor recreation management frameworks. Findings from the studies reported here suggest that visitors currently enjoy fairly high quality wildlife-viewing experiences.

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LEISURE AND HEALTH

AN APPLICATION OF THE GLOBAL SUSTAINABLE TOURISM CRITERIA IN HEALTH TOURISM

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Abstract.—Tourism is an important element of the global economy. Yet for the tourism industry to grow and prosper, there is a need to protect local environmental and social well-being. Sustainable tourism seeks a compromise between growth and protection. Today, health tourism is a multi-billion dollar industry tied to individuals' travel overseas for inexpensive and timely medical treatment that may or may not be available at home. This paper explores the health tourism phenomenon and examines the relative importance of sustainable tourism management practices to health tourists.

1.0 INTRODUCTION

For centuries, travel to foreign lands to soak in mineral waters has been popular. Today tourists may be seeking not only a bath, but also cosmetic surgery or a knee replacement. These travelers, called medical or health tourists, are joining one of the largest niches in the tourism industry. By one estimate, 750,000 Americans traveled abroad for medical care in 2007 and this number has the potential to increase to 6 million per year by 2010 (Deloitte Center for Health Solutions 2008). Every year, more and more countries promote health tourism. Given this tremendous growth, how might local people, officials, tourism promoters, and tourism managers maximize the social, economic, and environmental benefits of health-related tourism and minimize the negative impacts within the local host community? Is health tourism sustainable?

Mathieson and Wall (1982), Mieczkowski (1995), and Hall and Page (2006), among others, have noted that tourism in general has a variety of impacts—both positive and negative—on local communities so there is a need to promote sustainable practices specifically in the health tourism industry. Management practices that enhance the community by maximizing benefits and minimizing threats yet permit growth to meet future demands can be called *sustainable*.

Health tourism has at least two concerns when viewed in terms of sustainability (Bristow 2009). First is the concern that access to medical care in health tourism communities will be limited to wealthy foreigners who can afford to pay more than the local prevailing wages. While “outsourcing” is an accepted component in the global economy when, for example, someone from the United States is talking with a computer technician in Mumbai, the ethical implications are more complicated when it is, for example, a medical doctor's attention that is being outsourced (see Fig. 1). Further, since health tourism clinics are often private facilities, nearby public services may be strained beyond operational capacity to meet the needs of the indigenous population. Poorer local citizens are particularly threatened since private clinics are financially out of reach (George 2009).



Figure 1.—Political cartoon noting the outsourcing of medical doctors (Source: Zinnov, 2006).

Second, in a world where clean drinking water is still a luxury for millions, the proper disposal of medical waste is a major concern. Medical waste is one of the more hazardous types of waste and the improper disposal of syringes, blood, and other biohazards threatens local water supplies and the public health of nearby residents.

The main purpose of this research is to ascertain the relative importance of criteria for sustainable tourism to the health visitor. Given that hospitals are not traditionally in the tourism business (George 2009) but are now seeking to provide this service to their foreign patients, research into sustainable health tourism practices is timely. Costa Rica is selected as the case study since the country has a history of extensive ecotourism founded on a wealth of natural resources and protected park areas. Further, the country has a reputation for excellent healthcare facilities and two hospitals have recently achieved international accreditation.

2.0 BACKGROUND

Historically, wealthy individuals have traveled far to seek the therapeutic benefits of mineral waters, clean mountain air, and peaceful surroundings (Mitman 2003). While these practices continue today, patients are now seeking low-cost, prompt medical care that may or may not be available at home (Smith 2006, Turner 2007). For many uninsured or underinsured Americans, low-cost surgery overseas is a reasonable expense, even after adding travel and lodging costs. Beyond the cost savings and the advantage of not having to wait months or years for help, individuals have also crossed borders to seek medicines unapproved by the U.S. Food and Drug Administration (Urology Times 2008) and procedures such as sex-change operations (Connell 2006) that are not available at home due to laws or local customs.

Stepping up to meet this demand, numerous countries have expanded resources to attract health tourists. Hospitals and clinics are springing up next to international borders or in capital cities. Private hospitals can cater to international clients in addition to local wealthy citizens.

Hundreds of new health tourism brokerage firms link patients with clinics. These firms plan pre- and post-operative vacations in package deals; post-operative vacations are especially in demand by cosmetic surgery patients who wish to wait for the bandages to be removed and significant healing to occur before returning home to unsuspecting family and friends. To cater to this market, organizations like the Medical Tourism Association have piloted a program to certify medical tourism providers in a step toward formalizing and legitimizing the industry (Medical Tourism Association 2009).

Like the brokers, hospitals can seek accreditation. Costa Rica has two facilities that have gained international certification in the last two years: Hospital Cima (www.hospitalcima.com) and Hospital Clinica Biblica (www.clinicabiblica.com), both in San Jose. The Joint Commission International and the United Kingdom's Trent Accreditation Scheme are two of the organizations that conduct worldwide medical accreditation.

While accreditation may assure visitors of a high quality hospital visit, there are also potential problems. Smith and Puczko (2009) have noted that local tourism employees may not be trained to meet the specialized needs of health tourism patients. They also note that the health tourism industry may draw local workers away from the rest of the tourism businesses.

To evaluate the overall management of health tourism, sustainable tourism practices need to be assessed. From the numerous models for sustainable tourism, we selected for this study a model by the Partnership for Global Sustainable Tourism Criteria (GSTC). This partnership was formed by the Rainforest Alliance, the United Nations Environment Programme, the United Nations Foundation, and the United Nations World Tourism Organization in 2008. The partnership designed these criteria to be the minimum practices to insure sustainability for the tourism business and to protect local natural and cultural resources. Further, the criteria should seek to alleviate poverty (Global Sustainable Tourism Criteria 2008).

3.0 METHODS

To assess the importance of sustainable practices in health tourism, a survey was deployed to explore the role of health tourism in Costa Rica, a country better known as a premier ecotourist destination. The survey collected information about health tourists' socio-economic characteristics, where they traveled, what health-care procedures they sought, and how they assessed the sustainability of health tourism practices as proposed by The Partnership for Global Sustainable Tourism Criteria (2008). Specifically, respondents ranked the importance of criteria used to maximize social and economic benefits to the local community and minimize negative impacts.

With the intention of reaching a broad audience, a request to participate in the study was published on 5 December 2008 in the *Tico Times*, a weekly English-language newspaper published in Costa Rica. In addition, notices were posted on email distribution lists, related medical tourism blogs, and other electronic communications. The survey was open to all who were interested in the idea of health tourism, whether or not they had traveled abroad for medical treatment. Ninety-two individuals completed the survey. Some of the basic survey data are highlighted in this report. Additional information is available on our research website (<http://www.wsc.ma.edu/medicaltourism>).

4.0 RESULTS

Of the 92 respondents, 37 (40.2 percent) had traveled abroad for a medical procedure, 31 (33.6 percent) were thinking about doing so, and 24 (26.1 percent) had not traveled abroad and were not considering doing so. For those in the last category, only basic travel data and socio-economic information were collected; these data are presented in section 4.5 below. For the 68 who had traveled as health tourists or were considering doing so, the questionnaire next asked about issues related to the medical travel.

4.1 Health Tourism Countries

For health tourists, the decisionmaking process is complicated. Smith and Forgione (2008) suggest that most health tourists select a country first and then a hospital. Our research followed that model, asking

first about which country or countries the respondents had considered and then which hospital(s) or clinic(s). Respondents had considered an average of 1.5 countries with a range of one to eight countries. This low average might reflect confidence in or familiarity with the chosen destination so that other options were not considered. Thirty-four respondents (50 percent) had considered traveling to Costa Rica, followed by Mexico (25 percent, 17 respondents), India (18 percent, 12 respondents), Thailand (10 percent, 7 respondents), Panama (7 percent, 5 respondents), and Singapore (6 percent, 4 respondents). Turkey, Cuba, Argentina, Belgium, Brazil, Canada, Colombia, Guatemala, Malaysia, Hong Kong, Germany, Ukraine, and Venezuela had each been considered by three or fewer people.

Of those who had actually selected a country or countries to visit, 25 chose Costa Rica, 11 chose Mexico, and 6 chose India. One or two people had selected Canada, Turkey, Colombia, Cyprus, Guatemala, Hong Kong, Malaysia, or Singapore. Note that the survey was heavily marketed in Latin America and the numbers here reflect that.

4.2 Procedures Sought

Thirty-eight percent of the travelers (n=29) had sought or were considering seeking dental care. Mexico in particular has a history of and reputation for offering high-quality dental care with 40- to 80-percent cost savings compared to the United States (Judkins 2007). Cosmetic surgery abroad was considered or sought by 20 percent of the sample (n=15). The top destination for cosmetic surgery was Costa Rica, which has a reputation for high-quality cosmetic surgery (Castonguay and Brown (1993). Other listed treatments were eye care, orthopedic procedures, laparoscopic surgeries, and bariatric surgery. Several survey respondents had had multiple procedures abroad.

4.3 Factors Influencing Travel

Twenty-four survey respondents (34 percent) said that the media had influenced their decision to travel abroad (or consider traveling abroad) for medical care. The use of the Internet to "shop" for information about health tourism has taken much of the mystery out of foreign travel (Harvard Health Letter 2008). Recommendations

Table 1.—Importance of different factors health tourists

How important are these considerations in your decision? (5 point scale, 1 = not very important, 5 = very important)	Mean	Std. Deviation
Cost	4.56	0.76
Reputation of Medical Doctor	4.47	0.74
Reputation of Medical Facility	4.33	0.72
Post operation opportunities (recuperation)	3.83	1.03
Hospital is accredited	3.73	1.20
Climate (weather) of country	3.26	1.13
Facility is affiliated with American Hospital	3.10	1.40
Returning to home country	2.88	1.34
Procedure not available at home	2.34	1.20

from friends were the second most influential factor in considering health tourism. Travelers most often handled their own travel arrangements.

When asked about the importance of several factors in the decision to travel abroad for a medical procedure, cost ranked highest with an average score of 4.56 out of a possible 5.0 on a Likert scale ranging from not very important (1) to very important (5) (Table 1). The reputation of the medical doctor and the facility were also important to respondents and received scores of 4.47 and 4.33, respectively. Post-operation opportunities, hospital accreditation, local climate, and American hospital affiliation were less important and the scores for these factors varied among respondents. The least important factors on the list were “Returning to home country” and “Procedure not available at home.”

4.4 Evaluation of Sustainable Tourism Practices

To determine the importance of the sustainable tourism criteria, the respondents were asked to evaluate nine different criteria on a five-point Likert scale ranging from not very important (1) to very important (5). The nine criteria (see Table 2) were taken directly from The Partnership for Global Sustainable Tourism Criteria list (available online at www.sustainabletourismcriteria.org), specifically from section B, “Maximize social and economic benefits to the local community and minimize negative impacts.”

Of the nine listed criteria, the one that received the highest average score (3.72 out of 5.0) was “The international or national legal protection of employees is respected, and employees are paid a living wage.” This criterion was followed closely by: “The company has implemented a policy against commercial exploitation, particularly of children and adolescents, including sexual exploitation” (score of 3.67); “The company is equitable in hiring women and local minorities, including in management positions, while restraining child labor” (score of 3.64); and “The activities of the company do not jeopardize the provision of basic services, such as water, energy, or sanitation, to neighboring communities” (score of 3.63).

For respondents, the least important criterion in the list (although it still received an average score above “indifferent”) was “The company offers the means for local small entrepreneurs to develop and sell sustainable products that are based on the area’s nature, history, and culture.”

4.5 Travel Behavior and Socio-Demographics

Our sample tended to be world travelers, with 48 stating that they had visited Central America or the Caribbean for a vacation in the past 5 years. In addition, in the past 5 years, 28 respondents had traveled to Europe, 11 had been to destinations in North America, 10 had gone to Asia, Africa, or the Pacific area, and 4 had traveled to

Table 2.—Assessment of the global sustainable tourism criteria

How important are these considerations in your decision? (5 point scale, 1 = not very important, 5 = very important)	Mean	Std. Deviation
The international or national legal protection of employees is respected, and employees are paid a living wage.	3.72	1.14
The company has implemented a policy against commercial exploitation, particularly of children and adolescents, including sexual exploitation.	3.67	1.17
The activities of the company do not jeopardize the provision of basic services, such as water, energy, or sanitation, to neighboring communities.	3.64	1.14
The company is equitable in hiring women and local minorities, including in management positions, while restraining child labor.	3.63	1.13
The company actively supports initiatives for social and infrastructure community development including, among others, education, health, and sanitation.	3.42	1.28
Local residents are employed, including in management positions. Training is offered as necessary.	3.30	1.21
Local and fair-trade services and goods are purchased by the business, where available.	3.14	1.21
A code of conduct for activities in indigenous and local communities has been developed, with the consent of and in collaboration with the community.	3.14	1.18
The company offers the means for local small entrepreneurs to develop and sell sustainable products that are based on the area's nature, history, and culture.	3.02	1.33

South America. The respondents had traveled less often for business although 12 had taken business trips to Central America or the Caribbean, 9 had been to Asia or Africa, 5 had gone to Europe, 4 had traveled in North America, and 2 had been to South America. Despite economic concerns, 41 percent of respondents said that they were “very likely” or “somewhat likely” to vacation abroad in the next 12 months.

Almost half of the survey respondents did not answer the demographic questions but, of those who did, more than half were male and the vast majority were more than 40 years old. The most frequently reported annual household income category was \$25,000 to \$49,999. More than 50 percent of the group had completed at least some college. Of the 52 respondents who provided their employment status, 25 were working full time, 9 were working part time, and 16 were retired. Of the 51 who answered the question about marital status, 36 were married. Approximately half answered the question about the country of their birth. The vast majority were born in the United States.; other listed countries of birth included India (2 people), Germany (1 person), New Zealand (1), Poland (1), and Taiwan (1).

5.0 DISCUSSION

The survey data suggest that health tourists are cost-sensitive and care about the needs of local workers at health tourism destinations. Given this interest in supporting sustainable tourism, it is not too late to build sustainable practices into health tourism strategies. While the quality of patient care is important for health tourists, the local population should not receive substandard care at the same facilities. Human rights organizations often list “health” as one of the most important human rights. Dr. Margaret Chan, director general of the World Health Organization, asserts: “Our greatest concern must always rest with disadvantaged and vulnerable groups. These groups are often hidden, living in remote rural areas or shantytowns and having little political voice” (World Health Organization 2007, p. 1).

While the GSTC criteria about employing local residents were only moderately important to survey respondents, it is a real threat to local communities when a workforce is imported to work in the tourism industry. Imported workers compete with local employees and diminish tourism’s social and economic benefits in local communities (Smith and Puczko 2008).

Countries also need to be careful about expanding health tourism too quickly. For example, according to *The Travel and Tourism Competitiveness Report 2009* (Blanke and Chiesa 2009), Costa Rica has improved its overall ranking from 44th (out of 130 countries) in 2008 to 42nd (out of 133 countries) in 2009. But the report also notes there is room for improvement in the quality and availability of healthcare in Costa Rica; the country receives a 4.7 score out of a possible 7.0 for “health and hygiene.” In addition, Costa Rica is described as having a competitive advantage in the availability of hotel rooms and car rentals but a competitive disadvantage in the density of physicians (1.3 physicians per 1,000 residents) and of hospital beds (13 beds per 10,000 residents) (*The Travel and Tourism Competitiveness Report 2009*, p. 171). By comparison, the United States has 2.6 physicians per 1,000 residents and 32 hospital beds per 10,000 residents. Costa Rica may be well situated to expand general tourism but also needs to focus on the healthcare of its own citizens.

The Global Sustainable Tourism Criteria are a work in progress and industry organizations are reviewing the criteria. Changes and refinements can be expected as the criteria are applied around the world. Now is a good time for the health tourism industry to become a sustainable industry. George (2009) notes that this prospect is a challenge since hospitals are not necessarily attuned to—or accustomed to addressing—the needs of tourists. International hospital accreditation should have sustainability practices written into its standards. Then health tourism can be both profitable and sustainable.

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STEWARDSHIP, PARTNERSHIPS, AND STAKEHOLDERS

CONCEPTUALIZATION OF INTERACTIONS BETWEEN PARTNERS AND THE U.S. FOREST SERVICE

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Abstract.—Since the 1980s, U.S. Forest Service managers have faced reduced appropriations, constraining their capacity to manage recreation lands, facilities, and services. Downsizing and outsourcing continue as the “push for partnerships” persists in the administration of federal recreation lands. Despite this reliance on partnerships to meet targets, little is known about the nature of the interactions between Forest Service personnel and their partners. Twenty-one key informant interviews were conducted with Forest Service personnel and recreation partners, representing multiple regions, a range of management levels, a diversity of agency employees, and a variety of recreation work performed. Analysis revealed two main categories of interactions: institutional and relational. Key components of institutional interaction included duty, necessity, commitment, and effort; key components of relational interactions were interdependence, synergy, power, trust, connection, and communication. Better understanding of the institutional and relational interactions will help the agency develop, maintain, and evaluate recreation partnerships.

1.0 BACKGROUND

A “push for partnerships” in federal agencies began during the Reagan-era movement to downsize the federal government by reducing appropriations. For U.S. Forest Service land managers, this political movement has limited their capacity to manage recreation sites, facilities, and services. The agency continues to respond to these challenges by using recreation partnerships to stretch limited funding (e.g., the 1987 National Recreation Strategy), leverage additional funding (e.g., the 2000 Recreation Agenda), and provide

recreation services (e.g., the Forest Service Partnership Enhancement Act of 2005).

Despite the Forest Service’s long history of—and growing reliance on—working with partners to provide recreational opportunities, most partnership research focuses on collaborative planning and watershed management (Cousens et al. 2006, James 1999, Segil et al. 2003). Research on recreation partnerships has focused on stages of development (e.g., Darrow and Vaske 1995, Uhlik 1995) and effectiveness (e.g., James 1999, Selin and Chavez 1993). However, much of this research is based on case studies or anecdotal evidence (e.g., Mowen and Kersetter 2006) in varying specializations within recreation (Crompton 1999). Some contributors to the discussion on recreation partnerships have made pleas for study replication to better evaluate success (Uhlik and Parr 2005, Vaske et al. 1995), while others have suggested that preconditional variables should be determined first (Crompton 1999, Mowen and Kersetter 2006).

2.0 OBJECTIVES

This study is part of a larger, multi-phase research project in which a conceptual framework is being developed to better understand recreation partnerships within the Forest Service. Ultimately, this framework will be tested empirically to strengthen its utility to the agency, its partners, and other organizations that rely on partnerships. This framework will also contribute to the partnership knowledge base by refining the preconditional variables of partnerships and enabling replication across various agencies, organizations, and specializations. Specifically, the purpose of this study is to examine agency and partner conceptualizations of one component of the emerging framework: the interactions between the Forest Service and its recreation partners.

The definition of “partnerships” for this project is based on federal policy: “arrangements that are voluntary, mutually beneficial, and entered into for the purpose of mutually agreed upon objectives” (Outka-Perkins

Table 1.—Informant profiles

Informant Type	Number of Informants
Forest Service Informants	
Administrative Level	
Region	2
Forest	10
District	3
Region	
2	1
4	1
6	1
8	3
9	9
Position Title	
Partnership Coordinator	3
Supervisory Forester	1
Recreation Program Manager	6
Public (Customer) Services Team Leader (Staff Officer)	4
Trails Specialist	1
Partner Informants	
Partner Group Type	
Trail Association	3
‘Friends of’ Group	2
Contractor	1
Region	1
6	2
8	2
9	1
Multiple regions	

2009, p. 9). Following James’ (1999) recommendation, this study’s definition does not include collaborative planning groups because the needs of a partnership are “identifiable and readily understood” while collaborative groups do not have “a full understanding of the issues that generate the alliance” (p. 38).

3.0 METHODS

This multi-phase research project employs a grounded theory research approach (Strauss and Corbin 1998) to develop, refine, and test a conceptual framework of recreation partnerships within the Forest Service. This study reports findings from the first phase, in which key informant interviews were conducted

with 15 agency employees at multiple administrative levels, regions, and positions (Table 1). In addition, interviews were conducted with representatives from six partner groups that provide a variety of services to the agency. Semi-structured interview guides were used for regional partnership coordinators, forest and district-level personnel, and partner groups. Interviews were conducted both in person (n=16) and via telephone (n=5). All interviews were audio-recorded, transcribed verbatim, and coded for emerging constructs and relationships using constant comparison. Peer debriefing (Lincoln and Guba 1985) was employed to negotiate a shared understanding of the constructs and relationships and to model the conceptualizations. The second phase

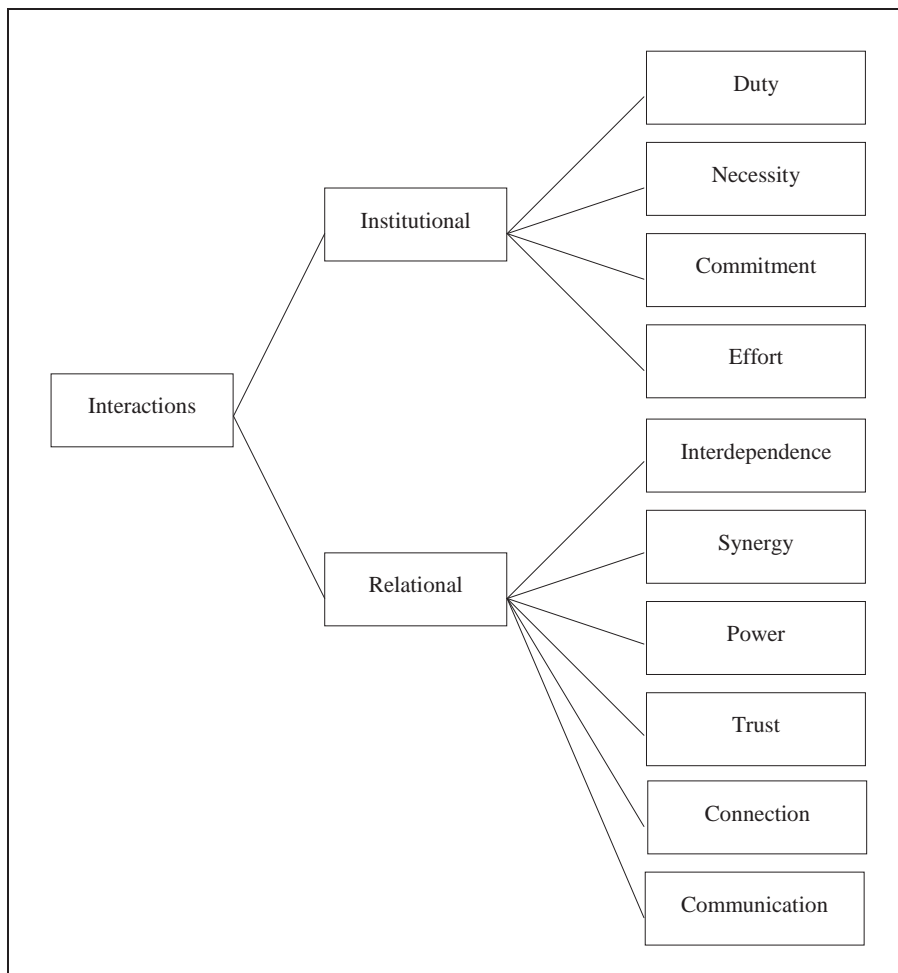


Figure 1.—Conceptual model of Forest Service-partner interactions.

of this project will explore and refine the conceptual framework using multiple case studies, and the third phase will test the framework with a national survey.

4.0 RESULTS

Analysis of the interview data identified two main categories, or levels, of constructs related to Forest Service-partner interactions: institutional and relational (Fig. 1). Institutional interactions consist of four constructs (i.e., duty, necessity, commitment, and effort) that describe both the reasons to partner and the requirements to engage in partnerships. Relational interactions consist of six constructs (i.e., interdependence, synergy, power, trust, connection, and communication) that describe the needs of both the agency and its partners to maintain informal or formal contracts. Each construct is discussed below, “grounded” in the voices of the informants.

4.1 Institutional Interactions

Forest Service personnel described engaging in partnerships as an agency **duty** with some partners expecting to be able to partner and others demanding that the agency work with them. These expectations and demands appear to be related to nearby communities’ and specific partner groups’ engagement in service. Additionally, the enthusiasm associated with public willingness to partner elicits feelings of guilt in agency employees because of the agency’s commitment to serving the public. These guilty feelings make it hard for Forest Service employees to turn away willing partners, even when the employees do not have time to commit to the partnership. For example, one informant explained that “often our partners really want more time and have more enthusiasm and are more interested in things than we plan time to respond to their needs... It’s not that we aren’t interested, it’s just that they might have an idea to

do something and we might think it's a great idea, but we don't have time to devote to it" (Forest-level employee, partnership coordinator).

Agency personnel also view partnerships as a **necessity** because partnering is essential to meeting the agency's mission and goals. Employees explained that it is harder to provide recreational services and opportunities because decreased appropriations (i.e., personnel and budgets) constrain agency capacity. This necessity is also apparent to partner organizations. For example, a trail association informant explained that "it used be that the Forest Service perceived these partners to be PR [public relations]. It was all about PR and getting your picture taken in the newspaper or getting a small write-up in the newsletter. It didn't really mean anything to anyone. Now some Forest Service managers recognize that volunteer partnerships are the only way to get work done." However, partner organizations are concerned about the agency's loss of capacity – particularly, loss of technical knowledge and skills – because it limits the Forest Service's ability to truly partner and forces decisionmakers to focus more on outsourcing.

The **effort** required to partner can also be overwhelming to agency personnel. It is challenging to solicit and build new partnerships because the time and energy required to coordinate and nurture existing partnerships are substantial. A regional partnership coordinator explained the challenge by stating, "[it's] probably the fact that they are overwhelmed with what they are doing [agency tasks] and even if they had a party walk in the door today to help them do a task, they don't have the time and energy to put into it. Forest Service people don't have the time and energy to put into developing a partner to a point where the partner can be productive." Additionally, agency policies also require substantial time and energy. Navigating the red tape associated with administrative paperwork and required trainings, as well as ensuring compliance with agency work standards, requires substantial effort on behalf of agency personnel.

Although there is an "acknowledgment" of the need for partnerships by upper administration, participants perceived that there continues to be limited **commitment** to the resources (e.g., personnel) and recognition

(e.g., reporting) needed for partnerships. Oftentimes, dedicated employees act outside of their job descriptions to develop partnerships because these local-level leaders are committed to public service and building community relations. At the same time, agency employees are concerned that partners may not follow through with their commitments, leading to lost opportunities with other partners or failure to accomplish certain tasks. This concern about commitment is also expressed by people from partner organizations like this trail association informant:

I think the important thing to reiterate is the notion of leadership. It's not in the public's interest for our organization to be in a leadership position on trail maintenance. We could take that on, but it's not in the interest of the public for us to decide what trails to maintain. We need leadership in the agency. What's happening is that it's like a vacuum in the Forest Service. It's all hollowed out. We are at a stalemate. We are waiting to see where the agency will go. But I don't think we want a bottom-up approach here, with organizations like ours leading from the bottom up. It would be total anarchy. We need to meet in the middle. We need some commitment, some match, a certain level of commitment. We need to know that the lights are on over there.

As this informant implies, agency commitment, as well as commitment by partner groups, reduces feelings of uncertainty.

4.2 Relational Interactions

Forest Service employees view partnerships as **interdependent** relationships. Both partners and agency personnel must contribute effort and provide inputs (e.g., physical and financial resources, and personnel time) for the relationship to have mutual benefits. Mutual benefit implies having a common interest to accomplish a specific task, as well as having shared goals. However, shared goals tend to be less apparent than common interest, as explained by a forest-level recreation manager:

It was one of those things where our goals and their goals are not exactly the same, but certainly there are

areas where they coincided and we really hammered [that point] hard. Experience taught me that one thing the Forest Service is sometimes guilty of is thinking that partners are here to help us get our jobs done and actually partners are here so we can help them get their jobs done... I think as long as we realize that and find some areas of mutual interest, we can be very successful as we were with them.

Over time, and when relationships have this interdependence, the relationship has **synergy**. For example, a forest-level partnership coordinator explained, “some partnerships have been with us [for so long] we just take it for granted almost that [districts] have partners. Sometimes we do it so naturally that we forget that it’s something actually special.” This increased flow creates greater outcomes (i.e., accomplishing more tasks) by smoothing relationships and allowing greater access to partnership networks. However, the agency must remember to balance partner priorities and agency goals.

Another aspect of relational interactions is **power**, specifically the loss of agency control over the process and outcome that comes with shared decisionmaking about a task. Leadership is needed to keep things on track, as highlighted by a forest-level public relations staff officer:

Well, the only challenge we faced in that work project is that there was too many chiefs. In hindsight, when we talked to the staff that organized the workday, they could have done something that would have minimized that whole problem. They did not anticipate it. They did not think about it ahead of time, so we learned a little bit more about volunteer management.

Although strong leadership in both the agency and the partner group can help overcome some power issues, the process is a juggling act. The ideal is to share authority and control but maintain the ability to rework the partnership terms when expectations are not met.

Trust is another factor in relational interactions. Trust is a concern for both agency personnel and their partners, and trust can be hindered by too much ownership of a project. From the Forest Service perspective, partners

with too much ownership may feel they have the liberty to conduct unauthorized work; conversely, agency personnel with too much ownership may have limited vision of how and when to use partners. A trail association partner provided this example:

We had to convince them [the Forest Service] that they didn’t have to come out and monitor us. To them, volunteers were people who didn’t show up; you couldn’t rely on them... It took a while for them to realize that we were serious, that we would show up ... that we would do a good job. Our crew leaders had to break them in to recognize the value of volunteers. It was about building trust and showing them that we are an organized, skilled workforce.

Building such trust is easier with formal organizations that provide satisfactory training to their members and have demonstrated organizational commitment over time. Another concern related to trust is abuse, particularly when a financial exchange occurs (e.g., subcontracting work is awarded to a partner organization) or when goals change after the partnership agreement is made.

Not surprisingly, the **connections** that develop from partnerships are a component of relational interactions. Cultivating relationships is sometimes more important than accomplishing tasks; this process involves viewing partners as equals or work companions. Leadership (by agency employees who are willing to commit the time and energy) cultivates these connections. Agency champions tend to develop strong connections with their partners, creating additional support for recreation, a district, a forest, or the agency by establishing external champions (i.e., individual partners). When explaining how a trail volunteer and a recreation technician developed a connection that led to the formation of a trail association, the technician explained, “...and he’s been with me for 10 years now. If it wasn’t for him, there would be no trail.” The trail association founder replied, “...and if it wasn’t for this guy, I wouldn’t have started the association because his support has been phenomenal.”

These relational interactions enable the Forest Service to access needed skills and workforces. Yet, these relational interactions require both formal (e.g., meetings, financial exchanges, task orders) and informal (e.g., day-to-day interactions about progress and needs) **communication** between agency personnel and partners. Explicit communication allows for transparency (i.e., clear expectations and roles), but requires open, two-way communication between the agency and its partners and multi-level communication within the agency and within partner organizations.

5.0 CONCLUSIONS

Understanding Forest Service–partner interactions is important because it enables better assessments of the skills and responsibilities required of the agency and its personnel. For example, the agency needs to make more formal institutional commitments (e.g., dedicate more staff positions) to partnerships so that connections are not lost when employee turnover occurs. Relationally, the agency needs to provide feedback to its partners by evaluating work and determining the value of the partnership, which in turn will build trust. Though limited in scope, these implications illustrate the need for a conceptual framework that enhances our understanding of recreation partnerships as an institutional mechanism to meet the agency’s mission and accomplish tasks. Once refined and tested, this emerging framework will help the Forest Service secure funding to promote and support recreation partnerships, and will help the agency strengthen its partnership interactions.

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EXPLORING ELEMENTS THAT INFLUENCE STEWARDSHIP IN THE EASTERN LAKE ONTARIO DUNE AND WETLAND AREA

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Abstract.—The Eastern Lake Ontario Dune and Wetland Area (ELODWA) is a 17-mile stretch of sand dunes, wetlands, and woodlands along the eastern shore of Lake Ontario in New York State. Reductions in negative, visitor-caused impacts on the dunes (e.g., trampling of dune vegetation and sand erosion) are thought to be due in part to the extensive visitor education efforts of government agencies and non-governmental organizations. This study seeks to identify the elements influencing the development of a stewardship ethic in ELODWA users via 60 in-person qualitative interviews. Interview data revealed that both on-site management actions and socialized elements (e.g., upbringing) influenced the stewardship actions of visitors. Recommendations based on the analysis include diversifying on-site management and communicating a consistent stewardship message over time.

1.0 INTRODUCTION

Many researchers have studied the influence of educational efforts on managing visitor behaviors in natural settings over the past 25 years (McAvoy and Dustin 1983, Vander Stoep and Gramann 1987, Duncan and Martin 2002, Kuehn and Thompson 2007). The Eastern Lake Ontario Dune and Wetland Area (ELODWA) is a 17-mile stretch of sand dunes, wetlands, and woodlands located in north-central New York State. At the ELODWA, extensive visitor education efforts by government agencies and non-governmental organizations in the area may be partially responsible for reductions in negative, visitor-caused impacts on the dunes (e.g., trampling of dune vegetation and sand erosion) (Kuehn and Habig 2005, Kuehn and Thompson 2007). The strong stewardship ethic of many ELODWA visitors and local residents is of interest to agencies and

organizations like the New York State Department of Environmental Conservation, New York State Office of Parks, Recreation and Historic Preservation, New York Sea Grant, and The Nature Conservancy. Natural resource stewardship, defined as “making conscious decisions to act responsibly towards our environment” (Fisheries and Oceans Canada 2009), may play an important role in encouraging protective behaviors by resource users during their visits to natural areas. If understood, the elements influencing the development of this stewardship ethic in ELODWA users could be used to foster similar stewardship values in users of other natural areas.

While a stewardship ethic has an important role in visitors’ careful use of natural resources, the existing knowledge base about what influences the development of stewardship values and behaviors in users is extremely limited. The purpose of this study is to identify management strategies that encourage ELODWA users’ stewardship of natural resources. To accomplish this goal, we conducted 60 interviews during the summer of 2008 to identify stewardship-related actions, the factors influencing stewardship in both resident and nonresident male and female ELODWA users, and whether a stewardship ethic develops immediately or over time. The results and management implications of this study are discussed below.

2.0 METHODS

We conducted 60 in-person interviews with local residents and nonresidents in the ELODWA during summer 2008. We established a stratified random sampling framework to sample visitors by location (five areas providing public access within the ELODWA), day of week, time of day (morning, early afternoon, late afternoon), gender, perceived age (i.e., 18-40, 41-60, 61+ years), and proximity of residence to ELODWA area (residents were defined as those living within 20 miles of the ELODWA, while nonresidents were defined as those living 21 miles or more away). We developed a stratified sampling framework for randomly chosen days

Table 1.—Stewardship-related actions mentioned by respondents (n = 60)

Code	Resident		Visitor		Total
	Male	Female	Male	Female	
Stayed off dunes	12	13	5	9	39
Practiced carry in-carry out or 'leave no trace'	5	5	3	7	20
Picked up litter (of others)	4	2	5	5	16
Stayed on designated trails	2	2	2	2	8
Asked others to stay off dunes	3	2	2	1	8
Left/piled driftwood on the beach	0	1	2	2	5
Planted beach grass	2	1	0	0	3
Installed snowfencing on personal property	1	1	0	0	2
Built dune walkover on personal property	0	1	0	0	1
Assisted with organized events (e.g., beach clean-ups)	0	0	0	1	1

during summer 2008. On interview days, the interviewer requested an interview from the first visitor encountered who seemed to meet the sampling criteria for gender and age during the specified time of day. The interviewer first asked, "How many miles do you live from this area?" and used the response to determine whether the individual fit the resident/nonresident criterion for that day. If the individual did not fit the criterion, the interviewer proceeded to find another interviewee.

The interviewer used an interview guide and short demographic questionnaire for all interviews. Interviews lasted 15 to 20 minutes, were recorded (with interviewee permission), and transcribed. We examined the data (using qualitative analysis methods) for stewardship actions, elements influencing stewardship-related actions, and whether a stewardship ethic developed immediately or over time. We also analyzed data for patterns to identify themes, subthemes, and concepts (Taylor and Bogdan 1998); we used codes to name each. We then summarized results by the number of male and female residents and nonresidents describing each of the codes.

3.0 RESULTS

3.1 Demographics

The average age of responding ELODWA users was 42 years with a range of 18 to 72 years. Due to the sampling framework utilized, 50 percent (30 individuals) of the interviewees were male. In addition, half of the interviewees resided within 20 miles of the area they were visiting (15 male and 15 female residents) while

the other half resided more than 20 miles from the area they were visiting (15 male and 15 female nonresidents). Respondents had an average of 15 years of education (12 years of high school plus 3 years of college or vocational training on average). All residents and 90 percent of the nonresidents were repeat visitors.

3.2 Participation in Recreational Activities

Users participated in diverse recreational activities during their visit, including swimming (35 interviewees), sunbathing/relaxing on the beach (31), walking on the beach or a trail (23), playing ball/Frisbee on the beach (16), picnicking (13), socializing (9), and boating (8).

3.3 Themes, Subthemes, and Concepts

Qualitative analysis of the data explored three themes: stewardship actions, elements influencing stewardship actions, and stewardship development. The subthemes and/or concepts related to each theme are discussed below.

3.3.1 Stewardship actions

Two questions were asked to identify stewardship actions: (1) "Is there any action that you've done today that you think helps protect the dunes from erosion?" and (2) "Is there any action that you've done in the past that you think helps protect the dunes from erosion?" The concepts (i.e., actions) mentioned by respondents are shown in Table 1. Nearly two-thirds of all interviewees mentioned staying off the dunes; practicing carry in/carry out, picking up others' litter, staying on designated

trails, and asking others to stay off the dunes were also mentioned often. A greater number of residents (25) than nonresidents (14) mentioned that they stayed off the dunes (the message communicated through interpretation in the area), while equivalent numbers of residents and nonresidents (10 individuals each) mentioned practicing carry-in/carry-out (an action not included in ELODWA interpretation). One male interviewee indicated that he carried out both of these actions during his visits.

#30 (male resident): Well, I always pick up my trash. I don't litter around or go over the fences, or mess with the sand dunes. Just look at them.

3.3.2 Elements influencing stewardship

Interviewees were asked to explain what had caused them to take the stewardship action(s) that they had mentioned. They identified 54 different concepts that were grouped during the analysis into 11 subthemes. Table 2 shows all subthemes and 21 concepts (related to each subtheme) mentioned by five or more interviewees. The subthemes of "personal beliefs concerning protecting the dune resource," "educational elements," and "appreciation for natural resources" were mentioned by 52, 44, and 38 of the interviewees, respectively, as influencing their stewardship actions.

Four concepts were related to protecting the dune resource in the subtheme of personal beliefs. Two-thirds of the interviewees mentioned that dune protection is important in general (no specific reason for this importance was given). One male resident explained his belief that human intervention is needed to protect the dune ecosystem.

#11 (male resident): I think it's [i.e., dune protection] important. I think mother nature plays a major role in that. I think there needs to be some human intervention. To what degree, I think we got to...it seems that natural dunes aren't getting enough protection.

For the subtheme of educational elements, 13 separate concepts were identified, 6 of which were mentioned by five or more interviewees. Nearly half of the interviewees mentioned the influence of ELODWA signage that

communicates stewardship actions. The small interpretive signs placed along the beach in front of the dunes were mentioned most often. The following interviewee was able to paraphrase the message on these small signs.

#16 (male resident): I read, like, the signs and that. You know, there's signs that just say, "Dunes are fragile, keep off them."

Interviewees also mentioned discussions with dune stewards (i.e., hired staff that educate visitors about dune erosion and protection); brochures, guidebooks, and articles about dune protection; and discussions about dune protection with unspecified people. Signage was mentioned more often than these other educational mechanisms, probably because of its constant presence in the ELODWA. The dune stewards (who work 7-hour days, 5 days a week) and publications (available only through specific distribution points) are not as consistently available as the signs. However, while interviewees indicated that signage was their most widely used form of interpretation, several interviewees used alternate forms of interpretation instead, suggesting that different forms of interpretation may be necessary to accommodate different visitor educational preferences.

In the appreciation for natural resources subtheme, eight concepts were mentioned by five or more interviewees. Two concepts were each mentioned by nearly one-quarter of the interviewees: "doing the 'right thing' for the resource" and "keeping the resource the way it is ('natural')." The following two quotes express these two concepts.

#3 (male visitor): [Picking up litter]'s the right thing to do.

#42 (female visitor): "There's so much in the environment that's being taken away, and this is one of the natural beauties that I just think it's important to keep it the way it was intended to be..."

Other subthemes mentioned by 10 or more interviewees included "physical on-site influences," "observations of change in the resource," "socialization," "personal/family benefit" of the dunes, and "personal investment of

Table 2.—Elements influencing stewardship development. All subthemes mentioned are included; only those concepts mentioned by five or more interviewees are included (n = 60)

Subtheme	Concepts	Resident		Visitor		Total
		Male	Female	Male	Female	
Personal beliefs concerning protecting the dune resource		12	14	13	13	52
	Dune protection is important in general	12	10	9	10	41
	Dune protection is important to maintain sand on the beach	0	4	3	2	9
	It is important to protect the dunes for people	2	2	0	1	5
Educational elements		13	11	11	9	44
	ELODWA interpretive signs	9	6	5	8	28
	Discussions with dune stewards	4	2	5	2	13
	Media (brochures, guidebook, articles)	1	6	3	0	10
	Discussions about dune protection with unspecified people	3	2	1	4	10
	Sharing knowledge/ discussions with family	1	2	2	2	7
	Education in general (media)	1	3	0	1	5
Appreciation for natural resources		11	9	7	11	38
	Doing the “right thing” for the resource	0	3	4	6	13
	Keeping the resource the way it is (“natural”)	4	4	1	4	13
	Don’t want to lose resource	5	2	2	2	11
	Don’t like litter on beach	4	2	1	2	9
	Respecting resources in general	4	0	1	2	7
	Perception that the resource is unique	2	1	1	3	7
	Having respect for this resource	3	1	1	1	6
	The resource is pretty/beautiful	1	1	1	2	5
Physical on-site elements		4	2	3	5	14
	Designated routes (string fencing, walkovers)	2	2	2	4	10
Observations of change in resource		3	3	4	3	13
	Observing degradation over time (in past)	3	3	2	3	11
Socialization		3	3	2	4	12
	It’s the way I was brought up	0	2	2	2	6
Personal/family benefit		2	2	4	2	10
Personal investment time/ finances		2	2	3	3	10
	Involvement in a nongovernmental organization	2	1	3	3	9
Regulatory influences		2	0	0	2	4
Benefits for society		2	0	0	2	4
Knowledge of resource		1	0	2	0	3

time/finances” in dune protection. The most frequently mentioned physical on-site influence was designated trails and walkways. One female nonresident indicated that string fencing, a psychological barrier used throughout the ELODWA, influenced her decision to stay out of the dunes.

#45 (female visitor): I stay on the little paths that they rope off and stuff like that.

Interviewees frequently mentioned that observing the past degradation of the dune system and its restoration over the past 20 years had influenced their actions in the ELODWA. One female resident described some of the changes that she has observed in the ecosystem.

#22 (female resident): “I came here when I was a little girl and there are no dunes like they used to be. They used to be 40 feet in the air and everything. And just the erosion, the wind, and people trampling over them has all worn them down. And that’s [staying off the dunes] what’s gonna keep it that the pond stays the pond [in other words, that’s what will prevent sand from infiltrating the pond behind the dunes].”

Socialization related to a natural-resource protective ethic was also identified as influencing stewardship actions. The concept of “it’s the way I was brought up” was mentioned by six interviewees, and is summarized by the following quote.

#43 (female resident): I think when I was little, my mom and dad had said not to do that, and then I just didn’t have any interest in climbing them and touching them [i.e., the dunes].

Ten interviewees mentioned the benefit of the dune system for the interviewee and/or his/her family in general. They indicated that the use of the area by their children and grandchildren, or themselves, influenced their desire to protect the area.

Ten participants also mentioned personal investment of time or financial resources for dune restoration. Nine interviewees specifically referred to their involvement in a

nongovernmental organization related to natural resource management or protection in general.

#22 (female resident): I’ve been to the meeting for the new water thing that they’re having for the lake levels and all of that; I’ve been to that meeting. I try to get involved in the town of Sandy Creek because that’s the town that this is in...to see what’s going on. I belong to the sportsmen’s club. I haven’t joined the people for the bird sanctuaries, and actually taking care of the dunes but... Now I’m retired and I’m up here full-time so...we’ll see what next year brings. I like to get involved!

Fewer than 10 interviewees mentioned three subthemes: regulatory influences, benefits of the resource for society, and knowledge of the resource base. Regulations and the enforcement of regulations concerning dune use were mentioned by only four interviewees, as were benefits of the resource for society in general (e.g., benefits for future generations in general were mentioned). Knowledge of the resource base included concepts related to an in-depth understanding of flora and fauna on-site or of the process of dune erosion.

3.3.3 Stewardship development over time

Interviewees were asked “Did you feel that protecting the dunes from erosion was important during your first visit, or is it something that developed over time?” Two subthemes emerged through analysis. More than half (31) of the interviewees mentioned the first subtheme, “incremental changes in perceptions about stewardship over time.” One male nonresident described the stewardship ethic that developed in him through the interpretive signs’ consistent message:

#26 (male visitor): It basically developed over time. Seeing a sign every time and staying off it [i.e., the dunes].

Many interviewees also indicated that their protective ethic had developed as they aged.

#43 (female resident): Developed over time. I didn’t really have a sense in that when I was younger.

Eight other interviewees explained that their stewardship-related behaviors occurred immediately due to on-site signage and physical structures. One male resident explained how the interpretive signs encouraged his adherence to stewardship practices during his first visit to the ELODWA.

#59 (male resident): "When I first came here, I read like the signs and stuff, but ... I didn't really know exactly what it was out here, but I tend to honor that, you know. That's what you gotta do."

It appears that education media encourage establishment of a stewardship ethic during initial visits, and that the consistent use of management messages strengthens this stewardship ethic in follow-up visits.

4.0 DISCUSSION AND CONCLUSION

The objectives of this study were to identify stewardship-related actions, identify the elements influencing stewardship in ELODWA users, and understand how stewardship develops over time. Interviewees mentioned 10 distinct stewardship actions that they perceived as preventing dune erosion. Five or more interviewees used five of these actions in the ELODWA. Staying off the dunes was mentioned by nearly half of the interviewees, probably because of the extensive signage in the area that communicates the "Dunes are fragile – please stay off" message. Carrying out litter also was mentioned frequently, even though litter itself has little impact on dune erosion and litter removal is not mentioned in any of the interpretive media used in the ELODWA. This concept apparently is an important part of many interviewees' beliefs about resource protection. It seems likely that stewardship actions within the ELODWA are encouraged both by on-site management and by behaviors (such as not littering) encouraged in areas outside of the ELODWA.

While interviewees identified diverse elements that influence their stewardship actions, they most frequently mentioned personal beliefs concerning natural resource protection, natural resource appreciation, and educational influences. Such personal beliefs are likely to be reinforced over time through positive experiences in natural areas such as the ELODWA, educational

programs sponsored by schools and organizations, and socialization. Educational influences such as signs, brochures, and conversations with dune stewards are likely to influence visitors' actions immediately and strengthen the stewardship ethic in visitors over time. While most interviewees indicated that their stewardship ethic had developed over time, some reported participating in stewardship actions during their first visit because of on-site educational media and physical structures.

While it may be difficult for managers to influence the socialized development of a stewardship ethic in visitors, this research suggests that it is possible for managers to influence on-site stewardship actions. On-site educational efforts such as signage, roving interpretation provided by the dune stewards, and brochures appear to be highly effective at influencing stewardship in ELODWA visitors. While on-site media may be essential for encouraging stewardship actions by first-time users, providing a consistent message over the long term (nearly 20 years in the case of the ELODWA) appears to be an effective means of encouraging a long-term stewardship ethic in visitors. Combining different educational media (e.g., signs, brochures, and roving interpretation) also appears to be important, since not all interviewees used only one type. While many interviewees mentioned the small interpretive signs, others used brochures or information presented by the dune stewards instead. Using diverse media is likely to accommodate the varied interests and educational preferences of visitors, thus influencing a greater number of visitors than a single type of media alone.

The use of physical structures (such as dune walkovers and string-fenced trails) also appears to be important for on-site management. Although physical structures were mentioned by a moderately low number of interviewees (14 individuals), combining the use of physical structures with educational media seems to strengthen the effectiveness of each. While the educational media explain to visitors why dune protection is important, the physical structures support the educational message by directing and limiting access to the dunes. Regulations (mentioned by only four interviewees) appear to be only slightly influential, which is not surprising given the limited enforcement of regulations in the area.

In summary, this study explored the stewardship actions, elements influencing stewardship, and whether stewardship development occurred immediately or over time among resident and nonresident ELODWA users. The results indicate that actions such as staying off the dunes and picking up litter are common, and appear to be influenced both by on-site educational messages and socialized, offsite elements. On-site elements (e.g., physical structures and educational media) influence visitors' actions during initial visits to the ELODWA, while the constant presence of educational materials on-site strengthens the stewardship ethic over time. Repeat visitation and exposure to interpretive messages also appear to influence reinforcement of a stewardship ethic, as noted by differences in stewardship actions taken by residents and nonresidents. The diversity of management strategies in the ELODWA appears to be successful in addressing the different interests and educational preferences of a range of visitors.

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OUTDOOR RECREATION I

REPOSITIONING IDENTITY IN CONCEPTUALIZATIONS OF HUMAN-PLACE BONDING

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Abstract.—In this investigation, we adapted identity theory to reassess place attachment, a multidimensional concept with cognitive, affective, and conative elements. We hypothesized that the cognitive component—place identity—is an antecedent of the affective and conative facets of place attachment. We empirically tested this reconceptualization using data from a wildland-urban interface survey conducted in San Diego ($n = 729$) and Los Angeles ($n = 929$), CA. Analyses of both data sets provided strong support for our reconceptualization of the place attachment construct and its associated measures. We suggest that identification processes are a driver of other affective and conative elements of place attachment, rather than existing on the same temporal plane.

1.0 INTRODUCTION

Scholars in several fields use the construct of place attachment to describe the phenomenon of human-place bonding. Their work shows that through interaction a place can become important to a person as an object of attachment. Place attachment often emerges as a person endows a space with meaning and value (Relph 1976, Milligan 1998). Most conceptualizations of place attachment broadly consider the construct a multidimensional phenomenon consisting of cognitive, affective, and conative elements (Low and Altman 1992, Jorgensen and Stedman 2001). The affective element refers to emotional attachments to place whereas the cognitive element is generally conceptualized in terms of place identity that links the physical environment to

self-conceptualizations (Kyle et al. 2004). The conative element is operationalized in terms of two dimensions: place dependence and social bonding (Kyle et al. 2004). Place dependence indicates how well a setting serves goal achievement given an existing range of alternatives. Social bonding refers to the social bonds that people share and associate with a specific place. Identity theory in social psychology suggests that the cognitive component (place identity) is central to the meanings and sentiments people ascribe to places and to conative actions in spatial contexts.

In social psychology, the central premise of identity theory is that identity is a primary motivator of individual behavior (Stryker and Serpe 1982; Burke 1989a, 1989b; Burke and Reitzes 1991; Stets and Burke 1996, Stets 1997). Since identity comprises a set of meanings defining who one is, this set of meanings serves as a standard or reference for a person in her or his evaluations of behavioral choices (Stets and Burke 2003). The work of Burke and his associates (Burke et al. 1988; Burke 1989a, 1989b, 2003) illustrates that a person acts in a self-regulatory manner with the goal of achieving consistency between the meanings associated with one's identity and meanings of the self in any given situation. Identities are "verified" when the self-in-situation meanings match the meanings held in the identity (i.e., self-verification).

Identity theorists have noted that self-verification arouses positive emotions and sentiment (Smith-Lovin 1995, Burke and Stets 1999, Stets and Tsushima 1999). For instance, Burke and Stets' (1999) longitudinal study of married couples showed that the confirmation of spousal identity produced positive self-feelings (e.g., competence, self-esteem, happiness, and satisfaction). The strength of an emotion is a function of how important an identity is; more important identities generate stronger emotion (Stryker 1987; Burke 1991, 1996; Burke and Stets 1999; Stets 2003). Thus, in the context of place attachment, places central to an individual's sense of self are more likely to be endowed with value and sentiment.

Individuals participate actively in the self-verification process (Sampson 1978, Leary et al. 1986, Burke and Reitzes 1991). People learn which behaviors help them achieve congruence between identity and meanings of the self in a situation (Burke and Reitzes 1991). People develop and stabilize patterns of actions (in leisure or work) and group relations (with friends and family) that repetitively verify their identity. In this way, the contexts and spatial settings that facilitate such behaviors and social ties are valued to the extent that individuals are committed to their identities. The verification of place identities evolves through place interaction, often in the context of activity-specific behaviors and in the presence of significant others. These interactions further affirm individual ties to place.

Based on this literature, we hypothesized that place identity (the cognitive component) is an antecedent of the other (affective and conative) facets of place attachment.

2.0 METHODS

2.1 Data Collection

For this investigation, we used data from a larger study of the public's perceptions of wildfire management in the wildland-urban interface near the Cleveland, Angeles, and Los Padres National Forests (NF) near Los Angeles and San Diego in southern California. We began by using ArcGIS (ESRI, Redlands, CA) to create half-mile buffers around each NF and selecting census tracts that intersect with the buffers. We then selected names and address of residents ($N = 4,564$) in the target census blocks from lists provided by a commercial research company. We aimed to get a mix of residents whose homes varied in proximity to the wildland-urban interface and whose communities varied in how recently they had experienced a wildland fire event. A modified Dillman (2000) procedure was used with four contacts: (1) initial introductory letter explaining the purpose of the investigation and drawing respondents' attention to the survey instrument that would be arriving in the coming weeks; (2) cover letter, survey, and return postage-paid envelope; (3) a postcard reminder; and (4) a second cover letter, survey, and return postage-paid envelope sent to nonrespondents. This sampling

procedure yielded 1,653 completed surveys for a 36.2 percent response rate.

2.2 Measures

Place attachment was measured using items adapted from Kyle et al.'s (2004) place attachment scales. The 11 items measured four dimensions: *place identity*, *affective attachment*, *place dependence*, and *social bonding*.

3.0 RESULTS

3.1. Sample Characteristics

Respondents were divided into two groups: people from the Los Angeles area and people from the San Diego area. The socio-demographic profile of respondents is in Table 1. For both groups, respondents were mostly white (San Diego = 91 percent; Los Angeles = 87 percent), older (San Diego and Los Angeles = average 61 years old), and male (San Diego = 61 percent; Los Angeles = 68 percent). They were generally well-educated (San Diego = average 15 years of education; Los Angeles = average 16 years), with annual household incomes in excess of \$60,000 (San Diego = 61 percent; Los Angeles = 68 percent).

3.2. Model Testing

Our analyses tested the measurement properties of the place attachment scale in addition to our hypothesized structure (i.e., place identification processes that drive other affective and conative outcomes). We tested both the scale's measurement properties and structural relations using data drawn from the two spatial contexts. Our model-testing procedure began with an examination of the measurement model (confirmatory factor analysis in LISREL version 8.5 [Scientific Software International, Inc., Lincolnwood, IL]), which examined the suitability of our hypothesized factor structure for these data. For both groups, the fit indices (San Diego, $\chi^2 = 177.77$, $df = 36$, RMSEA = .071, NNFI = .984, CFI = .989; Los Angeles, $\chi^2 = 197.17$, $df = 36$, RMSEA = .069, NNFI = .984, CFI = .990) for the model and the tests of internal consistency (all $\alpha \approx .70$)¹ indicated that the model satisfactorily fit the data (see Table 2). Following

¹Nunnally (1978) suggests that Cronbach's alpha coefficients equal to or greater than 0.70 are acceptable.

Table 1.—Sample demographics

Indicator	San Diego (<i>n</i> = 729)	Los Angeles (<i>n</i> = 929)
Gender <i>n</i> (%)		
Male	445 (61.0)	627 (67.5)
Female	275 (37.7)	291 (31.3)
Age (<i>M</i> years, <i>SD</i>)	61.4 (13.47)	61.8 (13.5)
Education (<i>M</i> years, <i>SD</i>)	15.4 (2.64)	16.3 (2.7)
Income <i>n</i> (%)		
Under \$20,000	24 (3.3)	35 (3.8)
\$20,000 - \$59,999	176 (24.2)	178 (19.1)
\$60,000 - \$99,999	186 (25.5)	230 (24.7)
\$100,000 - \$139,999	139 (19.1)	166 (17.9)
\$140,000 - 179,000	62 (8.5)	113 (12.2)
\$180,000 or more	60 (8.2)	122 (13.1)
Race/Ethnicity		
Hispanic	19 (2.6)	49 (5.3)
White	662 (90.8)	808 (87.0)
Asian American	3 (.4)	19 (2.0)
Black or African American	2 (.3)	13 (1.4)
Native Hawaiian or other Pacific Islander	21 (2.9)	12 (1.3)
American Indian or Alaskan Native	2 (.3)	2 (.2)

the establishment of a valid measurement model, we then tested the structural model (Anderson and Gerbing 1982). The final model indicated satisfactory model fit (San Diego, $\chi^2 = 177.77$, *df* = 36, RMSEA = .071, NNFI = .984, CFI = .989; Los Angeles, $\chi^2 = 197.17$, *df* = 36, RMSEA = .069, NNFI = .984, CFI = .990) (see Table 3).

Bollen (1989) referred to the procedure we used for model comparison across the two groups as invariance testing. Bollen (1989) also noted that testing for model comparability across groups is a matter of degree in that the researcher decides which parameters should be tested for equality across groups and in what order these tests should be made. The hierarchy of invariance² employed in this study involved the testing of increasingly restrictive hypotheses concerning equality between the two samples in terms of:

H₁: equality of structure - examines the suitability of a four-factor solution across the two groups;

H₂: equality of scaling - examines the similarity in the pattern of factor loadings among the groups; and

H₃: equality of structural coefficient estimates - examines the similarity of the regression paths for groups.

These hypotheses were tested sequentially by constraining the relevant elements of the model to be equal across groups. The effect of these constraints was examined using the χ^2 difference test (Byrne 1998). In essence, these tests establish the degree to which our conceptualization of place attachment applies in different spatial contexts.

Table 3 presents a summary of the analysis. The first test examined the form of the factor solution (H₁) across the two groups. The models were hypothesized to have the same pattern of fixed and free values in the matrices containing factor loadings, structural coefficients, and the variance/covariance matrices. Non-fixed parameters were not restricted to have the same value across groups in this first test. The fit of this unconstrained model was considered adequate ($\chi^2 = 374.96$, *df* = 72, RMSEA = .070, NNFI = .984, CFI = .990). This unconstrained model served as a point of comparison for the second test (equality of scaling) discussed below.

In our second test (H₂), the factor loadings were constrained to be equal across the two groups (Marsh and

²For a more detailed discussion of invariance testing, see Bollen (1989) or Byrne (1998).

Table 2.—Confirmatory factor analysis, internal consistency, and item descriptive

		<i>San Diego</i> (<i>n</i> = 729)					<i>Los Angeles</i> (<i>n</i> = 929)				
		α	<i>M</i>	<i>SD</i>	Factor Loadings	<i>t</i> -value	α	<i>M</i>	<i>SD</i>	Factor Loadings	<i>t</i> -value
Place Identity		.92					.90				
PI ₁	I feel the National Forest is a part of me		3.04	.95	.90	--		3.12	.94	.90	--
PI ₂	I identify with the National Forest		3.12	.93	.87	34.24		3.20	.91	.86	36.98
PI ₃	I feel that my identity is reflected in the National Forest		2.92	.88	.84	31.90		2.90	.85	.84	34.16
PI ₄	Visiting the National Forest says a lot about who I am		3.06	.86	.84	27.81		3.08	.82	.79	29.68
Place Dependence		.69					.73				
PD ₁	I can't imagine a better place for what I like to do		2.88	.88	.83	--		3.20	.91	.88	--
PD ₂	The National Forest is the best place for the recreation activities that I enjoy		3.19	.85	.65	17.26		3.12	.94	.65	18.13
Affective Attachment		.87					.85				
AA ₁	The National Forest means a lot to me		3.63	.88	.91	--		3.08	.82	.91	28.71
AA ₂	I really enjoy the National Forest		3.74	.83	.85	27.61		2.91	.85	.82	23.71
Social Bonding		.88					.88				
SB ₁	I associate special people in my life with the National Forest		3.09	.95	.88	--		3.20	.91	.87	--
SB ₂	The time spent on the National Forest allows me to bond with my family and friends		3.32	.94	.76	21.86		3.12	.94	.76	24.22
SB ₃	Visiting the National Forest allows me to spend time with my family and friends		3.74	.83	.77	22.33		2.91	.85	.77	24.83
Fit index			$\chi^2 = 177.77$, <i>df</i> = 36 RMSEA = .071 NNFI = .984 CFI = .989						$\chi^2 = 197.17$, <i>df</i> = 36 RMSEA = .069 NNFI = .984 CFI = .990		

Note. Items measured on a 5-point scale, where 1 = Strongly disagree and 5 = Strongly agree.

Table 3.—Summary of cross-validation

Model	χ^2	<i>df</i>	$\Delta\chi^2$	Δdf	RMSEA	NNFI	CFI
Baseline							
Cleveland	177.77	36			.071	.984	.989
Angeles and Los Padres	197.17	36			.069	.984	.990
H ₁ - Form	374.96	72			.070	.984	.990
H ₂ - Invariant factor loadings	382.77	79	7.83	7	.067	.985	.990
H ₃ - Regression coefficients	386.97	82	4.20	3	.066	.986	.990

Grayson 1995). The fit of this model was compared with the fit of the model above that did not require this invariance (equality of structure). As shown in Table 3, the imposition of this constraint did not significantly impact the goodness-of-fit indices ($\Delta\chi^2 = 7.83$, $\Delta df = 7$). Thus, the pattern of factor loadings was held constant across the two groups.

For the final test (H_3), equality constraints were placed on each element of beta matrix to test the equality of regression coefficients across two groups. Model fit was compared with the fit indices from the model tested above (H_2) and illustrated that this constraint did not significantly impair the model's fit to the data ($\Delta\chi^2 = 14.20$, $\Delta df = 3$). This finding indicates that the latent structure tested in our hypothesized model was equivalent between the two groups.

3.3. Summary

These findings offer support for the hypothesized model, suggesting that the identity-related dimension would positively predict each of the place attachment dimensions. Specifically, the following relationships were observed in the final model (see Table 4):

- a. *Place dependence* was positively predicted by *place identity* ($\beta = .83$, $t = 35.12$). *Place identity* accounted for 77 percent of the variation in *place dependence* for the San Diego data, and 63 percent of the variation for the Los Angeles data. Thus, the degree of self-identification with these national forests influenced respondents' dependency on the ability of the setting to provide or facilitate functional outcomes (e.g., leisure experiences).
- b. *Affective attachment* was positively influenced by *place identity* ($\beta = .77$, $t = 34.46$) and accounted for 64 percent of the variance for the San Diego data and 65 percent of the variance in the Los Angeles data. Thus, the sentiment respondents associated with the setting was a product of the association between the physical environment and their self-conceptualization.
- c. *Place identity* positively predicted *social bonding* ($\beta = .80$, $t = 34.40$). This dimension accounted for 64 percent of the variance in *social*

Table 4.—Structural model analysis

Dependent variable	β	t-value	R^2	
			San Diego	Los Angeles
Place dependence	.83	35.12	.77	.63
Affective attachment	.77	34.46	.59	.60
Social bonding	.80	34.40	.64	.65

bonding for the San Diego data and 65 percent of the variance for the Los Angeles data. This finding suggests that self-conceptualizations are closely intertwined with respondents' social ties.

4.0 CONCLUSIONS

In this investigation, we adapted identity theory to reposition identity in the conceptualization of human-place bonding. Guided by tenets of identity theory, we proposed a revised causal structure of place attachment in which the cognitive component (place identity) precedes other affective and conative facets. Analyses of two datasets (San Diego and Los Angeles) provided strong support for our reconceptualization of the place attachment construct and its associated measures. In our results, all significant relationships demonstrated that place identity positively predicted the other dimensions (i.e., affective, place dependence, and social bonding). We therefore suggest that identification processes are a driver of other affective and conative elements. As a guide for future model testing, identity theory could provide researchers with a stronger theoretical base to construct hypotheses about the relationships between other leisure-related constructs, such as enduring involvement, commitment, loyalty, and specialization.

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ANGLING

LONGITUDINAL ANALYSIS OF FISHING BEHAVIOR AMONG TEXAS ANGLERS (1990-2006)

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Abstract.—This study examined fishing participation and experience preferences of Texas anglers from a longitudinal perspective. Data were obtained from five independent statewide surveys of licensed Texas anglers conducted by Texas A and M University in 1990, 1994, 1998, 2002, and 2006. We observed the following changes between 1990 and 2006: 1) Fishing participation, especially saltwater fishing, increased; 2) male and minority participation increased; 3) the average age of anglers rose; and 4) the number of anglers from rural areas decreased. There were also changes in fishing motivations. For example, *getting away from the demands of other people* and *being with friends* declined in importance. The number of anglers motivated by social factors and a desire to be in a natural environment increased rapidly over the 16 years; this group of anglers reported a higher participation rate for saltwater fishing, were more likely to own a boat, and felt more satisfied with their fishing experience.

1.0 INTRODUCTION

Expanding cross-sectional survey research into a longitudinal context allows more in-depth analysis of user trends and uncovers the dynamics of recreation behaviors. Yet, with few exceptions, longitudinal analysis in recreation research is rare. Research has shown national declines in the angler population. However, less is known about whether anglers' motivations and behaviors have changed correspondingly. Understanding these trends provides information to create strategies for maximizing

human benefits, engaging current and potential anglers, and conserving natural resources. The purpose of this study was to examine changes in the social, demographic, and psychological characteristics of Texas anglers over time by compiling five statewide surveys (the 1990, 1994, 1998, 2002, and 2006 Statewide Surveys of Texas Anglers) into one large data set for trend analysis.

2.0 LITERATURE REVIEW

2.1 Longitudinal Design in Recreation and Human Dimension Research

To date, most longitudinal studies in recreation are trend studies focusing on profiles of participants. Snepenger and Ditton (1985) explored trends in several socio-demographic, recreation behavior, and resource use indicators for recreational hunting and fishing using the National Survey of Fishing, Hunting and Wildlife-Associated Recreation (FHWAR) (1955-1980). By integrating trend analysis of FHWAR 1980-2006 (United States Fish and Wildlife Service 2007 and U.S Census data 2000-2030, Schuett et al. (2009) found that participation rates for hunting, fishing and wildlife-associated recreation have declined over the last generation. Overall, projections of participation are modest; however, participation increases are expected in the growth areas of the South and West and among nonwhite populations. Kuentzel and Heberlein (2003) conducted a more in-depth trend analysis using combined panel and trend study designs to study relationships among changing visitor characteristics, behaviors, normative standards, and perceived crowding from 1975 to 1997. Their findings suggest that the relationship between crowding perceptions and visitor numbers are unstable over time. Consequently, developing capacities based on a normative model requires continual monitoring of both norms and perceived crowding.

2.2 Motivation-based Trend Studies

In a study of temporal changes in the motivations of freshwater-fishing club members over a 10-year span, Schramm and Gerard (2004) also concluded that

some motivations for fishing (e.g., being outdoors, relaxation, and the experience of the catch) remained consistent over time, while other motivations (e.g., family recreation, being with friends, and obtaining fish for eating) declined in importance. However, their study focused on individual motivational items and did not examine motivations from a multivariate approach. Legare and Haider (2008) used trend study and time series design to explore how the introduction of several restrictive management policies affected hikers at the Chilkoot Trail National Historic Site of Canada. They found that motivation-based clusters differed in their reactions to indicator variables such as advance booking time, perceived management problems, encounters, and satisfaction. One limitation of their work is that the cluster segmentation did not preserve motivation trails identified from the factor analysis.

Trend studies are an important longitudinal method for assessing changes in Americans' recreation participation and use of natural resources. However, there are few motivation-based trend studies in the literature. This study sought to explore changes in Texas anglers' experience preferences in addition to their profiles and participation, using multiple cross-sectional datasets. This study's objectives were to: 1) conduct Spearman's Rank Order Correlation analysis to examine secular trends of anglers' socio-demographic characteristics and participation; 2) examine trends in the importance of individual motivation items; 3) identify motivational factors using principal component analysis; 4) develop motivational clusters (with preserved factor traits) using cluster analysis with K-mode as the centroid and Hamming distance as the distance between the subject and the cluster; and 5) examine participation trends among motivational clusters.

3.0 METHODS

Data were obtained from five independent statewide angler surveys in Texas. The Texas A and M University Human Dimensions Laboratory conducted studies of anglers who obtained licenses in 1990, 1994, 1998, 2002, and 2006 from the Texas Parks and Wildlife Department (TPWD). Computer-generated random samples were selected from the list of licensed anglers

maintained by the TPWD in corresponding years. The questionnaires contained information on anglers' demographics, participation, catch and noncatch motivations, resource use indicators, and attitudes and opinions on a variety of resource management issues.

4.0 RESULTS

4.1 Demographic and Participation Trends

Table 1 summarizes demographic and participation variables. Due to the small number of temporal observations in this study, Spearman's Rank Order Correlation coefficients were employed to demonstrate secular trends over time. Secular trends consist of gradual increases or decreases over time. The Spearman's Rank Order Correlation coefficient is a nonparametric measure of the monotonic relationship between two variables that makes no assumptions about the frequency distribution of the variables (McDonald 2008). Large absolute values for the test statistics are required for monotonic change to be considered significant with a small number of temporal points (Snepenger and Ditton 1985).

The proportion of males in the angler population increased from 79 percent to 85 percent during the study period. The rank order correlation shows that survey year and gender ratio are positively and significantly correlated ($r_s \geq 0.9$, $p = 0.05$, $n = 5$). Changes were identified in the distribution of age cohorts ($r_s \geq 0.9$, $p = 0.05$, $n = 5$). The 45- to 54-year old and 55- to 64-year-old age groups collectively increased from 35 percent in 1990 to 55 percent in 2006. On the other hand, the number of anglers younger than 45 years old declined 20 percent. Upward trends were observed in average household income ($r_s \geq 0.9$, $p = 0.05$, $n = 5$). Although whites continued to be the dominant racial group, the percentage decreased from 92 percent to 84 percent ($r_s \geq 0.9$, $p = 0.05$, $n = 5$). Notably, the population of Hispanic anglers increased over time (from 1 percent to 10 percent) and is now the second largest racial group of Texas anglers. Participation trends for other racial groups such as African Americans and Asians are not monotonic ($|r_s| \leq 0.9$). Finally, a trend of anglers increasingly coming from urban centers was noted ($r_s \geq 0.9$, $p = 0.05$, $n = 5$).

Table 1.—Demographic and participation trends for Texas anglers, 1990-2006

Variables	1990	1994	1998	2002	2006	rs
Gender (%)						
Male	79.6	82.3	80.9	84.0	84.9	0.9*
Female	20.4	17.7	19.1	16	15.1	-0.9*
Age (%)						
18-24	6.5	3.4	5.9	4.2	3.9	-0.4
25-34	23.6	19.5	16.9	12.6	11.9	-1*
35-44	30.3	31.5	30.2	25.7	24.8	-0.9*
45-54	22	25.5	26.6	30.9	29.7	0.9*
55-64	14.5	15.4	17.7	23.1	26.6	1*
>65	3.2	4.7	2.7	3.5	2	-0.5
Income (Median)	40,000-49,999	40,000-49,999	50,000-59,999	60,000-69,999	60,000-69,999	1*
Race						
White	91.1	87.0	83.7	85.2	83.2	-0.9*
Black	3.5	3.6	2.7	2.8	3.8	0.2
Hispanic	0.7	7.9	6.9	10.1	10.1	0.87
Asian/American Indian	4.6	1.1	2.4	1.2	1.6	-0.3
Multi-racial	0	0.4	4.4	0.7	1.5	0.7
Residence						
Rural	77.1	74.5	72.0	71.9	66.3	-1*
Urban	22.9	25.5	28.0	28.1	33.7	1*
Participation (%) in						
Freshwater fishing	70.3	81.4	76.2	71.7	75	0.1
Saltwater fishing	47.8	53.8	59.7	53.6	63.4	0.7
Days fishing in						
Freshwater	23.8	24.8	23.9	22.9	24.9	0.3
Saltwater	18.6	20.4	18.7	19.7	18.4	-0.3
Satisfaction (Mean) ^a						
Freshwater fishing	3.3	3.4	3.5	3.4	3.5	0.7
Saltwater fishing	2.9	3.4	3.4	3.5	3.6	0.9*
Self-perceived skill level (mean) ^b						
Freshwater fishing	1.7	1.7	1.8	1.8	1.8	0.9*
Saltwater fishing	1.7	1.8	1.8	1.8	1.9	1*

^a Measured on a 5-point scale with response categories ranging from 1 (not at all satisfied) to 5 (extremely satisfied).

^b Measured on a 3-point scale with response categories ranging from 1 (less skilled than other anglers) to 3 (more skilled than other anglers).

Freshwater fishing continued to be a favorite activity for Texas anglers. More than 70 percent of respondents indicated that they had fished in freshwater during the previous year in all five surveys. However, the participation rate for freshwater fishing fluctuated over time; freshwater participation peaked in 1994 (81 percent), declined in 1998 (76 percent) and 2002 (72 percent), and then bounced back in 2006 (75 percent). Saltwater fishing participation grew rapidly from 48 percent in 1990 to 67 percent in 2006 except between 1998 and 2002. In 2006, anglers spent an average of 25

days fishing in freshwater, a 1-day increase since 1990. Days spent fishing in saltwater remained constant during the survey period (18 days on average). Self-perceived fishing skill increased moderately for both freshwater and saltwater fishing. The mean score of 1.8 (based on a 5-point scale) indicates that most anglers consider themselves as skilled as or more skilled than other anglers.

4.2 Experience Preference Trends

Overall, anglers' motivations did not change drastically over 16 years (Table 2). The motivations of relaxation,

Table 2.—Importance of motivations^a, 1990-2006

Motivation items	Mean difference		P value ^b	Mean difference		P value	Rank difference	
	1990	1998		1998	2006		1990	2006
To be outdoors	4.05	4.18		4.18	4.21		2	2
For family recreation	3.59	3.77	*	3.77	3.92	*	8	7
To experience new and different things	2.99	3.19	*	3.19	3.36		13	13
For relaxation	4.19	4.31	*	4.31	4.27		1	1
To be close to the water	3.31	3.60	*	3.60	3.78	**	11	9
To obtain fish for eating	2.84	2.87		2.87	2.94		14	14
To get away from the demands of other people	3.66	3.75		3.75	3.77		6	10
For the experience of the catch	3.66	3.92	**	3.92	4.07	**	6	5
To test my equipment	2.06	2.24	**	2.24	2.36		16	16
To be with friends	3.35	3.46		3.46	3.66	*	10	11
To experience unpolluted natural surroundings	3.95	3.94		3.94	3.99	*	5	6
To win a trophy or prize	1.53	1.61	**	1.61	1.57		18	18
To develop my skills	2.59	2.76		2.76	2.87	*	15	15
To get away from the regular routine	4.01	4.06		4.06	4.11	*	4	4
To obtain a “trophy” fish	2.01	2.19	**	2.19	2.17		17	17
For the challenge or sport	3.29	3.41	*	3.41	3.42		12	12
For the fun of catching fish	4.02	4.18		4.18	4.24	*	3	3
To experience adventure and excitement	3.58	3.77	**	3.77	3.86	*	9	8

^a Based on a scale from 1 = very important to 5 = not important at all.

^b Independent samples t-tests; * means $\alpha < .05$; ** means $\alpha < .001$.

being outdoors, for the fun of catching fish, and getting away from the regular routine were consistently the most important motivational items. Winning a trophy or prize, obtaining a “trophy” fish, and testing equipment were consistently the least important motivations. There were significant increases in the importance of many motivation items, but some were not consistent in between-year comparisons. One notable exception was the increasing importance of the experience of catching fish ($p = 0.000$) in both years. On the list of motivations, its ranking increased from seventh in 1990 to fifth in 2006. The motive to get away from the demands of other people dropped from sixth in importance in 1990 to twelfth in 2006, and the item to be with friends had dropped off the top-ten list of items by 2006.

A principal component analysis of all motivations for fishing resulted in four factors with an Eigenvalue

greater than 1 (Table 3). These factors explained 54 percent of the total variance. The four factors were then labeled as: natural environment and social factors (F1), challenge and adventure (F2), skill and equipment (F3), and escape and relaxation (F4). The tests of internal consistency (all $\alpha > .60$) indicated good scale reliability. These motivational dimensions were used for a cluster analysis to segment anglers into homogenous groups. In the variants used in the analysis, distances were computed based on the responses to questions in a particular factor dimension. In other words, this approach preserved the factor or motivational trait.

Figure 1 documents the change in the relative proportion of respondents in each of the segments over the observed time period. The most notable trend was the steady increase in the F1 cluster ($r_s = 1$, $p = 0.05$, $n = 5$) as it gained 11 percentage points to become the second largest

Table 3.—Factor analysis of motivational items

Motivation Items	Component			
	F1 Natural/ Social Environment	F2 Challenge/ Adventure	F3 Skill/ Equipment	F4 Escape/ Relaxation
To be outdoors	.58			
For family recreation	.70			
To experience new and different things	.68			
To be close to the water	.55			
To experience unpolluted natural surroundings	.49			
To be with friends	.44			
For the fun of catching fish		.83		
For the experience of the catch		.71		
For the challenge or sport		.68		
To experience adventure and excitement		.66		
To win a trophy or prize			.83	
To obtain a “ trophy” fish			.76	
To develop my skills			.64	
To test my equipment			.62	
To get away from the demands of other people				.80
To get away from the regular routine				.80
For relaxation				.62
Eigenvalue	5.37	2.02	1.22	1.12
Cronbach’s alpha	0.63	0.79	0.77	0.70
Factor mean	3.54	3.76	2.17	4.00

cluster (29 percent) as of 2006. The F4 cluster contained the largest proportion of anglers during each survey and no significant change over time was found. The number of anglers in the F2 and F3 groups declined, although not significantly. Finally, MANOVA and chi-square tests revealed behavioral differences between clusters. For instance, the F1 anglers had higher participation rates for saltwater fishing than anglers in other groups, were more likely to own a boat, and were more satisfied with their fishing experience.

5.0 DISCUSSION

The objective of this study was to explore trends in demographics, motivations for fishing, and consumptive orientation of recreational anglers from a multi-dimensional, longitudinal perspective. A comparison of our results on demographics and participation with the report of FHWAR (1991, 1996, 2001, and

2006) revealed that the percentage of Caucasian anglers consistently decreased over time in Texas and nationwide. At the same time, Hispanic and other minority groups were quickly increasing their angling participation. These changes were more dramatic in Texas than in the U.S population generally. Texas also had fewer female and senior (above age 65) anglers than the national estimates. On the other hand, Texas had higher saltwater fishing participation rates and more days spent fishing for both freshwater and saltwater anglers. Although fishing participation in the United States continued to decline from 1990 to 2006, the participation of license-purchasing anglers increased in Texas, especially for saltwater fishing. The results suggest a transition to fewer, but more active, anglers. Previous literature indicated that Hispanic anglers are more likely to participate in saltwater fishing (Bissell et al. 1998, Ditton et al.1998, Hunt and Ditton 2001). The dramatic

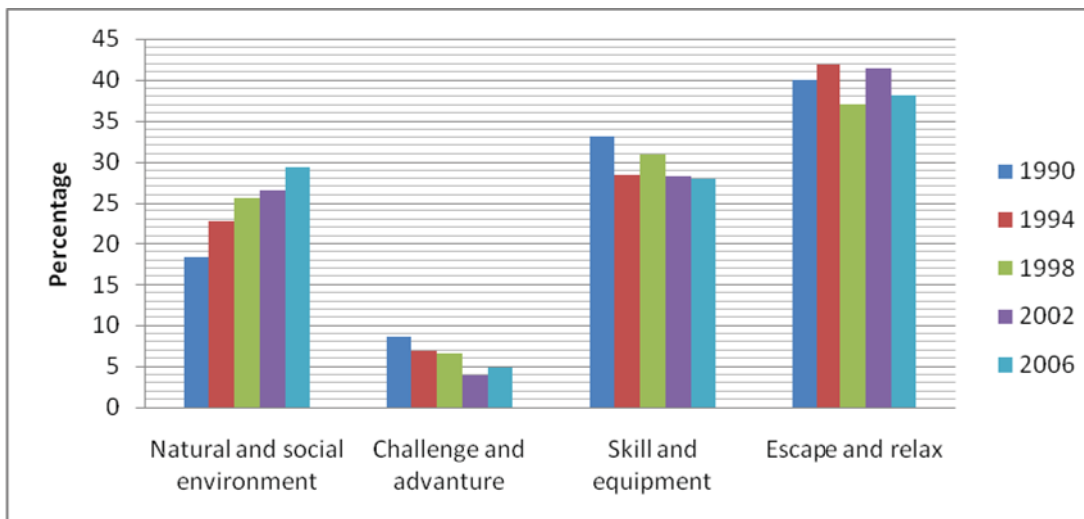


Figure 1.—Trends in motivation clusters 1990-2006.

increases of Hispanic and other minority populations in Texas could be contributing to increased saltwater participation.

Study results on experience preferences indicated that relaxation, being outdoors, experiencing the fun of catching fish, and escaping the day-to-day routine remained important reasons for fishing. Similar motivation items were also as important in other angler studies (Schramm and Gerard 2004). Consistency in the ranking of the majority of the motivation items over time is reasonable because motives are often viewed as relatively stable characteristics of personality (Atkinson 1964). On the other hand, there were changes in the importance of a few motivations. For example, getting away from the demands of other people and being with friends declined substantially in importance. Being with friends may decline as a primary reason for recreational fishing as older anglers leave the fishing population (Schramm and Gerard 2004).

Results from the factor and cluster analyses suggested that anglers were increasingly concerned with the natural environment and social factors and were less motivated by escape, challenge, and skill development motives. We may offer at least two explanations for this trend. First, anglers from densely populated urban areas tend to rate *escape* of lower importance since they are aware that opportunities for fishing in solitude are limited (Fedler and Ditton 1994). Increases in the population

of Hispanic anglers (who tend to prefer family-oriented recreation activities) will positively affect the number of anglers primarily interested in group-based recreation.

6.0 CONCLUSION

The purpose of this study was to monitor changes in recreational fishing experience preferences. This paper has several implications for future research and management. First, this study demonstrates the potential for using secondary data to document baseline participation and to identify change over time. This study also demonstrates the value of examining data from regional populations. Many recreational trend studies still rely on national surveys, while attention should be paid to regional populations and to related social and environmental changes – factors which can impact fishing mode and motives. Managers using generalized results from national surveys may encounter local resistance to proposed statewide regulations. Other data sources are needed to identify regional and national differences. Finally, as anglers increasingly report motivations related to social and environmental factors, researchers and managers need to look beyond motives to understand their behaviors. Other forms of longitudinal study, such as panel surveys (i.e., researching the same anglers over time) could be used to understand micro-level changes. This study supports the need for more research on the relationships between motivational changes and behavioral responses over time, and provides support for including other variables (such as setting preference,

species sought, satisfaction, and response to management) in the analysis. Recreation researchers or managers need to re-evaluate their use of secondary datasets and explore how these datasets can be analyzed to provide useful longitudinal information. Longitudinal data can be most useful when researchers account for differences on questionnaires with respect to wording, contexts, sampling, or analysis techniques that might differ from one survey to the next.

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The content of this paper reflects the views of the authors(s), who are responsible for the facts and accuracy of the information presented herein.

PLACE MEANINGS ASCRIBED TO MARINE RECREATION AREAS: THE CASE OF THE GREAT BARRIER REEF

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Abstract.—One way to understand the attitudes recreation visitors have toward the natural environment is to examine the place meanings they associate with different settings. Meanings provide insight into the value and significance of place to the individual. Previous place research has focused on the meanings ascribed to terrestrial environments, but little research has occurred in marine environments. Using 20 interviews with recreational visitors to Australia's Great Barrier Reef Marine Park, this research identified and described the place meanings ascribed to a large marine environment. Ten place-meaning themes emerged from the informants' statements. Although these meanings were similar to those identified in previous studies, some important and nuanced differences were identified. Based on these findings, researchers and recreation resource managers may be more easily able to identify the thoughts and feelings that visitors ascribe to a marine setting.

1.0 INTRODUCTION

As part of the democratization of the decision-making process in agencies that manage natural resources for recreation, managers of these agencies have started to involve stakeholders (e.g., recreational visitors and residents of surrounding communities) rather than relying upon traditional agency-driven decisions (Williams and Stewart 1998, Cortner and Moote 1999). One way to understand the attitudes stakeholders have toward the natural environment is to examine the meanings they associate with the setting. Stedman (2002) conceptualized place meanings as beliefs and/

or cognitions ascribed to a setting that reflect the value and significance of the setting to the individual. Place meanings manifest themselves in an individual's descriptive statements about 'what kind of place is this?' (Stedman 2008). Identifying the meanings that stakeholders ascribe to a place can aid managers in the decisionmaking process by ensuring that diverse meanings are considered. Taking into account various meanings is important because decisionmaking can inadvertently favor one stakeholder group's meanings over another (Cheng and Daniels 2003, Farnum et al. 2005). Hence, it is in managers' best interests to identify and understand the range of meanings that may be affected by their decisions.

Previous research on place meanings has included only limited discussion of the meanings recreational visitors ascribe to marine settings (Farnum et al. 2005). Most place research has been conducted in North American terrestrial settings. The studies dealing with marine settings have focused on coastal towns and beaches (Vanclay et al. 2008), not on the marine resource itself. Marine settings are unique because they often have a greater abundance and diversity of wildlife (especially near reefs) and greater view distances across the water's surface. In addition, weather generally changes marine surfaces much more dramatically than terrestrial surfaces. Furthermore, with the exception of coastal development, there is less evidence of the human-built environment in marine settings. Finally, the social interaction among people underwater is more limited than in land-based recreation.

The purpose of our investigation was to identify and describe the place meanings that recreational visitors ascribe to a marine recreation area. Identifying and describing these place meanings may help resource managers better understand stakeholders' attitudes toward protecting the resource and stakeholders' support (or lack thereof) for management decisions (Stedman 2003). The theoretical framework of symbolic interactionism was chosen to understand the inherent

social nature within sense of place. The symbolic interactionist approach suggests that the meanings people associate with a setting are the product of processes involving the individual, the setting, and their social worlds (Blumer 1998, Eisenhauer et al. 2000, Kyle and Chick 2007).

The marine environment for this investigation was Australia's Great Barrier Reef Marine Park (GBRMP). The GBRMP, a World Heritage Area, protects 132,800 sq. mi. of habitat for thousands of species of flora and fauna along the northeast coast of Australia (CRC Reef Research Centre Ltd. 2004). This biodiverse ecosystem provides food for many people and attracts millions of recreational visitors each year who contribute more than 1 billion (AUS) dollars annually to the Australian economy (Harriot 2002). Given the lack of information on the place meanings ascribed to marine environments and the importance of the GBRMP to many people, the GBRMP provided a suitable setting for this investigation.

2.0 LITERATURE REVIEW

2.1 Place Meaning

Studies concerning place meaning have often been situated in the literature along with place attachment (Farnum et al. 2005). Place meanings reflect the value of the physical setting, whereas place attachment concerns the intensity of the human-place bond. Kyle and Chick (2007) wrote that "the leisure literature has been primarily concerned with the intensity of recreationists' attachment and less so with the reasons for attachment... It does not represent an understanding of human-place bonding reflected in the broader literature" (p. 209). As a result, the leisure literature has provided only limited insight into the basis of the human-place bond—the meanings that are ascribed to a particular setting.

It is important not to neglect place meanings because, as Tuan (1977) suggested, an unknown physical setting is a "blank space" that only becomes a "place" as it is endowed with meanings through lived experiences. Meanings are a product of the interaction among the setting, the individuals, and their social worlds (Kyle and Chick 2007). Thus, the range of meanings ascribed

to a place is constrained by the attributes of the setting, the individual's cognitions and perceptions related to the setting, and the individual's interaction with others in relation to the setting.

2.2 Place Meaning Typologies

Beyond defining the place meaning concept, researchers have also sought to identify the types of meanings individuals ascribe to a setting. Nassauer (1995) posited that people ascribe meanings to attributes and then interact with the setting while considering the newly defined meanings. This interaction contributes to the repertoire of experiences that the individual has with the setting. In turn, these new experiences redefine the meanings ascribed to the setting. Manzo (2005) observed that people often ascribe meanings of privacy, introspection, and self-reflection to natural settings. Manzo also determined that the natural settings individuals identified as important were often near their home, thus convenient to visit, and that the places were different from work or home (e.g., open spaces with scenic views rather than confined spaces and office views). Finally, Manzo noted that favorite places often provide people with a different setting to explore.

In addition to the meanings that people ascribe to natural environments generally, some meanings are specific to protected natural resource areas. These meanings may be influenced by culturally defined labels such as "National Park," "National Forest," and "wilderness" (Kyle et al. 2004). Gunderson and Watson (2007) identified seven primary types of meanings that individuals ascribed to frequently visited natural areas in Montana's Bitterroot National Forest. Visitors mentioned the ease of access to wild places; the naturalness/roadlessness of the setting; the uniqueness of the places compared to settings in their daily lives; the historic or traditional importance of the setting to their family or social network; the scenic attractiveness or beauty; and physical features of significance (e.g., unique geologic formations). Bricker and Kerstetter (2002) reported on the meanings river rafters associated with the South Fork of the American River in California. Their respondents indicated that the river's beauty, their shared experiences with friends, and the joy of running the river were important meanings.

3.0 METHODS

To understand the meanings recreational visitors ascribed to the GBRMP, the first author collected data through 20 semi-structured key informant interviews. The initial informants were chosen because they were known to have an extensive association with the GBRMP and were recreational users of the waters surrounding the reef. Key informants were chosen to include at least one individual from each of the following groups: tourist industry representatives; managers from local, state, and federal agencies who work on or near the GBR; and recreational visitors, both local residents and tourists. To identify subsequent informants, initial informants were asked to suggest others who met the criteria above. This snowball sampling method recruited participants who were able to describe their attitudes and the place meanings they ascribed to the reef in rich detail (Merriam 1998). As suggested by Creswell and Plano Clark (2006), interviews were conducted until data saturation was reached; subsequent interviews did not reveal additional ideas and information.

Although the interviews were designed to be as conversational as possible, two prompts were adapted from Schroeder (1996) to ensure that the conversations addressed the place meanings that informants ascribed to the GBRMP. The first prompt asked informants to give a physical description of a place that stood out in their mind “as being important, memorable, meaningful, or special” to them personally. The second prompt asked them to “describe the thoughts, feelings, memories, and associations that come to mind when you think about this place...” With the participants’ permission, each interview was recorded using a digital audio recorder. As suggested by Merriam (1998), a reflexive journal was also kept to record the interviewer’s thoughts about the process. Thus, the interviewer could evaluate and update the interview process between interviews. As a result of this record-keeping, the interviewer fine-tuned the interview probes to encourage informants to give more detailed responses to the prompts.

Interviews were conducted between July and August 2008. All of the individuals contacted agreed to participate. Participants ranged in age from 24 to 70

years (M=46) and 13 (of 20) were male (see Table 1). The informants had spent from 3 years to their whole lives interacting with the reef; most respondents had been coming to the GBRMP for 20-25 years. Analysis of the data obtained through the key informant interviews began immediately after the first interview. Using transcriptions of the interviews and field notes, the first author and a colleague independently coded the key informants’ statements and sorted them into discrete elements. Following the open coding of respondents’ transcripts, we evaluated the list of ideas using constant comparison to identify similarities and distinctions (Merriam 1998). Specifically, we each grouped together the ideas identified in the open coding to form categories of similar ideas and assigned each category a title consistent with the theme of the ideas reflected therein. Once data were coded, Holsti’s inter-rater reliability test was conducted. The inter-rater reliability between the two researchers for the themes identified from these data was 90.9 percent, indicating an acceptable level of reliability (Miles and Huberman 1994). In addition, as Merriam recommends, to ensure the validity of the themes identified, we sought feedback on the themes from colleagues who are knowledgeable about place meaning.

4.0 FINDINGS

During the interviews, the informants identified a favorite or special place within the GBRMP, described the physical characteristics of the setting, and explained the meanings they ascribed to these places. Coding of the transcripts of the their narratives revealed more than 30 unique ideas. Using constant comparison to identify similarities and distinctions, we identified the following 10 themes: *aesthetic beauty*; *lack of built infrastructure/pristine environment*; *the abundance and diversity of coral and other wildlife*; *a unique natural resource*; *facilitation of desired recreation activity*; *safety and accessibility*; *curiosity and exploration*; *a sense of connection to the natural world*; *escape from the everyday*; and *experiences with family and friends*.

4.1 Aesthetic Beauty

The first several place meaning themes were defined, in part, by the informants’ interaction with the physical attributes of the setting. One theme that arose in all

Table 1.—Descriptions of key informants

Informant	Description
1	About 40 years old. She is employed as a researcher for one of the governmental resource management agencies and enjoys recreational fishing in the GBRMP.
2	In his 50s. Has had a life-long interaction with the GBR. He works as a community representative for a management agency. He enjoys boating in the GBRMPA with his family.
3	55 years old. Enjoys sailing his yacht with his wife along the coast for about 6 months every year.
4	He and his wife (both in their 60s) live aboard their motor-yacht. They are originally Americans.
5	He has been working in the GBRMP area his entire adult life in commercial diving and shipping. He is about 60 and enjoys yachting (motor) in his free time.
6	A 45-year-old SCUBA diver who has been diving on the GBR for 20 years.
7	24 years old. Employed by an environmental NGO. Self-described as a “greenie,” she enjoys snorkeling.
8	An avid snorkeler is in his early 30s. He has visited the reef since his early teens.
9	In his late 50s. He is an elected official who enjoys recreational fishing in the GBRMP.
10	In his late 30s. Employed by a management agency. Enjoys recreational fishing. He is of Torres Strait Islander descent and has interacted with the reef his entire life.
11	In her 30s. An avid SCUBA diver. She has been diving the GBR for >5 years.
12	About 40. A journalist who occasionally writes about the reef. He has enjoyed recreational fishing his entire life.
13	A manager in a government environmental agency. He has enjoyed snorkeling and island camping most of his 50 years.
14	An environmental activist who participates in SCUBA diving. She is about 30.
15	70 years old. Has been recreationally fishing the GBR for most of his adult life.
16	38 years old. Has gone to the reef for recreation his entire life. Has also worked in research and commercial fishing.
17	About 40. Operates a sailboat charter business.
18	A member of a GBR citizens advisory group. He is in his 60s and yachts (sail) in his free time.
19	About 45. Grew up in the Townsville area. She now lives in South Australia and was visiting the GBRMP as a tourist.
20	About 50. Manages a dive shop. He has been leading dive trips to the reef his entire adult life.

the interviews was the *aesthetic beauty* of the land and seascapes of the GBRMP. Many people cited the clarity and color of the water, the sandy beaches, the beauty of the coral reef structures, the openness of the views, and/or the sounds of the waves and wildlife. The participants used several common descriptors to illustrate the visual appeal of the places they discussed, such as “amazing,” “fabulous,” and “spectacular.”

4.2 Lack of Built Infrastructure/Pristine Environment

Many participants mentioned the lack of built features in the GBRMP and/or suggested that the setting was “undeveloped,” “pristine,” or “wilderness.” Meanings that were included in this theme were constructed from

a combination of cognitive responses (e.g., categorizing similarities and differences among a specific setting in the marine park and other settings in the informants’ lives) and emotional responses (e.g., the enjoyment of solitude) to interacting with the physical attributes of the setting. We also found evidence that socially constructed terms like “wilderness” had a shared definition among the informants.

4.3 Abundance and Diversity of Coral and Other Wildlife

Besides the inanimate objects that formed the setting, informants also indicated that interaction with wildlife contributed to the creation of meanings that they ascribed to the setting. Several people expressed their

excitement about the wildlife by listing all the species with which they had come into contact. All of them also specifically identified the quantity and diversity of coral as an important feature.

4.4 Unique Natural Resource

Many of the informants made it clear that they thought the Marine Park was a unique natural resource and contrasted it with other marine environments around the world. Referring to the abundance of wildlife, one respondent declared, “You don’t get that anywhere else.” Others emphasized the uniqueness of marine environments, and specifically the GBRMP reefs, as compared to terrestrial environments.

4.5 Facilitation of Desired Recreation Activity

In addition to the landscapes/seascapes and wildlife, the informants also discussed how the attributes of their favorite setting in the GBRMP facilitated the type of recreational activities in which they participated. Several people spoke about how the abundance and diversity of fish were good for angling. Similarly, sailors on yachts noted that the reef provided relatively smooth waters along the coast, which made sailing enjoyable. The recreational divers who participated in this study said that their favorite places within the GBRMP had several attributes that made SCUBA diving fun and exciting.

4.6 Safety and Accessibility

The first several place meaning themes that emerged from the participants’ narratives involved the physical attributes of the setting. The next set of themes included less discussion of physical attributes and more description of the thoughts and feelings the individuals associated with their favorite places.

Although the *safety and accessibility* theme was manifested in different ways for each informant, most of the places visited by the informants lie between the coast and the outer reef, where they are protected from the open ocean. Several informants also mentioned that the proximity of infrastructure (e.g., marinas and the Australian Volunteer Coast Guard) contributed to their sense of safety. Ease of access to their favorite places in the GBRMP was closely

linked with safety in many participants’ statements. Ease of access was generally based on proximity of the Great Barrier Reef to shore and the well developed infrastructure that makes places in the GBRMP easy to reach.

4.7 Curiosity and Exploration

Most of the key informants mentioned that they enjoyed observing and learning while visiting their favorite places in the GBRMP. Others spoke about exploring underwater reef structures and islands or identifying new routes to use while sailing. In general, the informants’ narratives emphasized the importance of interacting with the environment through observation and discovery.

4.8 Connection to the Natural World

Almost all of the participants described a sense of connection with the natural environment during recreation in the GBRMP. Many said that being in the place they described gave them a sense of immersion in the natural world. Several indicated that recreation in certain places in the GBRMP gave them an understanding of the interconnectedness of ecosystems. Similarly, others said that exploring the GBRMP places helped them understand how people impact the reef system.

4.9 Escape from the Everyday

Many informants said that visiting their favorite places in the GBRMP allowed them to *escape from the everyday* of their lives. Every informant made this comment, usually more than once. For many, solitude was essential to the feeling of escape. In addition to ‘escape,’ they used words and phrases like “freedom,” “isolation,” “not having to answer the phone,” “going to another space,” “re-create,” and “relaxed.”

4.10 Family and Friends

The final theme that emerged from the key informant interviews concerned the participants’ social interaction with *family and friends*. The informants used important places in the GBRMP as backdrops for memories of enjoyable experiences with family, coming-of-age stories, and the passing of family stories and knowledge to younger generations. Participants spoke about the joy of

sharing the place with others and about how interactions with others improved (or hindered) their experiences. Beyond demonstrating the importance of family and friends to the meanings these informants ascribed to their respective settings, the narratives also illustrated the relationship between place meanings and individual identity. When one informant told me that he brought his children to his favorite place “to partly understand why I do the job I do and why I was passionate about it,” it was clear that he thought the place reflected his values and important parts of his personal and professional identity.

5.0 DISCUSSION

Generally speaking, the 10 themes identified in the data were similar to those described in previous literature. Any disparities were the result of nuanced differences in the setting, the individual, and the social worlds in which the individual operated.

The physical attributes of the marine setting contributed strongly to the informants’ place meanings. As in previous research (Bricker and Kerstetter 2002, Schroeder 2002, Gunderson and Watson 2007), informants mentioned aesthetically beautiful features like sea/landscapes, open vistas, and the presence of verdant foliage. One distinction between the narratives in the present study and most previous research is the descriptive attributes of water. Participants described the beauty of the water in terms of color and clarity, in contrast with terrestrial settings, where the mere presence of a water feature is important (Farnum et al. 2005). In addition, past research has found that wildlife has meaning for recreationists as part of the physical attributes of the setting; in this research, wildlife is a stand-alone theme. Some participants mentioned that on land you see wildlife intermittently while in the GBRMP you encounter wildlife almost continuously. This repeated interaction with the flora, fauna, and geological structures that make up the physical attributes of the environment may provide the basis for the influence of setting on the creation of place meanings.

In this and previous studies, the lack of built infrastructure/pristine environment theme is associated with privacy (Manzo 2005), naturalness, and wilderness

values (Gunderson and Watson, 2007) and is contrasted with urban settings. Similarly, the escape from the everyday and the unique natural resource themes were similar to meanings identified by Manzo (2005) and Gunderson and Watson (2007). However, in the current investigation, almost all of the recreational visitors spontaneously spoke about the intrinsic value of nature. The similarity between the informant narratives suggests that there is a common understanding of what makes the GBRMP unique. Kyle et al. (2004) note that labels such as “Marine Park” and “World Heritage Area” often symbolize culturally defined images. This terminology exemplifies how the interaction among the setting, the individual, and the larger social world helps create place meanings for individuals.

In addition to the attributes of the setting, the individual’s cognitive and emotional perceptions also contribute to the meanings he/she ascribes to important or special places. This finding was manifest in references to curiosity and exploration, safety and accessibility, and the importance of how (and the degree to which) a place facilitates desired recreational activities. All of the participants in this investigation mentioned that their favorite places in the GBRMP made such activities as SCUBA diving, snorkeling, angling, and cruising enjoyable. This response is comparable to the joy experienced by rafters while running the American River as described by Bricker and Kerstetter (2002). The physical layout of a setting both allows for and constrains opportunities to explore safely and engage in certain recreational activities.

However, the type of individual who engages in these activities is also significant. Exploration and many of the recreational activities cited by the informants are adventurous and individuals who participate in these activities often have a perception of self-efficacy and personal identity that make these activities and settings enjoyable (Paxton and McAvoy 2000). It may be that individuals’ characteristics shape their thoughts and feelings about a place, which, in turn, influence the meanings they ascribe to the place. Furthermore, when ascribing meaning to places in the GBRMP, the informants were often influenced by other people through direct interactions (e.g., with other divers

during or after the dive) and/or mediated interaction (e.g., magazines, brochures, and videos). By interacting with others, the informants gained new information and experiences that could be incorporated into subsequent meanings ascribed to the GBRMP. Because recreational visitors to marine settings share many individual characteristics and social influences with recreational visitors to terrestrial settings, both groups form similar meanings related to their favorite places.

The influence of social factors on the formation of place meanings was most clear in narratives in the family and friends theme. Some of the meanings identified in this research dealt with the historic and traditional importance of the place to the informants' families. Likewise, many of the recreational visitors to the GBRMP enjoyed certain places because they had shared experiences there with friends.

6.0 CONCLUSION

This investigation was one of the first to describe place meanings ascribed to a marine environment. Future research in the GBRMP may seek to better understand the relationships among place meanings, recreational visitors' attitudes toward the reef, and management actions that affect the reef. Furthermore, additional research may lead to a better understanding of how place meanings are ascribed to a setting and maintained through shared symbols (e.g., language) and experiences (e.g., recreational activities).

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RECREATION NORMS

NORMATIVE TOLERANCES FOR SCUBA DIVERS AND SNORKELERS: AN APPLICATION OF THE POTENTIAL FOR CONFLICT INDEX₂

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Abstract.—This study examines Florida Keys snorkeler and SCUBA diver encounter norms using the Potential for Conflict Index₂ (PCI₂). Snorkelers and SCUBA divers evaluated the acceptability of encountering a specific number of other snorkelers and SCUBA divers on a 7-point scale ranging from extremely acceptable (3) to extremely unacceptable (-3). Statistical analysis results were put into PCI₂ templates to construct a graphic display of encounter norms for each recreation group. According to both snorkelers and SCUBA divers, as encounters increase, acceptability evaluations decrease. In addition, acceptability starts to decline at an encounter level of 5, not 0, which may be a function of safety. All recreationists consider a large number of snorkelers to be more acceptable than the same number of SCUBA divers, possibly due to their location in the water column.

1.0 INTRODUCTION

Social scientists use the concept of norms to understand and explain human behavior. Norms can refer to what most people are doing (a descriptive norm) or to what people should do (an injunctive norm) in a given situation (Cialdini et al. 1991). Social norms are standards shared by the members of a group (Vaske et al. 1986), while personal norms are an individual's own expectations learned from shared expectations (Schwartz 1977). Norms vary by the proportion of people who hold them, their strength in an individual or group, the level of agreement about them, their influence on behavior, and their wider enforcement of social regularities. Norms, however, are not static

within or across people, or situations. Because norms are multi-faceted, the concept is used differently within the social sciences and in their applications to natural resource issues. For example, one conceptual tradition is descriptive, emphasizing the structural characteristics of norms (e.g., prevalence, range of tolerable conditions, intensity, crystallization), which provide a framework for evaluating behaviors in a social setting (Shelby et al. 1996, Donnelly et al. 2000, Vaske and Donnelly 2002, Vaske and Whittaker 2004).

Each year, more than 3 million tourists travel to the Florida Keys to participate in water-based recreation (Park et al. 2002). Although water-based recreation is extremely popular, relatively few studies have focused on SCUBA divers and snorkelers. The literature has examined SCUBA diver or snorkeler specialization (Todd et al. 2000, Thapa et al. 2006), carrying capacity (Davis and Tisdell 1995), motivations and expectations (Lusby and Cottrell 2008), and conflict (Lynch et al. 2004). Even norms-based literature on these groups (Inglis et al. 1999) does not compare the norms of each. This paper uses the structural norm approach to better understand SCUBA diver and snorkeler evaluations of differing numbers of encounters with other recreationists. The Potential for Conflict Index₂ (PCI₂), which is grounded in the theoretical logic of the Theory of Reasoned Action, is used to display respondents' level of agreement regarding acceptable encounter levels (Fishbein and Ajzen 1975).

1.1 The Structural Norm Approach

The structural norm approach focuses on the characteristics of social norms through use of a graphic device that Jackson (1965) initially described as the Return Potential Model (i.e., impact acceptability curves). When this approach is applied to environmental conditions, impacts are displayed on a horizontal axis while evaluation (e.g., acceptability) is displayed on the vertical axis. The curves depict social norms as aggregate averages of personal norms, but they can also describe evaluations for an individual (a personal norm curve).

Interpretation of the curve is provided by Shelby et al. (1996).

The curve can be analyzed for various normative characteristics... The high point of the curve shows the optimum or best situation... The relative distance of the curve above or below the neutral line defines the range of tolerable conditions. Finally, the variation among evaluations at each impact level shows the amount of agreement or crystallization. Evaluative standards for backpacking in a wilderness setting, for example, often have an optimum of zero encounters, a low range of tolerable contacts, high intensity, and high crystallization while norms for hiking in a developed recreation area tend to show a greater tolerable range, lower intensity, and less agreement... For deer hunting..., too few people can be evaluated as negatively as too many; hunters want enough people to move deer, but not so many as to compete for resources.

This structural norm approach is powerful because it facilitates the development of standards for acceptable social and physical conditions that are central to management frameworks such as Limits of Acceptable Change, Visitor Impact Management, or Visitor Experience and Resource Protection (Shelby and Vaske 1991). Although the visual approach has proven useful for understanding a wide range of natural resource topics, crystallization is typically not presented. To overcome this limitation, this paper incorporates the PCI_2 into the structural norm methodology. The PCI_2 provides a way to display group agreement and the other structural characteristics of norms.

1.2 The Potential for Conflict Index₂

Many research studies in leisure, recreation, and human dimensions of natural resources apply survey methodologies and quantitative analytical techniques to improve understanding of complex concepts such as motivations, attitudes, and norms (Vaske 2008). The goal is to provide information that can inform and improve decisionmaking. When communicating results to nontechnical audiences, however, it is important that researchers clearly convey the meaning of the quantitative

analyses and the statistical and practical implications of findings. Basic summary statistics, for example, describe a variable's distribution in terms of central tendency (e.g., mean), dispersion (e.g., standard deviation), and shape (e.g., skewness). Although these statistics provide useful information, an accurate understanding of a distribution requires consideration of all three indicators simultaneously. The challenge of communicating statistics to non-technical audiences is compounded by the complexity of concepts investigated (e.g., attitudes, norms) and measurement scales used. The PCI_2 and an associated graphic technique for displaying results were developed to facilitate understanding and interpreting statistical information (Manfredo et al. 2003, Vaske et al. 2006). This approach requires little statistical training to understand results, minimizes effort required to process information, and increases comprehension (Vaske et al., in review).

To facilitate visual understanding of social survey data, PCI_2 results are displayed as bubble graphs that simultaneously describe a variable's form, dispersion, and central tendency (see Figs. 1 and 2). The PCI_2 ranges from 0 (complete agreement, consensus) to 1 (complete disagreement, no consensus). The least amount of consensus and greatest potential for conflict ($PCI_2 = 1$) occurs when responses are equally divided between the two extreme values on the scale (e.g., 50 percent highly unacceptable and 50 percent highly acceptable). A distribution with 100 percent at any one point on the response scale yields a PCI_2 value of 0 and suggests complete consensus and no potential for conflict. Therefore, the size of the bubble depicts the magnitude of the PCI_2 and indicates degree of dispersion (e.g., extent of potential conflict regarding acceptance of a management strategy). A small bubble (e.g., $PCI_2 = .04$) suggests little potential for conflict (i.e., high consensus); a larger bubble (e.g., $PCI_2 = .74$) suggests more potential for conflict (i.e., less consensus). The center of the bubble is plotted on the y -axis corresponding to the mean value (i.e., central tendency). Given a zero neutral point for a variable, the bubble's location shows whether respondents' average evaluations are above, below, or at the neutral point or acceptable, unacceptable, or neutral, respectively. Information about a distribution's skewness is conveyed by the position of the bubble relative to the

neutral point. Bubbles at the top or bottom of the graph are more skewed than bubbles that are centrally located.

1.3 The Logic of the PCI₂

The PCI₂ formulation assumes that conflict or a lack of consensus arises because people take opposing positions on issues. As described in the Theory of Reasoned Action (TRA), people partially base their positions on subjective norms about what they think other people believe they should or should not do in a given situation (Fishbein and Ajzen 1975). Therefore, in responding to survey questions about cognitions (e.g., norms, attitudes, behavior), some people may form their evaluations relative to where they perceive others are on the topic. The “location” of one person (person *x*) relative to another person (person *y*) might be approximated as the distance between their responses (*r_x* and *r_y*). In the PCI₂, the distance, *d_{x,y}*, between people contributes to a potential for conflict that can be specified as *f(r_x, r_y)*. There are alternative ways, however, to formulate *d_{x,y}*. For example, *d_{x,y}* can be defined as the absolute value of *x*’s response (*r_x*) minus *y*’s response (*r_y*) (i.e., *d_{x,y}* = |*r_x* - *r_y*|). Logic, however, suggests two problems with this formulation. First, two people with responses of -3 and -2 are not necessarily in conflict; they both find the situation unacceptable and differ only slightly in the degree to which their views are held. Second, people with negative or positive responses may perceive no conflict with a person who is neutral on the topic. Thus, a *d_{x,y}* > 0 may exist only between any negative response and any positive response. Thus, one possible formulation of *d_{x,y}* (i.e., *DI*) can be defined by:

$$DI = d_{x,y} = (|r_x - r_y| - 1) \text{ if } \text{sign}(r_x) \neq \text{sign}(r_y) \text{ (e.g., } r_x = -3 \text{ and } r_y = +1)$$

$$\text{otherwise } d_{x,y} = 0$$

where:

- d_{x,y}* = distance between people on a variable
- r_x, r_y* = response *x* and response *y*, respectively
- sign = the sign for a positive or negative number (+ or -)

DI does not include “neutral” responses in the calculation of distance. The distance from a person who has a negative evaluation to a person who has a positive

evaluation is calculated as if there were no neutral category by subtracting 1 (e.g., distance from -2 to +1 is 2, not the algebraic difference of 3).

1.4 Calculating the PCI₂

For an *i*-value scale with *k* levels (e.g., *k* = -3 to +3), let *n_k* be the number of respondents for each scale value and *n_h* be the number of respondents at other scale values. For *k* ≠ *h*, *n_k* respondents are at some distance from *n_h* respondents. If distances are assumed to be symmetric (i.e., *d_{h,k}* = *d_{k,h}*), each of the *n_k* respondents are a distance, *d_{h,k}*, from *n_h* respondents. There are *n_hn_k* distances from “*h*” to “*k*” and the same number from “*k*” to “*h*.” Therefore, 2*n_hn_k* distances contribute to a total. Consider two matrices with elements that are distances and products (e.g., *n_hn_k*). The diagonals of the matrices contain people with the same response, so total distance associated with the diagonal is 0. Other distances are 0 except those associated with a negative-positive rating combination (e.g., -2 and +3). The PCI₂ for an *i*-value scale, therefore, can be defined as:

$$PCI_2 = \frac{\sum n_k n_h d_{k,h}}{\delta} \text{ for } k = 1 \text{ to } i \text{ and } h = 1 \text{ to } i$$

where:

- n_k* = number of respondents at each scale value
- n_h* = number of respondents at other scale values
- d_{k,h}* = distances between respondents
- δ_{max} = maximum distance between extreme values multiplied by the number of times this distance occurs

2.0 METHODS

2.1 Sample Design

The data were obtained from individuals who were SCUBA diving or snorkeling on the Florida Keys’ reefs. Intercept surveys were conducted on the water at reef locations and at dive and snorkel businesses. When sampling occurred on the water, all reefs in the area were visited during a “patrol.” On days when sampling occurred on land, all participating businesses in a region were visited at some point during the day. Interviewers attempted to intercept all parties at that location at that time. For each group, one name and address per household was obtained from the person over 18 with the most recent birthday. This phase of data collection

occurred 1 week per month between June 2006 and July 2007 and yielded 2,867 names and addresses. These individuals received a mail survey. After three follow-up mailings to non-respondents, 1,591 completed surveys were returned (response rate = 58 percent).

2.2 Variables Measured

Independent variable. Snorkelers and SCUBA divers received the same survey. Respondents were asked to classify themselves as either snorkeler or SCUBA diver, the independent variables in this article.

Dependent variables. Respondents evaluated encounters with 0, 5, 10, 15, 20, 25 and 25+ SCUBA divers (and snorkelers) on 7-point scales ranging from -3 (extremely unacceptable) to +3 (extremely acceptable), with 0 as the neutral point.

3.0 ANALYSIS

Independent-samples *t*-tests were performed between SCUBA divers and snorkelers on each of the 14 evaluation contexts (i.e., 7 ratings of encounters with SCUBA divers and 7 ratings for seeing snorkelers). Point biserial correlations (r_{bp}) were used as an indicator of effect size. Following the logic and labels suggested by Vaske (2008), a correlation of 0.1 was considered “minimal,” 0.3 was “typical” and an $r_{bp} \geq 0.5$ was labeled “substantial.”

Actual values of PCI_2 were computed using the SPSS macro described in Vaske et al. (in review) and available at <http://welcome.warnercnr.colostate.edu/~jerryv>. Using the actual distribution of responses for each of the 14 evaluation variables, the SPSS macro generated a simulation ($n = 400$) based on probabilities associated with the number of people reporting a particular response (i.e., -3, -2, -1, 0, 1, 2, 3). The standard deviations calculated from the simulation were used to compare the actual PCI_2 values with the following formula:

$$d = \frac{ABS(PCI_a - PCI_b)}{\sqrt{(PCI_{aSD})^2 + (PCI_{bSD})^2}} \text{ where } d \text{ is considered to be } N(0,1)$$

where:

ABS = Absolute value

PCI_a = Actual PCI_2 for the first sample

PCI_b = Actual PCI_2 for a second sample

PCI_{aSD} = Standard deviation of the simulated PCI_2 distribution for the first sample

PCI_{bSD} = Standard deviation of the simulated PCI_2 distribution for the second sample

4.0 RESULTS

Both SCUBA divers and snorkelers ranked 0 encounters less positively than five encounters (Tables 1 and 2). Snorkelers evaluated five or more encounters with fellow snorkelers more positively than SCUBA diver encounters ($t \geq 7.90$, $p < .001$, $r \geq .53$ for all encounters greater than 5). SCUBA divers evaluated 10 or more encounters with other SCUBA divers less favorably than seeing comparable numbers of snorkelers ($t \geq 7.25$, $p < .001$, $r \geq .55$ for all encounters greater than 10). Snorkelers evaluated 10 SCUBA divers and 15 other snorkelers as acceptable, while SCUBA divers evaluated 10 snorkelers and 10 other SCUBA divers as acceptable. Both groups reported less consensus (larger PCI_2 values) for in-group encounters (especially 0 and 10 encounters) and there was greater consensus (smaller PCI_2) for higher encounter levels.

Displaying these results graphically using the PCI_2 clarifies the relationships. Snorkelers ranked 0 SCUBA divers as being the most acceptable density, 15 as unacceptable, and 25 SCUBA divers as the least acceptable number of encounters (Fig. 1). Snorkelers' evaluation of other snorkelers is slightly different. While there is a steady decline in acceptability evaluations as encounters increase, this decline does not occur until encounter level 5, which receives the highest acceptability rating and the most consensus about the mean. Also, consensus increases as encounters increase and acceptability decreases. All encounter levels are significant at $p < .05$ except 5 and 15.

For SCUBA divers, the PCI_2 model shows that five is the most acceptable number of encounters with other SCUBA divers (Fig. 2). The most consensus also occurs at this encounter level. From this encounter level, acceptability declines until unacceptability emerges at 15. The most acceptable number of snorkelers according to SCUBA divers is 0. At that density, as number of encounters increases, acceptability declines and consensus increases. All encounter levels are significant at $p < .05$ except 5 and 10.

Table 1.—Snorkeler evaluations of SCUBA diver and snorkeler density

Density	Snorkeler's Acceptability of: ^a		<i>t</i> -value	<i>p</i> -value	<i>r</i> -value
	SCUBA Divers	Snorkelers			
0	1.59	1.32	3.93	<.001	.667
5	1.36	1.89	10.00	<.001	.537
10	.25	1.33	16.17	<.001	.525
15	-.52	.53	15.94	<.001	.614
20	-1.20	-.35	13.28	<.001	.640
25	-1.56	-.98	10.16	<.001	.670
>25	-1.95	-1.55	7.90	<.001	.720

^a Mean values. Variables coded on a 7-point scale: 3= extremely acceptable, 2= very acceptable, 1= somewhat acceptable, 0= not sure, -1= somewhat unacceptable, -2= very unacceptable, -3= extremely unacceptable.

Table 2.—SCUBA Diver evaluations of SCUBA diver and snorkeler density

Density	SCUBA Diver's Acceptability of: ^a		<i>t</i> -value	<i>p</i> -value	<i>r</i> -value
	SCUBA Divers	Snorkelers			
0	1.21	2.00	11.32	<.001	.501
5	1.76	1.69	1.65	.100	.482
10	.36	.78	7.25	<.001	.548
15	-.78	-.08	11.96	<.001	.577
20	-1.55	-.82	13.17	<.001	.582
25	-2.03	-1.30	13.93	<.001	.576
>25	-2.32	-1.64	13.02	<.001	.548

^a Mean values. Variables coded on a 7-point scale: 3= extremely acceptable, 2= very acceptable, 1= somewhat acceptable, 0= not sure, -1= somewhat unacceptable, -2= very unacceptable, -3= extremely unacceptable.

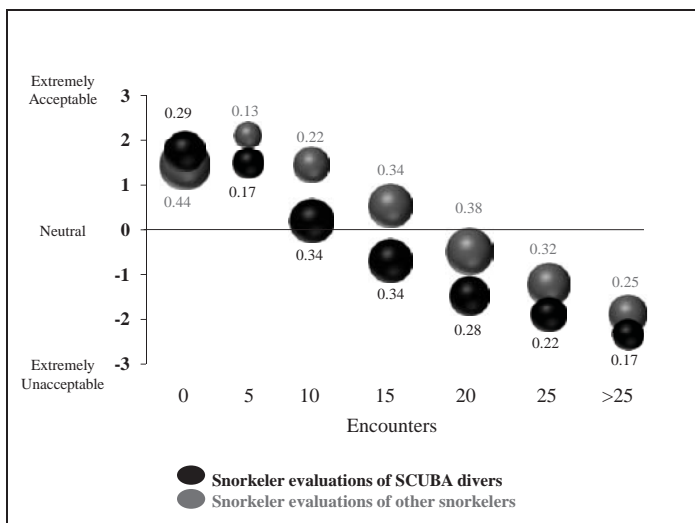


Figure 1.—Potential for Conflict Index₂ model illustrating snorkeler encounter norm evaluations. (PCI₂ values are significant at *p* <.05 for 0, 10, 20, 25, and >25 encounters.)

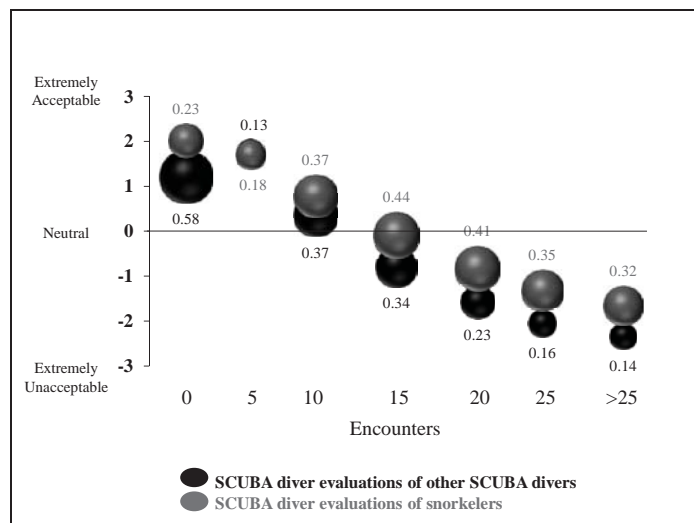


Figure 2.—Potential for Conflict Index₂ model illustrating SCUBA diver encounter norm evaluations. (PCI₂ values are significant at *p* <.05 for 0, 15, 20, 25, and >25 encounters.)

5.0 DISCUSSION

This purpose of this study was to analyze encounter norms between Florida Keys snorkelers and SCUBA divers. While snorkeler acceptability evaluations decrease as the number of other snorkelers increases, this decline does not occur at an encounter level of 0. Instead, five snorkelers are viewed as more acceptable than 0, with very high crystallization. This is also the case with SCUBA diver evaluations of other SCUBA divers. Therefore, while each group views 0 as the most acceptable number of recreationists from the other group, they both evaluate 5 as the most acceptable in-group encounter level. SCUBA diving and snorkeling can be dangerous activities. Therefore, it is a recommended and accepted practice that those activities are performed with a buddy (at least one other person). Therefore, the fact that 5 is the most acceptable in-group encounter level according to both groups may be a safety issue and a product of the buddy system. To test this claim, a duplicate study should be executed with encounter levels divided into smaller increments to determine precisely which encounter level is most acceptable.

When snorkelers evaluate SCUBA divers, acceptability ratings decrease as encounters increase. Also, as evaluation ratings decrease, consensus increases, meaning that as a group, snorkelers view more encounters of SCUBA divers as unacceptable. Snorkelers select 10 as the most acceptable number of SCUBA divers, but are more accepting of their own recreation group, evaluating 15 as the most acceptable number of snorkelers. Overall, when evaluating snorkelers and SCUBA divers, snorkelers repeatedly evaluate other snorkelers as more acceptable than SCUBA divers. Interestingly, SCUBA diver evaluations of snorkelers follow the same trends. SCUBA divers view 10 as the most acceptable number of other SCUBA divers, and while not fully tolerant of seeing 15 snorkelers in the water (SCUBA divers evaluate an encounter level of 15 snorkelers as unsure), they evaluate 15 as a definitively unacceptable number of SCUBA divers.

Analogous to results from snorkeler density evaluations, SCUBA divers evaluate snorkelers as more acceptable

than other SCUBA divers, and do so with accord. A possible explanation for this response is the recreationists' location in the water column. Snorkelers, for the most part, stay at the surface of the water. Therefore, they are able to view most things beneath them, including SCUBA divers. Therefore, snorkelers may evaluate SCUBA divers as more unacceptable than snorkelers because divers could potentially be within their view. The presence of divers may prevent snorkelers from observing other things, such as coral or fish.

SCUBA diving allows humans to remain underwater at various depths for long periods of time. SCUBA divers may not be aware of what is at the surface of the water while they focus on what is at and below their depth. Once SCUBA divers are underwater, they are among other SCUBA divers and may not even see snorkelers. Thus, SCUBA divers also evaluate snorkelers as more acceptable than other SCUBA divers.

6.0 CONCLUSION

From a managerial standpoint, it is important to study the norms of recreationists who share resources in order to manage for individual recreation groups. If norms are violated and unacceptable encounter levels are experienced, the possibility for conflict may increase. However, SCUBA divers and snorkelers were consistent in their evaluations of each recreation group, which suggests that perhaps these recreationists can be managed collectively.

While norms research is important, it is done in vain if the results cannot be easily conveyed. The PCI₂ model graphically displays the results of norms studies, acceptability levels, and consensus, facilitating interpretation and communication.

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NORM STABILITY AT ALCATRAZ ISLAND: EFFECTS OF TIME AND CHANGING CONDITIONS

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Abstract.—Research suggests that visitors often have norms about the resource and social conditions acceptable in a park and that understanding such norms can be useful for park management. Most studies of norms use data from cross-sectional surveys, and little is known about how norms may change over time. To explore this issue, we conducted a study in 2007 to determine whether norms for the number of people-at-one-time in the prison cellhouse at Alcatraz Island, California, had changed since a similar survey in 1998. We conducted an on-site, self-administered visitor survey using a questionnaire identical to the one used in 1998 and similar sampling procedures. The survey produced 453 usable questionnaires and yielded a response rate of 83 percent. There were few substantive differences in findings between the two studies. The findings are generally consistent with results from other research.

1.0 INTRODUCTION AND LITERATURE REVIEW

Contemporary park and outdoor recreation management frameworks, including Visitor Experience and Resource Protection (National Park Service 1997), require identification of indicators of quality and establishment of standards of quality (Manning 2007). Indicators of quality are measurable, manageable variables that help define the quality of natural resources and the visitor experience. Standards of quality define the minimum acceptable condition of indicator variables. Research suggests that visitors often have norms about the resource and social conditions acceptable in a park or related area, and that such norms can be useful as a means of formulating indicators and standards of quality (Manning 2007).

Most studies of visitor norms use data from cross-sectional surveys (Kuentzel and Heberlein 2003). Consequently, we do not know much about how normative standards may change over time. A dramatic or unpredictable change in recreation-related norms over time would diminish their utility for deriving standards and for long-term management of parks and outdoor recreation (Kim and Shelby 2008). Therefore, norm stability is an important issue for park and outdoor recreation management and research.

Studies of norm stability have found mixed results. A 1977 study of boaters on the Rogue River, Oregon, was replicated in 1984 (Shelby et al. 1988). There was no statistically significant difference for the maximum acceptable number of river encounters. However, camp encounter norms were significantly higher or more tolerant in the latter study. A similar study in three wilderness areas over a longer interval found few clear, consistent trends in tolerance for inter-group contacts (Cole et al. 1995). A 1978 study of hiking encounter norms in the wilderness of Denali National Park, Alaska, was replicated in 2000 and found fairly stable norms over this 22-year period (Bacon et al. 2003). A longitudinal study of boaters at Apostle Islands National Lakeshore, Wisconsin, found substantial changes in crowding-related norms from 1975 to 1985, but no substantial changes from 1985 to 1997 (Kuentzel and Heberlein 2003). Two other studies found substantial stability in normative standards of recreation visitors over time, but these studies covered only 2 to 3 years (Manning et al. 1999, Kim and Shelby 2008). Kim and Shelby (2008) found that zero- and single-tolerance norms tended to be stable over time. They attribute the greater stability to greater consensus or “crystallization,” which results in greater norm stability.

2.0 METHODS

Alcatraz Island is part of Golden Gate National Park in San Francisco, California; a famous federal prison facility operated on the island from 1934 to 1963. Today, the National Park Service (NPS) manages and conducts tours

of Alcatraz Island, including the prison itself. The NPS lengthened the prison cellhouse tour slightly between 1998 and 2007.

The current study was conducted on 10 randomly selected days in July and August of 2007 to determine whether normative standards of quality for the number of people-at-one-time in the prison cellhouse at Alcatraz Island had changed since a similar survey was conducted in 1998 (Manning et al. 2002). Both studies involved an on-site, self-administered visitor survey with identical questions measuring crowding-related norms. On each sampling day, a trained interviewer approached randomly selected visitors who were preparing to depart from Alcatraz Island and requested their participation in the survey. Visitors who agreed to participate received a copy of the questionnaire and were asked to complete it as they returned to San Francisco. The 2007 survey produced 453 usable questionnaires and yielded a response rate of 83 percent.

3.0 FINDINGS

The survey asked respondents what they enjoyed most about their trip to Alcatraz Island. In 2007, nearly two-thirds (61.8 percent) reported that they most enjoyed the cellhouse audio tour; this answer was by far the most commonly reported response. These findings are very similar to 1998 (when 75 percent most enjoyed the cellhouse audio tour) and show that the audio tour is an especially important indicator of the quality of the visitor experience.

The 1998 and 2007 surveys also measured normative standards of quality for the number of visitors in the prison cellhouse at Alcatraz. The survey included a series of questions about respondents' standards of quality with respect to the number of visitors on Michigan Avenue, an important location in the prison cellhouse. First, respondents were asked whether they had visited the prison cellhouse during their trip to Alcatraz Island. Virtually all respondents (99.5 percent) had visited Michigan Avenue in both the 1998 and 2007 surveys. Respondents who had visited Michigan Avenue were shown a series of six photographs (Fig. 1) depicting a range of visitor use on Michigan Avenue.

Table 1.—Mean and median acceptability* of use levels

Use Level	Mean Acceptability Rating 2007	Mean Acceptability Rating 1998
Photo 1 - 10 People	3.54	3.24
Photo 2 - 22 People	3.35	3.11
Photo 3 - 34 People	2.40	2.31
Photo 4 - 46 People	-0.01	-0.20
Photo 5 - 58 People	-1.89*	-2.09
Photo 6 - 70 People	-3.00	-3.04

* Scale of -4 ("Very Unacceptable") to +4 ("Very Acceptable")

The levels of use depicted in the photographs ranged from 10 to 70 people. Respondents were asked to rate the acceptability of each photograph on a scale from -4 ("Very Unacceptable") to +4 ("Very Acceptable"). Table 1 reports the mean acceptability rating for each photograph for both the 1998 and 2007 surveys. The mean acceptability rating in the 2007 survey ranged from -3.00 for the photograph depicting 70 people on Michigan Avenue to 3.54 for the photograph depicting a use level of 10 people. Mean acceptability ratings for each photograph were very similar across the two surveys and no significant differences were found.

Figure 2 presents the social norm curve derived from the mean acceptability ratings for each photograph. As the norm curve illustrates, Alcatraz Island visitors consider a use level of approximately 46 people to be the threshold of acceptability. Use levels of less than 46 people are, on average, considered acceptable, and use levels of greater than 45 people are, on average, considered unacceptable. There is virtually no difference between the 1998 and 2007 surveys in the threshold of acceptability. Alcatraz Island visitors in 1998 considered a use level of approximately 44 people to be the threshold of acceptability.

Several questions asked respondents to select the photograph that showed the level of use they would prefer to experience on Michigan Avenue, the number of visitors they typically saw, and the highest level of use the NPS should allow (Table 2). Respondents also had the option to indicate that the NPS should not restrict the number of visitors allowed in the prison cellhouse.



Photo 1 - 10 People



Photo 2 - 22 People



Photo 3 - 34 People



Photo 4 - 46 People



Photo 5 - 58 People



Photo 6 - 70 People

Figure 1.—Study photographs.

Respondents preferred an average of 25.4 visitors on Michigan Avenue. The maximum number of visitors that respondents thought the NPS should allow averaged 44.0. However, this number is underestimated to some degree because 20 respondents indicated that none of the photographs showed a use level high enough to limit use in the cellhouse, and 11 respondents reported that the NPS should not limit use of the cellhouse. Finally, the number of visitors typically seen by respondents averaged 38.2, slightly fewer than in 1998 (40.7). These values did not differ significantly from 1998 survey values.

4.0 DISCUSSION AND CONCLUSIONS

The study findings lead to two primary conclusions. First, the number of people at one time on Michigan Avenue is a good indicator of quality of the visitor experience on Alcatraz Island since nearly all visitors take the prison cellhouse tour and feel that it is the highlight of their visit. However, there are indications that visitors are concerned with growing use levels in the cellhouse. Visitor perceptions of current use levels in the cellhouse are approaching the maximum number of people judged acceptable, meaning that the cellhouse may be reaching

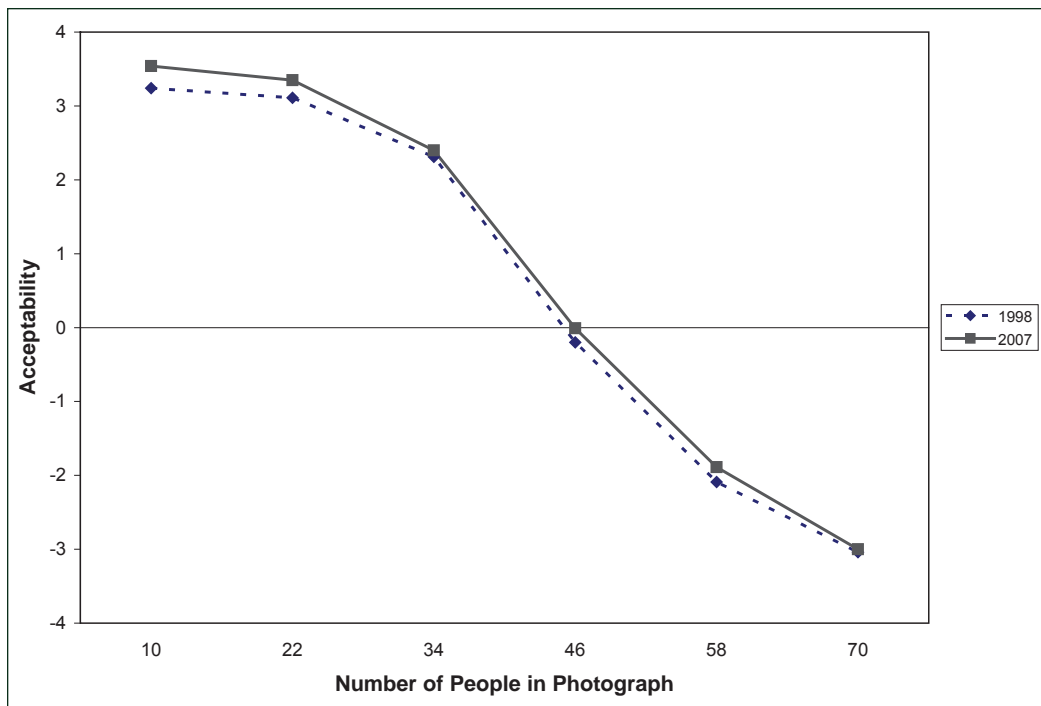


Figure 2.—Social norm curve for number of people at one time in the cellhouse.

Table 2.—Standards of quality for different evaluative dimensions

Evaluative dimension	2007*	1998*
Preference	25.4	25.1
Acceptability	45.9	45.0
Management action	44.0	43.9
Typically seen	38.2	40.7

* Average number of people

capacity and may need further management, such as reservations for the cellhouse tour, or use limits.

Second, normative standards for this indicator seem to be very stable. Few substantive differences in normative standards occurred between the present study and the identical study conducted in 1998. These findings are consistent with results from other studies that found that single-tolerance norms, like the ones measured in this study, tend to be stable over time (Bacon et al. 2003, Kim and Shelby 2008). Additionally, even with minor changes to the format and length of the cellhouse tour at Alcatraz, the normative standard for the number of people-at-one-time in the cellhouse has remained stable. This consistency implies that managers can confidently use normative standards for long-term management.

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PEDESTRIAN LEVELS OF SERVICE (LOS) AT MUIR WOODS NATIONAL MONUMENT (CALIFORNIA): AN INTRODUCTION TO MULTI-MODAL LOS FOR PARKS AND PROTECTED AREAS

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Abstract.—Historically, transportation planning and management have been guided largely by principles of efficiency. Specifically, the Transportation Research Board has utilized a levels of service (LOS) framework to assess quality of service in terms of traffic congestion, speed and travel time, and maximum road capacity. In the field of park and outdoor recreation management, on the other hand, indicators and standards of quality have emerged as an important conceptual framework for assessing the quality of visitor experience. This contemporary management-by-objectives approach provides a standard of quality based upon minimum acceptable conditions. While LOS is an effective utilitarian approach to transportation planning, application of an indicators-and-standards framework could prevent unacceptable negative impacts to park resources and the visitor experience. Past studies in Acadia National Park (Maine), Blue Ridge Parkway (Virginia), and Muir Woods National Monument (California) provide a means for exploring this conceptual bridge.

1.0 BACKGROUND

Transportation has been an integral element of visitor experience since the first National Parks were established. At the time of their inception, National Parks were promoted as tourist destinations to increase railroad ridership and broaden Western expansion (Runte 1997).

With the advent of the automobile, park visitation rates increased; today automobiles remain the primary means of getting to and experiencing National Parks. However, innovative transportation planning has led to the emergence of public transit systems in Acadia (Maine), Grand Canyon (Arizona), Yosemite (California), Zion (Utah), and other National Parks (National Park Service 1999). Given the inherent relationship between transportation and visitor experience, how can transportation be managed best in parks and related contexts?

This paper explores conceptual frameworks from both transportation and recreation fields of study in order to propose a new means of guiding transportation management in parks and protected areas. U.S. Department of Transportation (DOT) and National Park Service (NPS) objectives are used to construct a rational basis for the proposed framework. Muir Woods National Monument (California) provides the backdrop for this examination.

2.0 AGENCY OBJECTIVES

The DOT was established in 1966 with the following mission: to “[s]erve the United States by ensuring a fast, safe, efficient, accessible and convenient transportation system that meets our vital national interests and enhances the quality of life of the American people, today and into the future.” To carry out this mandate, the department focuses primarily on such variables as speed, safety, efficiency, accessibility, and convenience. The latter half of the statement considers vital national interests and quality of life for current and future generations. As parks may be considered of vital national interest and contribute to the quality of life of the American people, what is an appropriate measure of effectiveness for transportation plans within parks and protected areas?

The NPS Organic Act of 1916 offers insight into this issue. The Act states that the National Park Service’s

mission is “...to promote and regulate the use of the... national parks...which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” While the definitive link between agency objectives is consideration of future generations, the NPS focuses on a different set of critical variables in its management regime. National Parks must be managed for conservation of scenery, natural and historic objects, and wildlife as well as for visitor enjoyment.

As transportation provides a vital link between people and place, it is important that the two agencies blend their goals with respect to transportation. How can the DOT and the NPS cooperate in ways that allow each agency to address its respective objectives?

3.0 LEGISLATIVE INTENT AND FEDERAL REGULATIONS

Legislative intent and the Code of Federal Regulations (CFR) call for innovative and interdisciplinary approaches to transportation planning within parks and protected areas. In 1982, the Surface Transportation Assistance Act created the Federal Lands Highway Program (FLHP), including the Park Roads and Parkways, Refuge Roads, and Public Highways Program. Its mission statement combines variables from both the NPS Organic Act and DOT’s mission: to “[i]mprove transportation access to and through Federal and Tribal lands through stewardship of FLH programs by providing balanced, safe, and innovative roadways that blend into or enhance the existing environment.” Accessibility and safety are part of DOT’s mission, while environmental considerations are part of the NPS mission. In 1983, the NPS and the FLHP established their first formal partnership in a Memorandum of Agreement (MOA).

A 1997 Memorandum of Understanding supplemented the 1983 MOA. It established the overarching goal of creating a mutually beneficial relationship to improve transportation in, and approaching, NPS facilities through five activities: 1) developing and implementing innovative transportation plans; 2)

establishing personnel exchange and information sharing systems; 3) establishing interagency project agreements for developing and implementing transportation improvement initiatives; 4) developing innovative transportation planning tools; and 5) developing innovative policy, guidance, and coordination procedures to implement safe and efficient transportation systems that are compatible with the protection and preservation of the NPS’ cultural and natural resources. As a result, the NPS began development of the Alternative Transportation Program and published the NPS transportation planning guidebook in 1999.

The Transportation Equity Act for the 21st Century (TEA-21, 1998) and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU 2005) both promote concepts in NPS regulations. TEA-21 requires the DOT and the Department of Interior, which houses NPS and other federal land managing agencies, to conduct a comprehensive study of transportation needs on federal lands. It also introduced a requirement to develop planning procedures for congestion management systems (CMS). SAFETEA-LU initiated funding for multi-modal projects including mass transit, bicycle and pedestrian traffic, ferry facilities, visitor facilities, and intermodal terminals. These guiding legislative Acts have in turn created pragmatic implications through the CFR.

Multi-modal transportation systems have been proposed as a solution to congestion, and thus warrant research. The CFR explicitly states that “consideration shall be given to strategies that promote alternative transportation systems, reduce private automobile travel, and best integrate private automobile travel with other transportation modes.” It also suggests that alternative mode studies should be components of CMS and that methods for evaluating and monitoring the effectiveness of multi-modal transportation systems should be developed. When reflecting on the results of CMS, the NPS must also consider congestion mitigation strategies that “add value (protection/rejuvenation of resources, improved visitor experience) to the park.” The overt use of the words “visitor,” “experience,” “resources,” and “protection” illustrates the need to consider the Visitor Experience Resource Protection (VERP), a carrying-

capacity framework utilized by the NPS (National Park Service 1997, Manning 1999). CFR goes on to name a conceptual framework from traditional transportation planning that may be used to identify and document measures of congestion: levels of service (LOS). At this nexus of VERP and LOS is an innovative framework for transportation planning for parks and protected lands (CFR, Title 23 970.214).

4.0 INDICATORS AND STANDARDS OF THE QUALITY OF THE VISITOR EXPERIENCE

Indicators and standards are a fundamental focus of contemporary carrying capacity frameworks for parks and protected lands. Indicators are measureable, manageable variables affected by visitor-use levels and/or behaviors. These variables are important in influencing the quality of the visitor experience. Standards of quality define the minimum acceptable condition of indicator variables and are often derived from the normative standards of visitors and other stakeholders regarding the condition that should be maintained in National Parks and related areas. Normative standards may ultimately be codified into administrative rules and regulations, public policy, or even law. “Carrying capacity” can be defined as the level and type of recreation use that can be accommodated in a park or related area without violating standards for relevant indicator variables. The formulation of indicators and standards are critical elements of the VERP framework (Manning 2007).

VERP consists of nine elements and lends itself to cooperative planning processes. While VERP selects indicators and specifies standards, it also considers interdisciplinary approaches to project planning and integrates public involvement to illuminate salient indicators and standards. Along with analysis of existing park resources and visitor use levels, resource and social indicators may be monitored and ultimately managed for a high quality visitor experience (Manning 2007). Combined with the aforementioned legislative and regulatory intent, VERP thus becomes a critical element in transportation planning for parks and protected lands. But how does VERP coincide with conventional transportation frameworks?

5.0 HIGHWAY CAPACITY MANUAL AND LEVELS OF SERVICE

LOS is a carrying capacity framework from the Transportation Research Board’s Highway Capacity Manual (HCM) that has guided transportation planning across the United States. LOS is “a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience.” The HCM rates LOS with a letter system (A through F) where ‘A’ represents free-flowing traffic and ‘F’ is total gridlock. The HCM provides specific LOS measurements for multiple modes of transportation and is a critical element of transportation planning (Transportation Research Board 2000).

In the case of pedestrian walkways, LOS uses both spatial (in persons per meter squared) and temporal (in persons per minute per meter) flow rates. The HCM also provides a visual representation of LOS for pedestrian walkways (Fig. 1). The LOS was created, in part, to make the presentation of results easier to understand (Transportation Research Board 2000), and clear visual representations build upon a vital element of policy formulation – transparency in democratic decision-making (Barber 2000, Fischer 2000, Beierle and Cayford 2002). Again, concepts from VERP and LOS converge to create an innovative approach to transportation planning within parks and protected areas.

6.0 METHODOLOGY AND INTEGRATING FRAMEWORKS

Visual research methods (VRMs) provide an adaptable methodology for working in site-specific contexts and promote transparency in the planning process by illustrating alternatives to the public (i.e., the users of the system) from the early stages of the project (Manning 2007). By making the presentation of results easier to understand, VRMs achieve the goals of the original intent of LOS (Transportation Research Board 2000). VRMs have been utilized with a Limits of Acceptable Change (LAC) framework to manage for optimal visitor enjoyment (Stankey et al. 1985, Manning 2007).

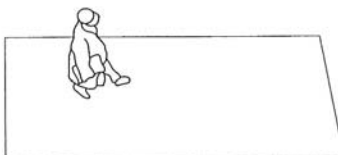
At Muir Woods National Monument, VRMs were used to measure normative standards for crowding on

EXHIBIT 11-8. PEDESTRIAN WALKWAY LOS

LOS A

Pedestrian Space > 60 ft²/p *Flow Rate* ≤ 5 p/min/ft

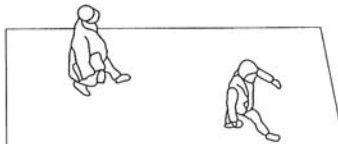
At a walkway LOS A, pedestrians move in desired paths without altering their movements in response to other pedestrians. Walking speeds are freely selected, and conflicts between pedestrians are unlikely.



LOS B

Pedestrian Space > 40–60 ft²/p *Flow Rate* > 5–7 p/min/ft

At LOS B, there is sufficient area for pedestrians to select walking speeds freely, to bypass other pedestrians, and to avoid crossing conflicts. At this level, pedestrians begin to be aware of other pedestrians, and to respond to their presence when selecting a walking path.



LOS C

Pedestrian Space > 24–40 ft²/p *Flow Rate* > 7–10 p/min/ft

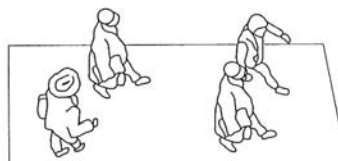
At LOS C, space is sufficient for normal walking speeds, and for bypassing other pedestrians in primarily unidirectional streams. Reverse-direction or crossing movements can cause minor conflicts, and speeds and flow rate are somewhat lower.



LOS D

Pedestrian Space > 15–24 ft²/p *Flow Rate* > 10–15 p/min/ft

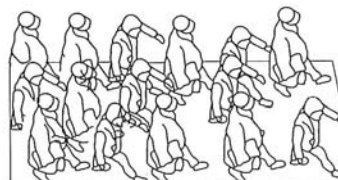
At LOS D, freedom to select individual walking speed and to bypass other pedestrians is restricted. Crossing or reverse-flow movements face a high probability of conflict, requiring frequent changes in speed and position. The LOS provides reasonably fluid flow, but friction and interaction between pedestrians is likely.



LOS E

Pedestrian Space > 8–15 ft²/p *Flow Rate* > 15–23 p/min/ft

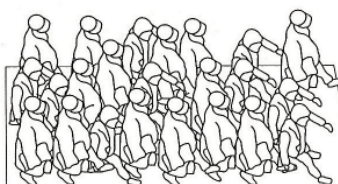
At LOS E, virtually all pedestrians restrict their normal walking speed, frequently adjusting their gait. At the lower range, forward movement is possible only by shuffling. Space is not sufficient for passing slower pedestrians. Cross- or reverse-flow movements are possible only with extreme difficulties. Design volumes approach the limit of walkway capacity, with stoppages and interruptions to flow.



LOS F

Pedestrian Space ≤ 8 ft²/p *Flow Rate* varies p/min/ft

At LOS F, all walking speeds are severely restricted, and forward progress is made only by shuffling. There is frequent, unavoidable contact with other pedestrians. Cross- and reverse-flow movements are virtually impossible. Flow is sporadic and unstable. Space is more characteristic of queued pedestrians than of moving pedestrian streams.



Source: Adapted from Fruin (2).

Figure 1.—Pedestrian walkway LOS diagram from the Highway Capacity Manual (Transportation Research Board 2000).

Table 1.—Normative standards for Muir Woods National Monument survey

	N	Photo (PPV) number (mean)	Equivalent Level of Service (ped/m ²)	Level of Service category
Acceptability	123-124	18.3	3.06	C
Preference	116	11.3	4.96	B
Displacement	101	39.4	1.42	D
Management action	101	23.6	2.37	C
Typically seen	115	13.6	4.12	B

pedestrian walkways. Research participants first viewed a set of computer-edited study photographs that illustrated a range of persons-per-view (PPV) on the park's primary walkway. Respondents were then asked to rate the acceptability of the photographs based on the number of visitors shown and to select the photographs that best represented other evaluative dimensions of preference, management action, and displacement (Park Studies Laboratory 2006). Specifically, respondents were asked to indicate how many PPV correspond with an ideal experience, how many PPV should be allowed before management actions are taken to regulate the number of users allowed on the walkway at one time, and at which point visitors would stop using the walkway based on an unacceptable number of PPV. Finally, respondents were asked to select the photograph that best represented the level of use during their visit. The results of the survey are in Table 1.

7.0 RESULTS

The results of this study provide pragmatic information for administrative decisionmaking. Furthermore, they can be presented in terms of both recreation and transportation frameworks. Table 1 illustrates PPV in terms of LOS. For each dimension, the mean number of PPV was divided into pedestrians per meter squared based upon the length of the boardwalk and number of users shown in the photographs. This calculation demonstrates the numerical pedestrian LOS that is also represented in terms of the letter-based categorical LOS. The same results are illustrated with a social norm curve in Figure 2.

Overlaying an LOS framework creates a Composite Level of Service that incorporates acceptable levels of

change in regards to visitor experience (Fig. 3). The data demonstrate that eight PPV is a highly acceptable condition. In terms of traditional transportation planning, this condition equates to high-flow and congestion-free traffic or LOS A. At the opposite end of the spectrum, 51 PPV on the boardwalk equates to LOS E, or an unacceptable impact upon visitor experience. Ultimately, managers may wish to accommodate between 12 and 19 PPV on the boardwalk as that range coincides with the neutral point of acceptability on the norm curve. This strategy can help avoid displacement of visitors from public lands and help maintain a visitor experience of acceptable quality.

8.0 CONCLUSION

For nearly 30 years, the NPS and DOT have worked cooperatively toward a sustainable framework for transportation systems within and surrounding parks and protected areas. Recently CMS and multi-modal planning regimes have emerged and been promoted through legislation and regulation. As a pragmatic means of measuring, monitoring, and ultimately managing transportation systems, the DOT and NPS may use this planning framework, integrating VERP and LOS, to satisfy the missions of both agencies.

Of course, this paper explores only pedestrian walkways. Legislative intent and the CFR strongly emphasize multi-modal transportation systems as a solution to congestion in national parks. Further research could investigate appropriate LOS measures for bicycle/pedestrian pathways, mass transit, ferries, and intermodal facilities, as well as roadways within and surrounding parks and protected areas.

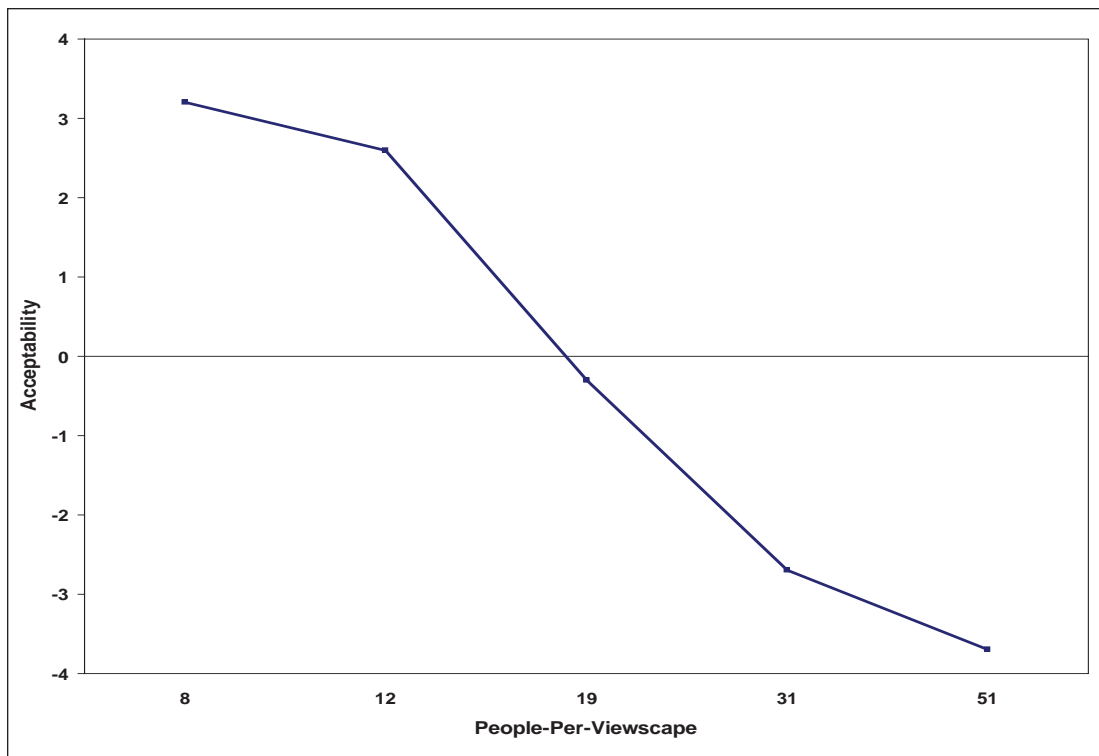


Figure 2.—Social norm curve of persons-per-viewscape (PPV) in the walkway study at Muir Woods National Monument.

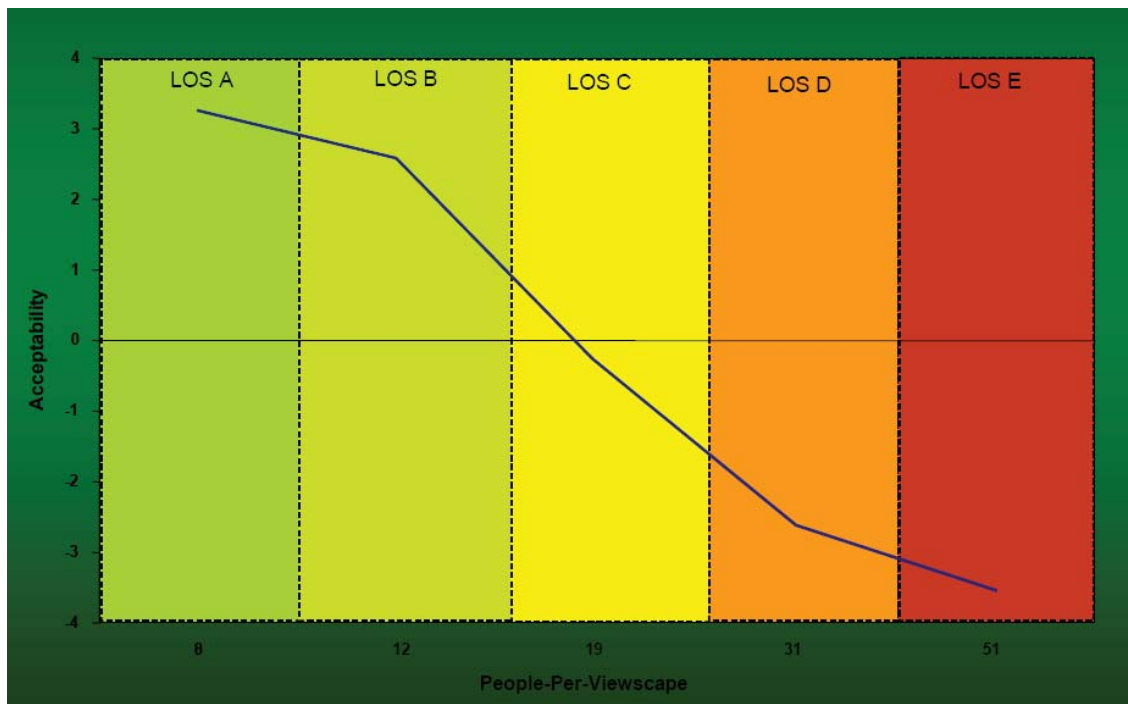


Figure 3.—Social norm curve from Figure 2 with LOS category overlays.

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TOURISM TRENDS AND CHALLENGES

ATTENDANCE MOTIVATIONS AND VISITOR SEGMENTS WITHIN A UNIVERSITY AGRICULTURAL FESTIVAL

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Abstract.—Festivals attract a variety of visitors driven by a complex set of motivations. The objective of this study was to identify and classify motivations for attending the South Farm Showcase (SFS), a university-based agricultural festival in Missouri. The study further developed a motivation-based segmentation of festival visitors and examined their distinct characteristics.

Analysis identified two motivation factors (*Fun and Entertainment* and *Theme Identity*) and two types of visitors (*Entertainment Seekers* and *Institutional Loyals*). Entertainment Seekers and Institutional Loyals differ in their socio-economic characteristics and in their leisure and tourism preferences. Marketing, management, and academic implications of these findings are presented.

1.0 INTRODUCTION

The South Farm Showcase (SFS) is a 1-day festival that the College of Agriculture, Food, and Natural Resources at the University of Missouri (MU-CAFNR) has hosted annually since 2006. The festival's purpose is to connect MU-CAFNR with the local community and to involve local people in – and educate them about – MU-CAFNR research efforts. The 2008 SFS received about 2000 visitors and offered a variety of recreational activities and educational displays.

Research on festival attendance motivations finds that attendance is driven by a complex set of goals, the most recurrent of which are socialization, escapism, and gregariousness (Backman et al. 1995, Crompton and McKay 1997). However, this topic has not been fully explored (Getz 2008). Recent studies suggest that further

examination is needed to identify motivations associated with the uniqueness of festivals (Nicholson and Pearce 2001, Schofield and Thompson 2007). This research angle is especially relevant to university-based agricultural festivals, which have received little attention from researchers (Barbieri et al. 2009).

The SFS is distinctive because of its university-community bridging purpose, agricultural focus, and edutainment nature. This study aims to identify the motivations behind attendance at the SFS. Recognizing that festivals attract visitors of different characteristics, this study developed a motivation-based segmentation of attendees and identified different socio-economic, lifestyle, and tourism characteristics associated with those segments.

2.0 METHODS

The sample for this study was randomly selected attendees of the 2008 SFS. The researcher/interviewer explained the study purpose to each participant and asked for an email address for future on-line survey participation. Three hundred twenty-six valid email addresses were obtained. Only 26 people declined to participate. The online survey was launched 4 days after the festival and remained open for 27 days. Three electronic reminders were sent to nonrespondents. The survey asked about SFS attendance motivations, festival behavior, lifestyle information, and socio-demographics. A total of 251 surveys were completed (77-percent response rate). Of these, 231 cases were included for analysis after we excluded respondents who were associated with the SFS event (e.g., volunteers).

The survey included attendance motivations selected from the events literature or constructed to reflect the SFS's purposes and goals (for example, "learn about agriculture and related activities" or "I like to attend festivals"). Respondents ranked each motivation using a five-point Likert scale rank anchored in 1 (not important) and 5 (extremely important). A principal factor analysis with varimax rotation was performed on

the rankings of 12 attendance motivations. Eigenvalues greater than 1 and loadings greater than 0.50 were used to select principal factors. Then, a K-means cluster analysis was performed over the motivational regression scores in order to segment participants. ANOVA and chi-square tests were used to analyze differences between identified clusters. On another section of the survey, respondents used a five-point Likert scale anchored in 1 (not important) and 5 (extremely important) to rate the importance of 14 culture-, nature-, and agriculture-related attractions and activities on their decisions about pleasure travel destinations.

3.0 RESULTS AND DISCUSSION

Respondents were preponderantly female (67.4 percent) and between 26 and 45 years old (68.2 percent). More than a third (36.3 percent) of respondents had an advanced education degree and almost three-quarters (73.5 percent) had at least a 4-year college degree. The majority was employed full-time (70.1 percent) and had a household income of at least \$50,000 (74.5 percent). The data suggest that SFS visitors are in the early stage of their family life cycle; a high proportion of visitors lived with children younger than 7 years (58.3 percent) or between 7 and 12 (33.0 percent). The majority (70.5 percent) lived in an urbanized area (population $\geq 50,000$). Consistent with the location of the festival (Columbia, MO) and the strong university presence in this town, a high proportion of respondents (65.7 percent) were affiliated in some way with MU.

Results confirm that a complex set of motivations drove visitors to attend the festival (Table 1). The most important motivations for attending the SFS were related to the recreational aspect of festivals: “the variety of entertainment and activities offered” (mean=3.96), “enjoy a day on a farm” (mean=3.84), and “the educational activities for children” (mean=3.83). The least important reason was to learn about MU research efforts (mean=2.83). In the analysis, attendance motivations were reduced to fewer dimensions to facilitate their application in marketing strategies (e.g., advertising, positioning) and planning activities. The varimax-rotated factor analysis resulted in two factors accounting for 74.1 percent of the variance in the data. Cronbach’s

alpha coefficients were high ($\alpha \geq 0.80$), indicating overall and within-factor internal consistency. The factors were labeled based on the motivations that loaded on them: *Theme Identity* (F1) and *Fun and Entertainment* (F2). The motivation related to “educational activities for children” (mean=3.83) did not load on any factor and was dropped from further analysis.

Theme Identity (F1) is associated with several attributes that shape this festival’s distinctiveness, including appreciation of MU outreach efforts and learning about agriculture. This factor explained 42.8 percent of the variance for these data and had an eigenvalue greater than 3 (Cronbach’s $\alpha = 0.82$). The second factor, *Fun and Entertainment* (F2), is related to the recreational nature of festivals, including the variety of recreation and entertainment activities offered at SFS. It explained 22.8 percent of variance and had an eigenvalue close to 2 (Cronbach’s $\alpha = 0.80$). A composite mean was calculated for each motivational factor (Factor Mean Score [FMS]) by averaging the means of the variables loaded in each factor. Overall, the motivations related to the recreational aspect of the SFS have a larger influence on attendance (FMS-2=3.63) than do the motivations related to the SFS purpose (FMS-1=3.22).

K-means cluster analysis was performed over the factor scores and resulted in two clusters (Table 2). Cluster 1 was named *Entertainment Seeker* (n=120; 52 percent) because people in this category had a relatively high cluster center in the *Fun and Entertainment* factor (.32) and a negative center in the *Theme Identity* factor (-.68). Cluster 2 was named *Institutional Loyal* (n=108; 48 percent) because people in this category had a high final cluster center in the *Theme Identity* factor (.75) and a negative center in the *Fun and Entertainment* factor (-.34). Using the FMS previously calculated, we found that the motivations related to the Theme Identity factor were significantly more important ($p < .001$) for the *Institutional Loyal* (mean=3.81) than for the *Entertainment Seeker* (mean=2.66). Conversely, the motivations related to the Fun and Entertainment factor were significantly more important ($p = .003$) for the *Entertainment Seeker* (mean=3.79) than for the *Institutional Loyal* (mean=3.47).

Table 1.—Rotated factor matrix of the motivations driving SFS attendance

Factors and Items (n=230)	Mean ^a	Factor Loadings	Explained Variance (%)	Eigenvalue
Theme Identity (F1) ($\alpha=.82$) ^b			42.82	3.43
Support MU outreach efforts	3.18	.855		
Learn about MU research efforts	2.83	.829		
Learn about agriculture and related activities	3.23	.776		
The uniqueness of the South Farm Showcase	3.59	.710		
Factor Mean Score 1 (FMS – 1)	(3.22)			
Fun and Entertainment (F2) ($\alpha=.80$)			22.77	1.82
Enjoy a day on a farm	3.84	.825		
Variety of entertainment and activities offered	3.96	.813		
It is something different to do	3.60	.787		
I like to attend festivals	3.13	.692		
Factor Mean Score 2 (FMS – 2)	(3.63)			
Total Variance Explained			74.01	

^a Measured on a 5-point Likert scale where 1="not important"; 3="important"; and 5="extremely important"

^b Cronbach's alpha reliability coefficients for domains. Overall reliability: $\alpha=.805$.

Table 2.—Final cluster center and factor mean scores of the motivations driving SFS attendance

	Entertainment Seekers (n=120; 52%)	Institutional Loyals (n=108; 48%)	Sig.
Final Clusters Center			
Theme Identity	-.67972	.75176	$F=240.936, p<.001$
Fun & Entertainment	.31699	-.34259	$F=27.765, p<.001$
Factor Mean Scores			
Theme Identity (FMS-1)	2.66	3.81	$F=240.936, p<.001$
Fun & Entertainment (FMS-2)	3.79	3.47	$F=27.765, p=.003$

Statistical tests revealed significant differences in the socio-economic profiles, event behaviors, and recreational and tourism preferences of people in the different clusters. The proportion of respondents affiliated with MU or involved in agriculture was not significantly different among the *Entertainment Seekers* (67.2 percent and 33.3 percent, respectively) and the *Institutional Loyals* (63.9 percent and 33.4 percent, respectively). Overall, the *Entertainment Seekers* were younger and in earlier family-life stages than *Institutional Loyals* (Table 3). Measured on a 6-point ordinal scale¹, the *Entertainment Seekers* were on average less than 36 years old, while the *Institutional Loyals* were on average more than 36 years old ($F=6.43, p=.012$). The *Entertainment Seeker* group had a larger proportion of respondents

living with children younger than 6 years old ($\chi^2=11.65, p<.001$) and a smaller proportion of retirees from another profession ($\chi^2=5.83, p=.015$). No differences were found in the gender and household annual incomes of the respondents in the two groups.

We found very few significant differences in festival behaviors between clusters. A larger proportion of the *Entertainment Seeker* cluster (90.3 percent) attended the SFS accompanied by their children compared to the *Institutional Loyal* cluster (78.1 percent; $\chi^2=5.90, p=.015$); these results are consistent with the early family-life cycle stage of the first group as already reported (Table 4). An important finding for festival programming purposes is that *Institutional Loyals* spent on average

Table 3.—Comparison of socio-economic demographics between the Entertainment Seekers and the Institutional Loyals

	Entertainment Seekers (52%)	Institutional Loyals (48%)	All (100%)	Sig.
Gender				
Female	68.9	67.9	68.4	<i>Not Sig.</i>
Male	31.1	32.1	31.6%	
Age				
Age (mean) ^a	2.85	3.21	3.02	$F=6.43, p=.012$
Socio-Economic Indicators				
Education level (mean) ^b	5.18	4.73	4.97	$F=5.43, p=.021$
Annual household income (mean) ^c	4.53	4.23	4.40	<i>Not Sig.</i>
Family Life-cycle Indicators				
Small kids living at home (<6 yrs)	69.0%	46.0%	58.3%	$\chi^2=11.65, p<.001$
Kids living at home (<12 yrs)	29.3%	37.0%	32.9%	<i>Not Sig.</i>
Full-time employees	75.8%	63.0%	69.7%	$\chi^2=4.46, p=.025$
Retired from a previous job/profession	2.5%	10.2%	6.1%	$\chi^2=5.83, p=.015$
Residence Location ^d				
Distance from a 50,000-pop. city	1.58	2.05	1.80	$F=6.17, p=.014$

^a Measured on a 6-point ordinal scale, where 1="25 years or less"; 2="26-35 years"; 3="36-45 years"; 4="46-55 years"; 5="56-65 years"; and 6="66 years or older".

^b Measured on a 7-point ordinal scale, where 1="Less than high school"; 2="High school graduate"; 3="Some college"; 4="Two-year college degree"; 5="Four-year college degree"; 6="Masters degree"; and 7="Doctorate or professional".

^c Measured on an 8-point ordinal scale, where 1="Less than \$25,000"; 2="\$25,000-\$34,999"; 3="\$35,000-\$49,999"; 4="\$50,000-\$74,999"; 5="\$75,000-\$99,999"; 6="\$100,000-\$149,999"; 7="\$150,000-\$199,999"; and 8="\$200,000 or more".

^d Measured on a 6-point ordinal scale, where 1="I live in a 50,000-pop. city"; 2="Less than 5 miles"; 3="5-9 miles"; 4="10-29 miles"; 5="30-59 miles"; and 6="60 miles or more".

significantly more (\$21.00) at the festival than their counterparts (\$6.59; $p=.036$). No differences emerged in other event behavior indicators, including previous attendance, distance traveled to and hours stayed at the SFS, and party size.

The survey also asked respondents about their general leisure activities and interests. Overall, the *Entertainment Seekers* participated in a wider variety of leisure activities than their counterparts, maybe because of their younger relative ages and earlier family life-stage (Table 5). A larger proportion of the *Entertainment Seeker* cluster watched at least 1 hour of TV at home per day (52.5 percent) and had attended at least two festivals (91.6 percent) compared to the *Institutional Loyal* cluster (38.0 percent and 83.2 percent, respectively; $p<.05$). Although live entertainment attendance was very low in both groups, the *Institutional Loyals* attended live sporting events more frequently than their counterparts. This

participation may be associated with supporting MU teams at local sporting events. Both groups had taken approximately three pleasure trips at least 50 miles away from home in the last 12 months. Perhaps because of their broader set of leisure interests, a larger proportion of *Entertainment Seekers* (79.6 percent) than *Institutional Loyals* (62.5 percent; $p=.004$) had taken out-of-state pleasure trips over the previous 12 months.

Both clusters were most interested in visiting attractions or activities related to nature and natural resources, including zoos, gardens, or aquariums (mean=3.77), state or national parks (mean=3.62), and natural landscapes and resources (mean=3.43) (Table 6). Overall, cultural attractions were significantly more influential ($p<.05$) in *Institutional Loyals'* choice of a pleasure travel destination than in *Entertainment Seekers'* decisions. These results were applicable to both live (e.g., customs and ways of living) and built (e.g., historic attractions, sites, or

Table 4.—Comparison of event behavior indicators between the Entertainment Seekers and the Institutional Loyals

	Entertainment Seeker (52%)	Institutional Loyal (48%)	All (100%)	Sig.
Previous Attendance				
First timers	72.5%	68.5%	70.6%	<i>not sig.</i>
Repeat visitors	27.5%	31.5%	29.4%	
Distance Traveled				
Less than 30 miles	95.0%	88.8%	92.0%	<i>not sig.</i>
30 - 59 miles	4.2%	6.5%	5.3%	
60 miles or more	0.8%	4.7%	2.7%	
Hours Stayed				
1 hour or less	1.7%	0.0%	0.9%	<i>not sig.</i>
2 - 3 hours	45.8%	44.4%	45.2%	
3 or more hours	52.5%	55.6%	53.9%	
Party Size				
Mean (in number of people)	3.72	3.52	3.63	<i>not sig.</i>
Party Composition				
Accompanied by their children	90.3%	78.1%	84.7%	$\chi^2=5.90, p=.015$
Accompanied by spouse	60.2%	50.0%	55.5%	<i>not sig.</i>
Accompanied by friends	13.3%	18.8%	15.8%	<i>not sig.</i>
Amount Spent				
Mean (in dollars)	6.59	21.04	13.29	$F=4.47, p=.036$

Table 5.—Comparison of leisure and tourism indicators between the Entertainment Seekers and the Institutional Loyals^a

	Entertainment Seekers (52%)	Institutional Loyals (48%)	All (100%)	Sig.
Home-Based Entertainment (Hrs/day)				
<i>Watching TV</i>				
Less than 1 hour	47.5%	62.0%	54.4%	$\chi^2=4.83, p=.019$
1 hour or more	52.5%	38.0%	45.6%	
<i>Watching Movies</i>				
Less than 1 hour	86.2%	87.6%	86.9%	<i>not sig.</i>
1 hour or more	13.8%	12.4%	13.1%	
Attendance at Live-Entertainment Events ^a				
Live sporting events (mean)	2.19	2.56	2.37	$F=5.95, p=.016$
Live performance (mean)	2.05	2.13	2.09	<i>not sig.</i>
Number of Festivals Attended				
Only South Farm Showcase	8.4%	16.8%	12.4%	$\chi^2=3.68, p=.043$
Two or more festivals	91.6%	83.2%	87.6%	
Tourism Indicators				
Number of pleasure trips (last 12 months)	3.60	3.61	3.61	<i>not sig.</i>
Took out-of-state trips (last 12 months)	79.6%	62.5%	71.4%	$\chi^2=7.80, p=.004$

^a Measured on a 5-point Likert scale, where 1="very rarely"; 3="occasionally"; and 5="very often".

Table 6.—Entertainment Seekers' and the Institutional Loyals' preferred attractions and activities when choosing a pleasure travel destination^a

Types of Attractions and Activities	Entertainment Seekers (52%)	Institutional Loyals (48%)	All (100%)	Sig.
Nature Based Attractions				
Zoos, gardens, or aquariums	3.74	3.80	3.77	<i>Not Sig.</i>
State or National Parks	3.55	3.70	3.62	<i>Not Sig.</i>
Natural landscapes and resources	3.39	3.47	3.43	<i>Not Sig.</i>
Water-based entertainment (e.g., boating)	3.08	3.40	3.23	$F=4.97, p=.027$
Cultural Attractions				
Historic attractions, sites, or places	3.15	3.44	3.29	$F=5.24, p=.023$
Fairs, festivals, or events	3.06	3.07	3.06	<i>Not Sig.</i>
Museums	2.76	3.01	2.88	<i>Not Sig.</i>
Local arts and crafts	2.55	2.98	2.75	$F=10.70, p<.001$
Customs and ways of living	2.55	2.93	2.73	$F=7.35, p=.007$
Libraries, bookstores, or literary events	2.45	2.84	2.64	$F=6.11, p=.014$
Live performances	2.31	2.73	2.51	$F=8.59, p=.004$
Architecture or buildings	2.24	2.72	2.47	$F=14.49, p<.001$
Agriculture-related Attractions				
Agricultural attractions or events	2.50	3.02	2.75	$F=14.93, p<.001$
Local products or foods	2.38	2.95	2.65	$F=14.32, p<.001$

^a Measured on a 5-point Likert scale, where 1="not important"; 3="important"; and 5="extremely important".

places) expressions of culture and heritage. Agriculture-based attractions (e.g., agricultural festivals, local foods) were also significantly more important in the choice of pleasure travel destinations for the *Institutional Loyals* than for the *Entertainment Seekers* ($p<.001$).

4.0 CONCLUSIONS

As suggested in the literature, this study confirmed that festivals attract people with different motivations, including seeking entertainment and supporting a specific institution because of strong institutional identity. Specifically, this study found that diverse motivations drove attendance at a university-based agricultural festival. The nine motivations tested in this study resulted in two motivational factors: *Theme Identity (F1)* which was associated with several distinctive attributes of the SFS; and *Fun and Entertainment (F2)*, which was associated with the types and variety of recreation and entertainment activities offered at the festival. These motivations factors, in turn, pertained to two types of attendees: *Entertainment Seekers*, who were driven by recreational and entertainment opportunities,

and *Institutional Loyals*, who were more driven by unique factors about the SFS and its setting.

It is important for marketers and event planners to identify different attendance motivations and different segments of event attendees so that they can tailor future festival offerings to their visitors' needs and expectations and provide satisfying experiences (Fodness 1994, Lee et al. 2004). This study suggests that SFS organizers need to highlight fun/entertainment and agricultural themes in their promotions and advertising to draw both *Entertainment Seekers* and *Institutional Loyals*. A variety of recreational activities needs to be offered and advertised to attract families with small children while the MU theme needs to be strengthened when targeting a middle-aged clientele.

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The content of this paper reflects the views of the authors(s), who are responsible for the facts and accuracy of the information presented herein.

PLACE MEANINGS

BUILDING SUSTAINABLE COMMUNITIES USING SENSE OF PLACE INDICATORS IN THREE HUDSON RIVER VALLEY, NY, TOURISM DESTINATIONS: AN APPLICATION OF THE LIMITS OF ACCEPTABLE CHANGE PROCESS

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Abstract.—This study explores whether measures of residents' sense of place can act as indicators in the Limits of Acceptable Change (LAC) process to facilitate tourism planning and management. Data on community attributes valued by residents and the associated values and meanings were collected through focus groups with 27 residents in three Hudson River Valley, New York, communities. Data analysis found that strength of sense of place changes over time, as do the meanings and values associated with places. The quantification of sense of place required to establish limits makes it difficult to incorporate evolving place meanings. Therefore, sense of place scales are not indicators that easily conform to the LAC framework. Tourism development proposals that alter places may alter place meanings. Understanding residents' sense of place is the first step in establishing a framework for evaluating such proposals.

1.0 INTRODUCTION

Many rural coastal communities face challenges in maintaining stable local economies and depend on recreation and tourism as a basis for economic viability. Local residents often find that nature-based recreational opportunities, and the local characteristics related to

attractive and livable communities, are marketed to tourists. Residents can identify positive and negative impacts of tourism in their communities (Harrill 2004, Andereck et al.2005). Tourism planning and development can physically alter places of personal value to residents (Hester 1985), damaging the unique appeal of individual communities for both residents and visitors. Therefore, it is critical to identify and sustain community attributes that hold special meaning for residents. Sustainability is defined as the balance among ecological, economic, and social values (Hart 1999). In communities that depend on natural resources for place meanings and tourism, the limits of ecological processes to renew natural resources establish the parameters of sustainability. Sustainable tourism meets the above definition of sustainability and uses a public participation process to inform planning and management decisions (Ionnides 2001, Cole 2006).

1.1 Sense of Place

Identification of place meanings stems from the concept of sense of place. Sense of place is the meaning and emotion humans assign to geographic spaces (Stedman 2003). Sense of place involves awareness about a place and the attributes that differentiate it from other places (Tuan 1980). Historical, cultural, social, ecological, and physical attributes may all contribute to the creation of place meanings.

This study assumes that the three study communities (Beacon, Cold Spring, and Kingston, NY) derive place meanings from at least one shared attribute, the Hudson River. All three municipalities are riverfront communities located in the mid-Hudson Valley. The Hudson River may contribute to distinct place meanings, behaviors, and emotions in each community. For example, in one community the riverfront may serve as a relaxing, park-like setting. In another community, the riverfront may be a busy commercial and recreational venue for boaters.

Stedman (1999) posited that sense of place measures can be operationalized as quantitative indicators of community sustainability, but he emphasized the need to understand underlying meanings as well (2003). MacKendrick and Parkins (2004) used a quantitative measure of place attachment, defined as “bonds with places,” in a study of sustainability indicators for forest-dependent communities. The antecedents of place attachment have been explored in residential settings (Brown et al. 2004, Manzo and Perkins 2006). Quantitative indicators of place attachment have been linked to participation in community revitalization efforts (Manzo and Perkins 2006). Sense of place is socially constructed; the qualitative approach used in this study contributes to a deeper understanding of the meanings underlying sense of place in relation to tourism destination development.

Indicators provide information about a community's progress toward sustainability; they do not, in themselves, make a community more sustainable (Hart 1999). To achieve sustainability, indicators must be part of a process, such as LAC, that guides planning and management. Therefore, the variables that affect each indicator must be understood in order to link changes in indicator data to management actions. For example, planners and managers must know the antecedents of place attachment in a community in order to encourage increased place attachment. The following section describes LAC, a multi-step approach to achieving sustainability that includes the use of indicators. The purpose of this study was to determine whether qualitative indicators of sense of place can be identified and applied to tourism planning and management strategies using an LAC process.

1.2 Limits of Acceptable Change

LAC is a nine-step process designed to guide management decision-making, thereby enhancing the ecological and social conditions of a place. It is one of several approaches designed for outdoor recreation management that have been applied to tourism destinations. Ahn et al. (2002) used the LAC approach to assess sustainable tourism development on the Texas coast. Banks (2003) found that the LAC approach best expressed native resident perspectives in research

that compared three different approaches to tourism development carrying capacity. LAC is intended to identify and mitigate human impacts by determining achievable and desirable ecological and social conditions, analyzing current conditions, identifying management actions, and monitoring and evaluating management (Stankey et al. 1985). The objective of LAC management actions is to improve or maintain current conditions so they align with the achievable and desirable conditions. This study concentrated on step 1 (Identify area issues and concerns) and step 3 (Select indicators of resource and social conditions), with a focus on sense of place. The remaining LAC steps are outside the scope of this study.

Manning (2007) described the necessity of incorporating social norms into management decisionmaking. LAC explicitly includes social conditions in the analysis (Stankey et al. 1985). This study, with its focus on sense of place, explored constructed conditions. Incorporating local residents' values into management decisions can enhance planners' abilities to maintain communities where residents want to remain and facilitate the engagement of the host communities in the tourism industry; both of these endeavors are critical for long-term sustainability.

2.0 METHODS

Six focus-group sessions lasting approximately 1 ½ hours and facilitated by the primary author were held in June of 2008 to collect sense of place data from residents. Twenty-seven residents from Cold Spring, Beacon, and Kingston participated. The number of participants in each session varied from two to six. Sessions were recorded with audio equipment and recordings were transcribed verbatim. At the end of each session, participants completed short evaluation forms that included demographic questions.

The focus groups solicited information from community residents by creating a dialogic space. Dialogic space is an environment in which individuals can learn through open, nonjudgmental discussion (Schneekloth and Shibley 1995). Dialogue requires participants to collaborate, unlike an adversarial debate in which individuals argue their positions and listen in order to undermine the position of others.

2.1 Focus Group Design

A focus group protocol with specific questions was prepared to guide the discussions (Stewart et al. 2007). Nontechnical terms were substituted for theoretical terms, as necessary. For example, participants were asked about the value of places and resources in the community, rather than sense of place. Focus group participants had the opportunity to brainstorm responses together. Follow-up questions were designed to extract the meaning given by residents to community attributes.

2.2 Participant Selection

Potential participants were contacted using a snowball sampling technique (Bogdan and Biklen 2007). One or two municipal employees in each community acted as gatekeepers, who provided the names of individuals and organizations that might be interested in participating. The snowball technique was selected because it generates a nonrandom sample of people interested in community involvement. These individuals are likely to be better able (and more willing) to participate than a randomized sample from the general public. A limitation of this method was that the focus groups did not include representatives of all community interests. A further limitation of this study was the small number of participants. The results reflect only the participants' perceptions and cannot be generalized to a larger population.

2.3 Data Analysis

The transcripts were analyzed to identify common and repeated themes using an emergent coding process (Bogdan & Biklen, 2007). During transcription of the audio recordings, initial themes began to emerge. In further data analysis, repeated terms were identified and highlighted. Those terms were clustered and coded based on shared or related meaning. The co-authors reviewed the transcripts and codes to verify the themes.

3.0 RESULTS

Two themes, the dynamism of sense of place and influences on sense of place, are discussed in the following sections. Other themes identified in the data analysis are outside the scope of this paper. Strength of sense of place changed over time, as did the

meanings and values associated with specific places in the three Hudson River Valley (HRV) communities. The evolution of sense of place over time followed similar patterns in the three communities. A social and economic heyday occurred in the region around 1900, followed by disruptions in sense of place as industry and tourism declined, resulting in loss of employment and out-migration. In recent decades, the local economies diversified, tourism regained a prominent role, and residents began to feel safer and more proud of their communities. Participants noted influences that they perceived as causes of the change in sense of place during the 20th century.

3.1 The Dynamism of Sense of Place

Sense of place emerged as a dynamic concept in all three communities. For example, Cold Spring participants recalled vacant buildings along Main Street during the 1980s. Those memories, combined with their expressions of pride in the uniqueness of their village, illustrate the recent strengthening of sense of place.

Adam: Right, it is a unique thing. It is a unique thing. And in '82 it was all boarded up. I remember.

Karen: And with shopping changing over the last 20 years, Cold Spring went through a big period with a lot of truly empty storefronts, without hope.

Similar place meanings were expressed in each community, but specific sites experienced shifts in meaning. One Beacon resident described Fishkill Creek's current role as a recreation site in the community and noted its industrial history.

Meghan: Yeah, absolutely as a recreation area, or you know. And it also is a historic place for many people because there used to be factories along the creek. So people have a recollection of that. Their relatives worked there.

The identity residents associated with their community was subject to changes over time as well. At different

points in a focus group session, Neil's words illustrate the change in Beacon's identity, from a factory town, to its recent rebirth as a center for the arts and home to Dia, a museum of contemporary art.

Neil: I mean it was a very industrial type of a town. So it was factories, so it had a lot of life to it because the businesses supported the ah, factories that support, you know, the community; then the cycle went round and round. So the money was being spent here; you had disposable income. As the factories started to leave and as the economic environment changed, so did Beacon. Beacon actually went into a very steep decline.

Neil: Artists were starting to come in to Beacon; it was Dia that really put Beacon on the map again. So now you, we have a lot more galleries; we have a lot more artists.

Participants were asked to describe changes their community had experienced in the last 10 years. Instead, they chose to chronicle changes over a much longer time period, often beginning with the perceived economic and social height of the Hudson Valley region at the end of the nineteenth century.

Ingrid: ...I mean in terms of that, I, I don't know if Kingston Point Beach and Park. It used to be, you know, it used to be a very, very popular destination. It was a place that the day liner would stop in the late 1800s. I mean there was an amusement park there and it was, you know... at the time it was essentially a separate city from Kingston, but it was certainly a big draw. I mean it really, really was important and then um, up through probably the early 1900s when they had the 1909 celebration, it was still pretty hot then.

Their descriptions of changes during the 20th century depict parallel declines in the economic and social viability of each community, followed by recent changes perceived to be primarily positive.

3.2 Influences on Sense of Place

The participants identified influences on the changing strength and meaning of sense of place. The influences were primarily external to the communities. External influences included industry shifts, transportation changes, relative real estate prices, the development of nearby big box stores, and Internet shopping. Internal influences, such as community planning and activism, received less attention, but still were noted as influences on sense of place.

The development of box stores and popularity of Internet shopping were depicted negatively. The other external influences had both positive and negative impacts on sense of place in the HRV communities. The departure of manufacturing firms and, more recently, IBM, was perceived as harmful to sense of place. People could no longer live, work, and play in the same community. In Beacon, the influx of artists has created new place meanings and strengthened sense of place. Highways made the communities more accessible by automobile, but the discontinuance of ferry service along the River has limited water transportation. Low real estate prices, as compared to other areas, attracted small businesses and new residents. Rising prices, especially in Cold Spring, have made it difficult for local businesses to survive.

Community planning and local zoning regulations were critical in enhancing sense of place in Beacon; they were noted as potential strategies for Kingston and Cold Spring. Community activism, through formal volunteerism on municipal boards or in non-profit organizations, and through less formal participation at meetings and events, was credited in all three communities as contributing to sense of place.

4.0 DISCUSSION

Participants' comments indicated that strength of sense of place varied dramatically in these communities during the 20th century. Sense of place was not a static concept; it changed over time in response to influences inside and outside the communities. Specifically, strength of sense of place and the context or content that people perceived as the source of community sense of place changed over time. Davenport and Anderson (2005) found that

people residing near the Niobrara River (a national scenic river in Nebraska) articulated changing place meanings; meaning changes resulted from individuals' life experiences and outside influences. Bonds with place have been linked to participation in revitalization efforts (Manzo and Perkins 2006). The stronger residents' sense of place, the more stable their community is likely to be. If, on average, residents have few or no place meanings associated with their community, it is less stable. Planned developments, as well as other events and situations, such as elevated crime rates and natural disasters, have disrupted people's bonds with places (Manzo and Perkins 2006). In the HRV communities, residents linked disruptions in sense of place to a long decline in the early and middle 20th century that has gradually been reversed in recent decades. They linked the reversal to community activism.

Sense of place is a qualitative concept, but it can be measured with quantitative scales. When compared in longitudinal studies, quantitative measurements show changes in the strength of sense of place over time. Therefore, it would seem appropriate to apply the LAC process to sense of place. Application of LAC would require the establishment of local indicator(s) of sense of place (step 3). Indicators of sense of place would be used to notify a community if its sense of place dropped below a certain threshold, allowing the community to take action to strengthen sense of place. The utility of an upper limit is less clear. An upper limit suggests that too much sense of place is harmful to a community. Tuan (1980) suggested that as strength of sense of place increased, the bond changed and the individual became rooted in the place. The implications of this phenomenon were not addressed in the project and are not discussed herein.

The meanings and values underlying sense of place also evolve over time. A place can have different meanings to different people. Value conflicts can result from disagreements over the meaning of places (Kaltenborn et al. 1999). The differing meanings can result in the selection of different community attributes to sustain. Consequently, determining limits to sense of place becomes more challenging. Numeric values can represent

the relative strength of sense of place, but might fail to capture shifts in place meanings (Davenport and Anderson 2005).

LAC assumes that definitions of the baseline condition and indicators remain constant. For example, a limit on wilderness camp areas may be associated with area (square meters) of exposed soil and vegetation loss; in this example, area as a unit measure, soil exposure, and vegetation have constant definitions and measurement methods. A wilderness management plan has specific criteria that are comparable to definitions and standards in other wilderness management plans. Results of interviews in the Hudson River Valley suggest that strength of sense of place and the definition underlying sense of place naturally change over time. Sense of place is not an indicator that fits cleanly within the framework of the LAC process because of its inherent variability.

Despite their incompatibility with the LAC process, place meanings should not be avoided during tourism planning and development processes. They provide a basis for consensus as residents share some place meanings; an understanding of place meanings is required to maintain a community's authenticity and appeal to residents and visitors (Hester 1985, Harrill 2004, Manzo and Perkins 2006).

5.0 CONCLUSIONS

Influences that alter places also alter place meanings; tourism development quantitatively and qualitatively alters places. Place meanings can be maintained, enhanced, or disrupted. Tourism planners should be cognizant of the following suggestions:

- 1) Sense of place naturally changes over time; the context that defines sense of place today may be different in the future.
- 2) Any commoditization of sense of place and natural resource attributes has an impact on local community residents (Hovinen 2002, Andereck et al. 2005).
- 3) The most marketable aspects of a community may jeopardize the attributes that create sense of place for current residents; promoting values that

are not shared by current residents may result in conflict.

- 4) Places in a community associated with highly valued place meanings may not be protected by legislation or regulation (Hester 1990).

In conclusion, developers, planners, and residents should be aware of the impact of developments on residents in their home communities. Plans that undermine sense of place are likely to generate opposition. Working with community stakeholders to identify place meanings, as Hester (1985) did in Manteo, North Carolina, provides an opportunity for consensus building. Although residents are not homogenous and their place meanings may at times be in conflict, they share bonds with the same place. Residents of the HRV perceived outside influences to have had more impact on sense of place than influences within their communities. Their comments indicated that community planning has played a limited role in influencing sense of place.

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The content of this paper reflects the views of the authors(s), who are responsible for the facts and accuracy of the information presented herein.

MODELING THE SCENIC BEAUTY OF THE HIGHLAND SCENIC HIGHWAY, WEST VIRGINIA

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Abstract.—Finding sites with a pleasant view is important to maximize visitors' scenic satisfaction. A geographic information systems analysis of viewsheds is helpful for locating sites with maximum visibility. Viewshed analyses can also be combined with public perceptions of scenic beauty for selecting the most scenic sites. This research modeled the perceived beauty of the Highland Scenic Highway of West Virginia with the visible land cover features in early and late fall 2007. The area of each land cover type visible from 16 different locations was calculated, and photographs taken at each of the sites were used to elicit public perceptions of scenic beauty. Forest cover was significantly related to the scenic beauty of late fall but not to that of early fall. This result shows that leaf cover diversity is a major factor in perceived scenic beauty in the study area.

1.0 INTRODUCTION

Enjoying scenery is one of the most common and popular recreation activities in the United States (Hammit et al. 1994) and other areas of the world (e.g., Hsieh et al. 1992, Carr and Axelson 2005). Passive sightseeing recreation activities like bus tours are particularly popular for older visitors (Steinitz 1990). Sightseeing depends on the scenic quality of features in the landscape (Hammit et al. 1994). The perceived benefits of sightseeing are directly related to the efforts of agencies that manage, protect, and develop sites for viewing and other uses (Hammit et al. 1994). Increasing demand for scenic quality and related recreational activities has led to official state and national designations of scenic byways and highways. Scenic byways and highways are tourist highways with roadsides or viewsheds (i.e., areas of land cover types visible to the human eye from a fixed vantage

point) that provide scenic and recreational opportunities (The National Scenic Byways Program 2009). However, sites along byways and highways cannot all provide the same level of scenic satisfaction to visitors since scenery and viewing distance vary from site to site. Therefore, to provide maximum scenic satisfaction to visitors, it is important to identify sites that can offer the best viewing opportunities.

In reality, finding the best sites for scenic beauty in the natural environment may be time-consuming and troublesome. It may also require detailed knowledge about the area and the types of land cover visible from particular sites. Several studies on scenic evaluations of forest environments have asked the public to rate photographs of specific landscape scenes (Shafer et al. 1969, Zube et al. 1975, Buhyoff and Leuschner 1978, Brown and Daniel 1984, Noe and Hammit 1988). Difficulties with this method are associated with calculating the total visible area and the land cover types. However, viewshed tools in geographic information systems (GIS) can help landscape designers and environmental managers locate sites with maximum visibility and desirable land cover(s) (Germino et al. 2001).

Viewshed analysis in GIS determines the visible areas on the landscape from a specified location (O'Sullivan and Unwin 2003). This type of spatial analysis is conducted using Digital Elevation Models (DEMs). The view to all other points on the DEMs is calculated by an imaginary profile being drawn from the vantage point to every other grid point. Successive heights along each profile are listed where it crosses a grid line to determine whether the point is visible (O'Sullivan and Unwin 2003). Grid cells are assigned a value "1" if visible and a value "0" if not. The output map displays the visible area from specific points on the DEMs. Various studies (e.g., La Kose 2004, Sevenant and Antrop 2007) have used GIS in this way to calculate viewsheds. Wing and Johnson (2001) conducted a viewshed analysis in the McDonald Forest, Oregon, to estimate the areas visible from roads and

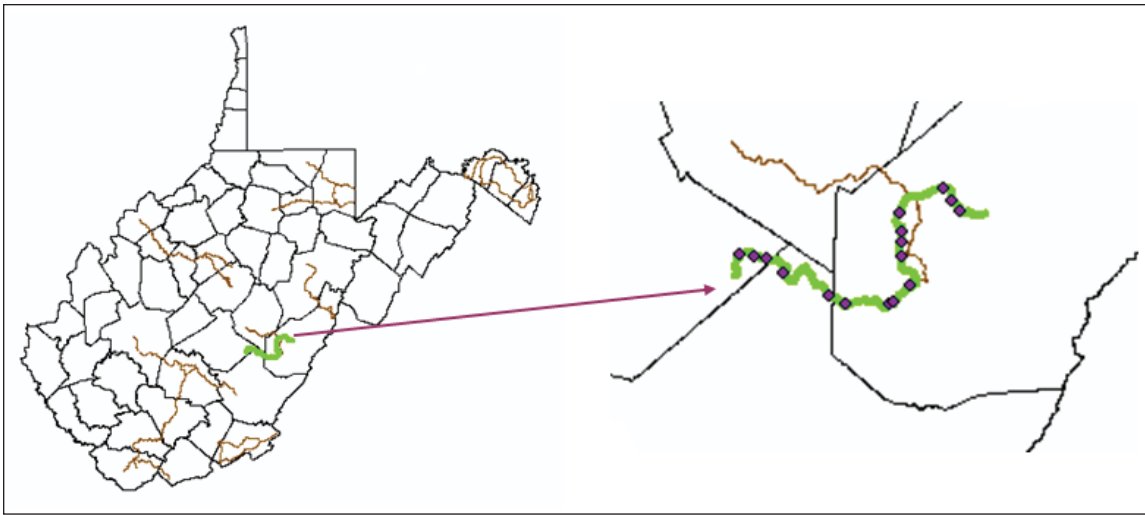


Figure 1.—Map showing the location of GPS points along the Highland Scenic Highway.

trails that visitors may use. Using the viewshed tool along with DEMs and land cover maps of the area, analysts can determine the total area of different land cover types visible from particular points on the ground.

Maximum visibility, however, does not necessarily correspond with scenic beauty. Scenic beauty is a relative measure of visual preference for a landscape (Daniel and Boster 1976), which may also vary with season. Therefore, selection of the best sites for scenic beauty in the natural environment requires integration of the visibility factor with perceived beauty metrics. Most research on scenic beauty assessments has focused on local features, rather than distant views. Adequate models of distant views have not been developed (Meitner and Daniel 1997). Therefore, the purpose of this paper was to model the perceived scenic beauty of the Highland Scenic Highway (HSH), West Virginia, in early and late fall of 2007 using both public preferences and viewshed analysis. The specific objectives were to explore what and how much can be seen along the HSH in West Virginia and to model the perceived beauty of the HSH with the visible land cover features.

2.0 METHODOLOGY

2.1 Study Area

The section of the HSH selected for this study is approximately 69.2 km long and runs through Pocahontas, Greenbrier, and Nicholas counties in West Virginia. The highway passes through mountainous

terrain of the Alleghany Highland and Plateau. It is one of the most forested scenic highways in the state. The elevation along the highway ranges from 708 m to more than 1371 m above mean sea level.

2.2 Dataset

The data used for calculating the viewshed included topography from 30-m U.S. Geological Surveys, DEMs, and land cover maps created using Thematic Mapper satellite images for the WV Gap Analysis Project (GAP) (Strager and Yuill 2002). In addition, GPS points and photographs of the study area were used. The effect of vegetation on the viewable area was estimated by adding the average height of vegetation classes to local elevation in the DEMs. The height of the vegetation was estimated using data on the average height of trees from the U. S. Department of Agriculture site (<http://fiatools.fs.fed.us/fiadb-downloads/datamart.html>). The estimated average height of the trees for the study area was 17.5 m.

2.3 Viewshed Calculation

Sixteen GPS points were selected along the highway. Some of the selected points were located at mountain ridges or existing overlooks, and some were random points along the highway. Figure 1 shows the location of the 16 points along the highway (point 1 to point 16 from left to right). These GPS points were used as input data along with DEMs of West Virginia for the viewshed analysis. Land cover maps were used to calculate the area of each land cover type visible from each of the sites.

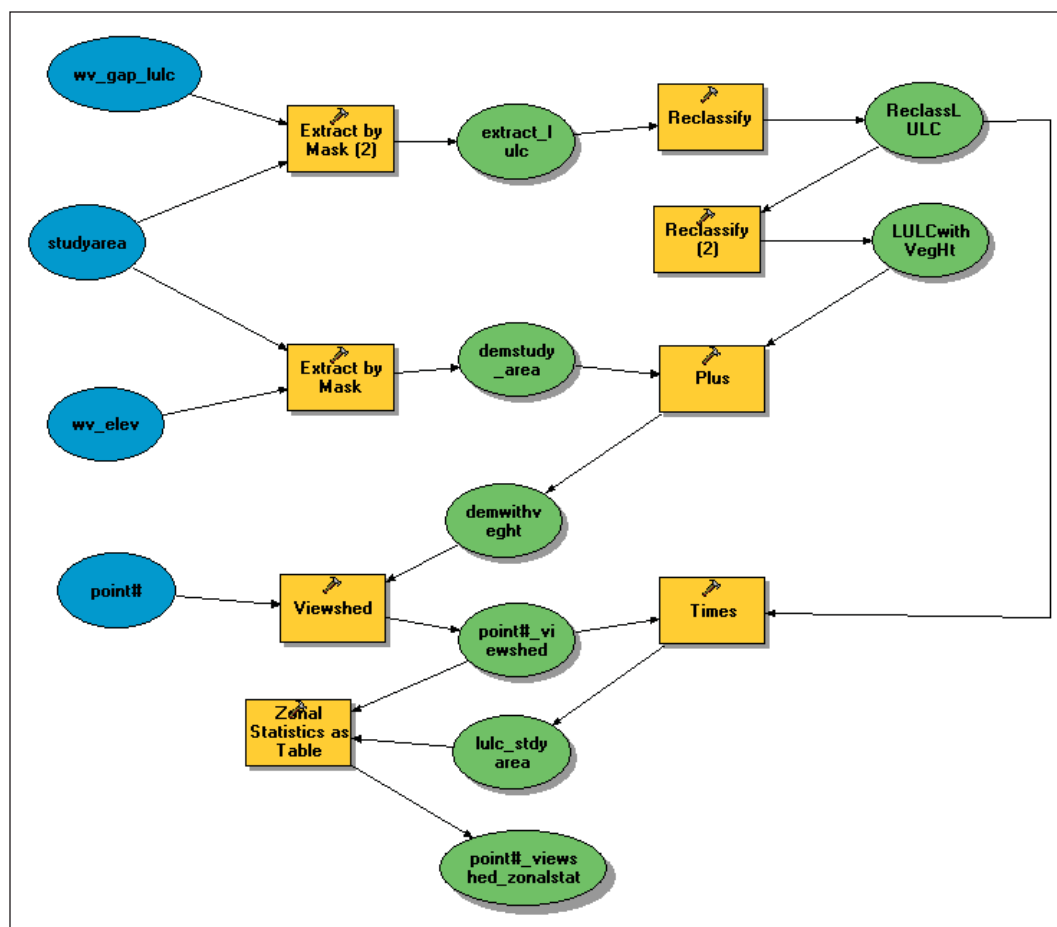


Figure 2.—Model for the calculation of viewshed.

The following steps were used to define the viewshed in ArcGIS:

- 1) DEM and land cover grid of the study area were extracted from their respective maps of West Virginia.
- 2) Twenty-six land cover types from the West Virginia GAP were reclassified into seven broad categories (developed, agriculture, shrubland/woodland, forested land, water, wetland, and barren land).
- 3) The average height of the trees for the study area (17.5 m) was added to the reclassified map from step 2.
- 4) To include the tree height in the DEM, the map obtained from step 3 was added to the DEM of the study area.
- 5) Using the DEM of the study area and the GPS points, viewsheds were calculated for every point.
- 6) Using the reclassified map from step 2 and viewshed maps from step 5, land cover types visible from the points were calculated.
- 7) Finally, the area of each land cover type in each viewshed was calculated.

The calculation of the viewshed was adjusted by adding an attribute item in the attribute table of the observer points. For this study, the observer height was set at 1.7 m above the elevation of the surface (i.e., the average viewer's eyes are expected to be approximately 1.7 m above ground level). The observer was positioned at the top of the canopy in cases where the height of vegetation at the observation point was higher than 1.7 m. The outer radius for the viewshed was set at 39 km based on La Kose's (2004) reasoning that air pollution is likely to prevent views over longer distances. Figure 2 shows the general work flow diagram (model) for calculating the viewsheds.



Figure 3.—Examples of photographs used for scenic beauty assessment for point 16 (left is September, right is October).

2.4 Scenic Beauty Estimation

Digital photographs of each study site were used to gather information on perceptions of scenic beauty. Photographs were taken from the same points with 360-degree coverage in September and October 2007; Figure 3 shows photographs taken from point 16 at the two different times. Eighty-four photos were taken in September (early fall) of 2007, but due to ongoing construction work along the highway, only 64 photos were taken in October (late fall) 2007. Photographs taken at the sites were shown to 35 undergraduate students at West Virginia University. Research has shown that college students tend to make similar scenic beauty judgments as the general public (e.g., Daniel and Boster 1976, Buhyoff and Leuschner 1978, Anderson and Schroeder 1983). The students were asked to rank the scenic beauty of the photographs on a scale of 0 to 10, with 0 indicating the lowest scenic beauty and 10 indicating the highest. They were told that the study was attempting to determine the public's scenic perception of several landscapes. Participants were not told anything about the sites and the seasons in the photographs because past studies in the other disciplines have shown that people tend to rank familiar areas more highly than unfamiliar areas (Jackson et al. 1978, Hammitt 1979, Balling and Falk 1982). Research by Cook and Cable (1995) and Buhyoff et al. (1986) used a scenic beauty estimation method proposed by Daniel and Boster (1976). However, this study used the actual ratings assigned to the photographs to avoid further calculations and transformations of the scenic beauty indices.

2.5 Data Analysis

The total area (in hectares) of all land cover types visible from each of the 16 points was calculated. The mean scenic beauty value was calculated for each of the points for September and October. T-tests were used to evaluate differences in the perceived scenic beauty of each point between early fall and late fall. Multiple linear regressions were used to model the relationship between the different land cover types (explanatory variables) and scenic beauty (response variable) for each time period.

3.0 RESULTS AND DISCUSSION

3.1 Viewshed Calculation

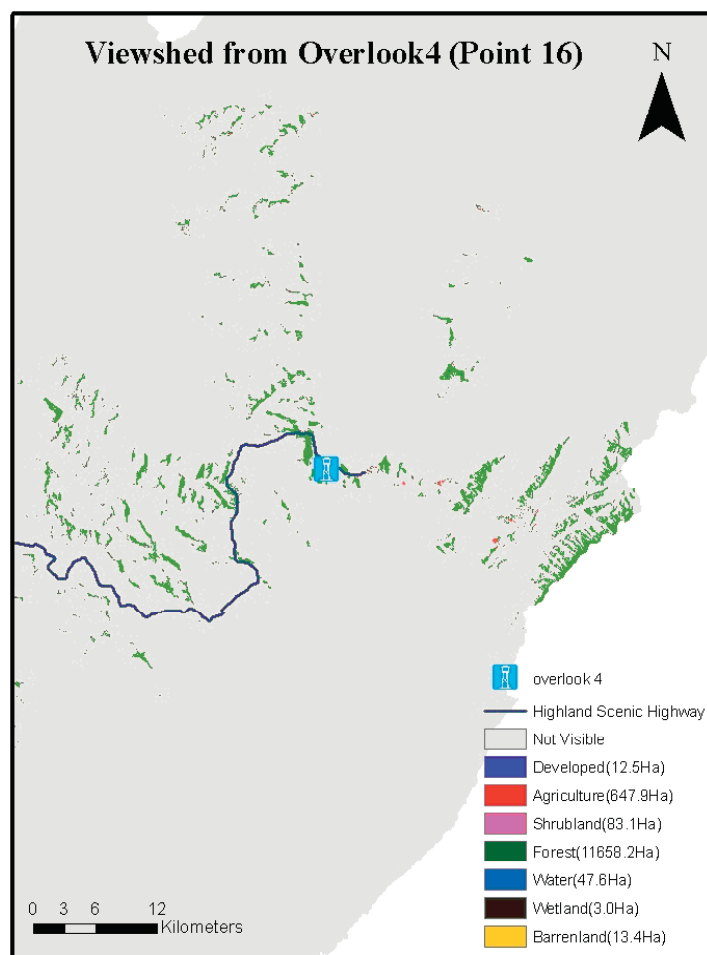
Point 9 had the largest viewshed area, followed by points 16, 11, 12, and 10, in that order (Table 1). These were also the only points from which all seven land cover types were visible. The point with the smallest viewshed was point 3, followed by points 2, 1, and 4, in that order (Table 1). Figure 4 shows point 16's GIS viewshed analysis with visible land cover types.

3.2 Scenic Beauty Estimation

The average values of perceived scenic beauty ranged from 3.13 to 7.48 for September and from 3.98 to 7.93 for October. The average perceived scenic beauty values for all 16 points for the two time periods are presented in Figure 5. Except for points 4, 5, and 15, all points have higher values in October than in September. T-test results showed significant differences between scenic beauty values for September and October (p -value < 0.015).

Table 1.—Viewshed results for all 16 points with area of visible land cover types in hectares

Point	Developed	Agriculture	Shrubland/ Woodland	Forested Land	Water	Wetland	Barren Land	Total
1	3.60	0.09	0.00	245.73	0.00	0.00	0.00	249.42
2	0.18	0.09	0.00	236.72	0.00	0.00	0.00	236.99
3	0.00	0.18	0.00	228.89	0.00	0.00	0.00	229.07
4	0.00	0.18	0.00	260.40	0.00	0.00	0.09	260.67
5	0.00	0.00	0.00	343.96	0.00	0.36	0.00	344.32
6	0.00	0.00	0.00	708.10	0.00	0.18	0.00	708.28
7	0.00	19.63	3.24	879.36	0.00	0.09	0.00	902.32
8	0.00	11.71	13.06	3667.18	0.00	11.89	0.00	3703.84
9	3.69	1969.51	124.17	12,465.60	89.50	44.48	1.17	14,698.12
10	0.54	72.93	29.71	7298.44	0.81	3.51	1.71	7407.65
11	9.54	110.66	53.40	12,233.20	1.53	0.63	26.20	12,435.16
12	3.51	136.78	44.03	10,906.60	0.72	1.08	55.65	11,148.37
13	0.00	3.24	3.51	697.65	0.00	0.00	0.00	704.4
14	0.00	71.31	22.87	3914.08	0.18	5.49	0.27	4014.2
15	9.09	92.29	28.54	6323.63	0.00	1.44	6.75	6461.74
16	12.52	647.95	83.11	11,658.20	47.63	3.06	13.42	12,465.89

**Figure 4.—GIS map showing viewshed from point 16.**

3.3 Scenic Beauty Modeling

The independent variables (i.e., the land cover types) considered for the regression had high levels of correlation. As a result, only the forest, agriculture, and nonvegetated land (combined barren land and developed area) variables were used. Tables 2 and 3 show the regression estimates of scenic beauty for each month. The regression for September was not significant, but the regression for October was significant at the 5 percent level of significance, and the variables in the model explained 43 percent of the variation in scenic beauty values. Only the variable “forest” was significant at the 5 percent level. The positive sign indicated that increasing the total forest area would increase the value of the scenic beauty in late fall. Furthermore, the negative sign of the nonvegetated areas (i.e., barren and developed) indicates an inverse relationship with scenic beauty values when other factors are held constant.

Forest cover had a significantly positive relationship with scenic beauty for October but not for September, implying that scenery in the area is more beautiful in October than in September. Although the area of land

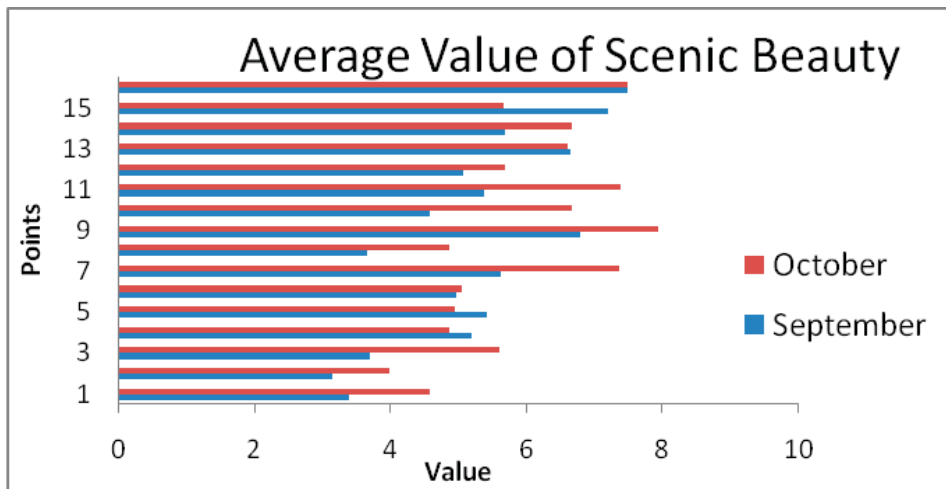


Figure 5.—Average value of scenic beauty for all 16 points for September and October.

Table 2.—Linear regression estimate for scenic beauty for September 2007

Ordinary Least Squares estimates using the 16 observations

Dependent variable: September Scenic Beauty

Variable	coefficient	std. error	t-ratio	p-value
const	4.6401	0.4533	10.2358	0.0000
Forest	0.0001	0.0001	0.9746	0.3490
Agriculture	0.0007	0.0008	0.7974	0.4407
Barren and Developed	-0.0140	0.0343	-0.4079	0.6905
P-value(F)	0.2232			
R-squared	0.2962			
Adjusted R-squared	0.1203			

Table 3.—Linear regression estimate for scenic beauty for October 2007

Ordinary Least Squares estimates using the 16 observations

Dependent variable: October Scenic Beauty

Variable	coefficient	std. error	t-ratio	p-value
Const	5.1550	0.3301	15.6166	0.0000
Forest	0.0002	0.0001	2.3066	0.0397
Agriculture	0.0005	0.0006	0.8629	0.4051
Barren and Developed	-0.0343	0.0250	-1.3721	0.1951
P-value(F)	0.0205			
R-squared	0.5443			
Adjusted R-squared	0.4303			

cover visible from all the points is the same for both months, diversity in leaf color in October (late fall) seems to add to the perceived beauty of the area. This result is consistent with previous findings that people prefer diversity in the landscape of forested regions (Cherem and Traweek 1977, Ribe 1986, Axelsson-Lindgren and Sorte 1987).

Forests are the most visible land cover type from all points along the Highland Scenic Highway, followed by agriculture land; water and wetland are the least visible land cover types. The average viewshed at all 16 points is 97.6 percent forest, which means that forests have the largest influence on scenic beauty in the area. The negative relationship between scenic beauty and barren

land implies that planting vegetation on barren land and reducing clear cutting would help increase the perceived natural beauty of the area. In addition, planting trees in and around the developed areas would both benefit the local environment and provide a better vista for tourists.

Regarding the results from the viewshed analysis and the perception of scenic beauty for each location, sites with diverse land cover types and larger visible areas were generally ranked higher than sites with fewer cover types and smaller viewsheds. According to these criteria, point 9 is the most suitable for sightseeing, followed by points 16 and 11. Points 16 and 11 are existing scenic overlook spots on the HSH. All the points except 4, 5, and 15 have higher values in October than September; points 4, 5, and 15 may experience earlier leaf-off conditions than other points.

Although the viewshed tool in GIS and the survey of photographs are promising in explaining the relationships between scenic beauty and the visible land cover for two different months, certain limitations might have influenced the findings. This study used a land cover and elevation dataset with 30-m resolution. This coarse resolution strongly affects calculations of the area of the different land cover types in each viewshed. In addition, some of the sites' viewsheds included land in Virginia, but data for Virginia were not included in the analyses.

Future research needs to examine simultaneous observations of topographic variation like shapes and patterns of the features within the viewshed for a given point. This type of investigation will test variables that can explain more variation in scenic beauty estimates. In addition, this study examined scenic beauty for two months; a longer period of observations might help expand and refine the findings. Finally, high resolution datasets would be extremely beneficial in future viewshed analyses.

4.0 CONCLUSIONS AND IMPLICATIONS

Forest was found to be the major land cover type providing scenic beauty in the HSH. There was a significant relationship between scenic beauty and visible

land cover types in October but not September. These results indicate that as the diversity of leaf color increases, the level of perceived scenic beauty also increases. The types of land cover visible from the particular locations and the area of each land cover type can be directly calculated using tools in GIS. This approach provides a powerful way to model scenic beauty using the diversity and extent of visible land cover types. Additionally, the negative relationship between scenic beauty and nonvegetated land suggests that basic land-use planning focused on increasing vegetated land cover could increase perceived scenic beauty in the area. This kind of study could be used to select locations for new overlooks or viewing towers. The extent of visible land cover types could be described in interpretive signage to educate visitors about how land cover types are related to scenic aesthetics. Findings from this type of analysis could also be displayed in travel guides and on tourism websites to attract prospective visitors and promote season-based tourism in the area.

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The content of this paper reflects the views of the authors(s), who are responsible for the facts and accuracy of the information presented herein.

PREDICTORS OF VISITORS' INTENTION TO RETURN TO A NATURE-BASED RECREATION AREA

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Abstract.—This study explored predictors of recreationists' intention to return to Santee Cooper Country (SCC), a popular destination for angling-based tourism in South Carolina. Our hypothesized model indicated that recreationists' experience use history and place satisfaction would positively affect four dimensions of place attachment to SCC. Place attachment was also modeled as a predictor of intention to return to SCC. In addition to testing the hypothesized relationships, this study examined the effect of two moderators, place familiarity and angling skill, on these relationships. Invariance tests across the four groups illustrated that highly skilled recreationists' intention to return was driven mostly by their emotional attachment to the recreation area, while the lower-skill group's intention to return was driven mainly by social ties to SCC. Place familiarity had no significant moderating effect.

1.0 INTRODUCTION

Enticing visitors to return to amenity-based recreation areas is an important factor underlying the financial success of local tourism-related industries. As a result considerable effort has been devoted to understanding what encourages return visits to recreation areas. Among various kinds of outdoor recreation activities, nature-based recreation areas provide an opportunity to satisfy recreational needs while maintaining the diversity and richness of the place's natural, cultural, and historical resources (Shrestha et al. 2007). As many people seek forests, parks, and preserves to enjoy nature-based recreation (Shrestha et al. 2007), it is important to consider factors that influence visitors' intention to return to these areas. In this investigation, we explored several factors that drive recreationists' intention to return to nature-based recreation areas.

This study tested a path model for understanding the relationships between place satisfaction, experience use history, place identity, place dependence, affective attachment, social bonding, and intention to return using a survey of anglers in Santee Cooper Country (SCC), a popular destination for angling-based tourism in South Carolina. The research also examined the moderating effect of recreationists' self-reported angling skill and level of familiarity with SCC. For angling skill, previous studies have shown that skilled anglers have stronger place preferences (Bricker and Kerstetter 2000, Kyle et al. 2003), which determine resource substitution behaviors and individuals' attachment to place. As Havitz and Dimanche (1997) stated, more experienced recreationists' awareness set (the group of potential setting substitutes people simply know) for resource substitutes is more extensive, and their evoked set (the group of potential setting substitutes they actually consider) is substantially narrower than those of less experienced recreationists. Since skill level plays an important role in recreationists' attachment to place as well as in recreational behavior, this study also examined its impact on these hypothesized relationships.

2.0 LITERATURE REVIEW

2.1 Place Attachment

In the place literature, place attachment research has examined human-place bonding primarily in terms of emotional and functional attachments to specific locales (Low and Altman 1992). While affect appears to be central to bonding processes (Low and Altman 1992), the literature has also acknowledged several other aspects of attachment. These facets include place identity, which refers to the cognitive connection between the self and the physical environment (Proshansky 1978). In this context, the physical environment offers individuals an opportunity to express and affirm their identity (Kyle et al. 2004). Place attachments that reflect people's appreciation of a setting's functional utility have also been acknowledged (i.e., place dependence) (Stokols and Shumaker 1981). Place dependence is connected to

a setting's ability to facilitate desired outcomes (Stokols and Shumaker 1981). Finally, research has also shown that place attachments can be an artifact of individuals' social ties to a place (Mesch and Manor 1998, Kyle and Chick 2007). In these contexts, place attachments are driven by the bonds that people share with others. The study of place attachment in the context of outdoor recreation has built upon the work of geographers and environmental psychologists (Buttimer 1980, Tuan 1980, Low and Altman 1992).

2.2 Experience Use History

Experience use history (EUH) refers to recreationists' past experience with an activity or setting (Hammitt et al. 2004). It most commonly measures recreationists' total visits to an area, their years of use, and frequency and duration of participation (Hammitt and McDonald 1983, Schreyer et al. 1984). In general, the EUH literature has illustrated that more experienced recreationists display greater knowledge and familiarity with activities and places (Schreyer et al. 1984), which provides them with a richer cognitive and affective base for appreciating the resource and activities (Manning 1999). Because use history is cumulative, Schreyer et al. (1984) defined EUH in terms of a continuum, where recreationists begin as novices and become experienced or specialized users of the resource and/or activity. Past work has shown that recreationists' repeated and lasting place interactions promote emotional ties to a place (Buttimer 1980, Hay 1998 Hammitt et al. 2009). Since individuals can be very habitual in returning to a site and become loyal to certain places (Havitz and Dimanche 1997), EUH is regarded as an antecedent of recreationists' attachment to place and their behavior regarding returning. Previous research has shown that EUH is a strong predictor of human-place bonding and provides insight into recreationists' familiarity and satisfaction with specific environments.

2.3 Place Satisfaction

In the place literature, place satisfaction is conceived of as an individual's assessment of how well a particular setting serves individual needs (Ladewig and McCann 1980, Mesch and Manor 1998). Although place satisfaction is recognized as an important factor

facilitating recreationists' returning behavior, research related to place satisfaction is oddly absent from the place literature (Stedman 2002). Most researchers in community sociology argue that place satisfaction and place attachment should be distinguished from one another (Mesch and Manor 1998, Theodori 2000). Since some researchers (Mesch and Manor 1998) point out that satisfaction does not automatically ensure the formation of place attachment, there is a need to examine the relationship these constructs share (Theodori 2001). In this investigation, place satisfaction was modeled as an antecedent of place attachment. The consumer behavior literature supports this directionality. In studies of consumers' brand loyalty, models have typically shown that satisfaction is a primary antecedent of attitudinal loyalty (Bitner 1990, Yu 2001). Research published in the leisure literature has demonstrated that place attachment shares conceptual similarity with attitudinal loyalty (Kyle et al. 2004, Kyle et al. 2006). Thus, consistent with this prior work, place satisfaction was also modeled as an antecedent of place attachment in this study.

2.4 Intention to Return

In marketing research, behavioral intentions have been viewed as indicators that provide insight into whether customers will remain with or defect from a service provider (Ziethaml et al. 1996). Studies of consumer loyalty have demonstrated its importance for agency success. Loyal customers are more likely to say positive things about the company to others (Boulding et al. 1993), express preference for the company over others (Parasuraman et al. 1988), or demonstrate a willingness to pay more for products or services (Newman and Werbel 1973, LaBarbera and Mazursky 1983, Rust and Zahorik 1993). Marketing research has also shown that behavioral intentions are strong predictors of actual behavior and that behavioral intentions are closely related to customer satisfaction and service quality (Ziethaml et al. 1996). Thus, it is necessary to investigate place-relevant variables that represent recreationists' attitude toward place, such as place satisfaction and place attachment, to reveal the relationship between attitude and intention.

Table 1.—Means, standard deviation, and reliabilities of manifest variables

Items	α	M	SD
<i>Experience Use History</i>	.415		
In what year did you make your first visit?		1991.85	11.99
How many visits to Santee Cooper Country have you made since your first visit?		11.40	8.83
<i>Place Attachment</i>			
<i>Place Identity (eight items)</i>	.90	3.29	.68
<i>Place Dependence (four items)</i>	.83	3.24	.85
<i>Affective Attitude (three items)</i>	.82	3.44	.85
<i>Social Bonding (five items)</i>	.79	3.63	.74
<i>Satisfaction</i>			
How satisfied are you with the fishing at the lake you fish most often in SCC?		3.69	.93
<i>Intention to Return</i>			
How likely is it that you will visit SCC within the next 12 months?		3.94	.81
<i>Place Familiarity</i>			
Please indicate how familiar you are with SCC.		4.93	1.52
<i>Angling skill</i>			
Please rate your level of fishing experience.		3.44	.82

3.0 METHODS

3.1 Sample and Study Context

Our data were collected from consumers inquiring about angling opportunities in SCC, South Carolina. Names and addresses were drawn from a database maintained by the Santee Cooper Counties Promotion Commission, a not-for-profit organization acting on behalf of a five-county region in South Carolina. These counties lie around the perimeter of Lakes Marion and Moultrie, popular fishing destinations that attract visitors from across the United States. Combined, the two lakes and diversion canal connecting them cover approximately 156,000 acres and provide 450 miles of shoreline. A survey instrument was sent to 2,750 randomly selected people from the database using a modified Dillman (2000) procedure. The sample contained 581 addresses that were no longer valid. The procedure yielded 430 completed surveys for a response rate of 20.0 percent. For this analysis, we selected only past visitors ($n = 248$) to determine their attachment to the place.

3.2 Measures

Experience use history was measured using two items: respondents' year of first visit and the number of visits since (see Table 1). While the reliability of these two

items was shown to be mediocre ($\alpha = .415$), some authors have suggested that these items do not lend themselves to tests of internal consistency (Kyle et al. 2004). Consequently, we retained these items for further analyses. Place satisfaction was measured using a single indicator. Respondents were asked to indicate how satisfied they were with their experience at SCC. Response categories ranged from 1 = poor through 6 = perfect. Place attachment was measured using 20 items drawn from Kyle et al. (2004). Respondents were asked to indicate their level of agreement with a series of statements relating to SCC. Response categories were 1 = strongly disagree through 5 = strongly agree. As noted, these items measured four dimensions of attachment: place identity, place dependence, affective attachment, and social bonding. All dimensions displayed good internal consistency (i.e., all $\alpha > .75$). Items loading onto each dimension were parceled to create a single indicator for further analyses (Williams and O'Boyle 2008). Intention to return was also measured using a single indicator. Respondents were asked to indicate the likelihood of their return on a 5-point scale ranging from 1 = very likely through 5 = no chance. Last, our two moderating variables were also measured using single indicators. For place familiarity, respondents were asked

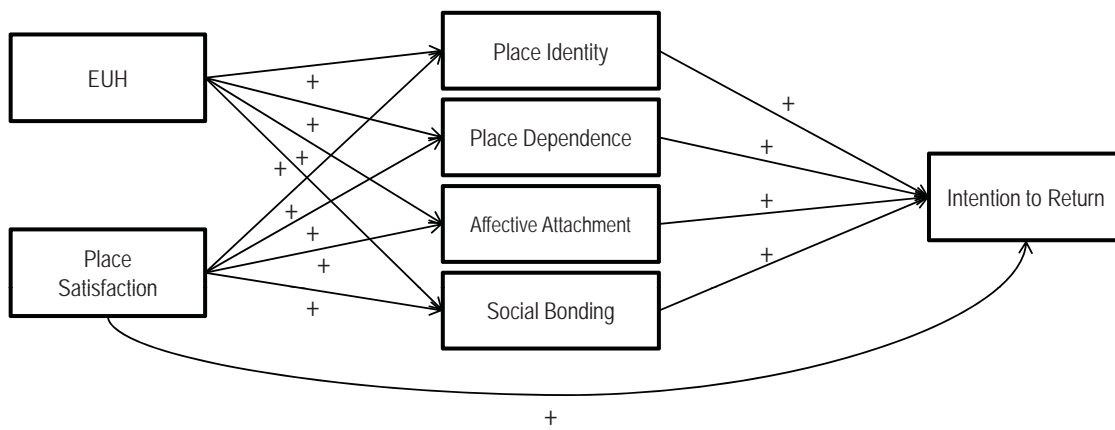


Figure 1.—Hypothesized model.

to indicate how familiar they were with SCC. Response categories ranged from 1 = not at all familiar through 9 = extremely familiar. For respondents' fishing experience, they were asked to indicate their experience along a 5-point scale ranging from 1 = novice through 5 = expert.

4.0 ANALYSES AND FINDINGS

4.1 Descriptive Analyses

The means and standard deviations are reported in Table 1. On average, respondents indicated first visiting SCC in 1991. They expressed modest levels for attachment with SCC with averages ranging between 3.24 for place dependence and 3.63 for social bonding. Respondents also expressed satisfaction with their visit ($M = 3.69$) and a propensity to return ($M = 3.94$).

4.2 Model Testing

We first tested the hypothesized model (Fig. 1) using the pooled sample with the manifest-variable regression in LISREL 8.70 (Jöreskog and Sörbom 2004). Selected goodness-of-fit indices were used in reporting the results of our model testing. These included Steiger and Lind's (1980) Root Mean Square Error of Approximation (RMSEA), Bentler and Bonnett's (1980) Non-Normed Fit Index (NNFI), and Bentler's Comparative Fit Index (CFI). The results of path model testing are displayed in Table 2. Our hypothesized model (i.e., baseline model) showed a good fit ($\chi^2 = 9.039$; $df = 5$, $RMSEA = .043$, $NNFI = .992$, $CFI = .998$). To examine the moderating effect of place familiarity and perceived skill on the relationships tested in the hypothesized model, the sample was split around the median scores on the place familiarity and skill indicators to reflect high and

low for each of these indicators. Two models were then tested among the high and low groups using LISREL's groups function. The model displayed relatively good fit for both of the place familiarity groups (Low familiarity: $\chi^2 = 21.708$; $df = 5$, $RMSEA = .087$, $NNFI = .961$, $CFI = .991$; High familiarity: $\chi^2 = 26.326$; $df = 5$, $RMSEA = .099$, $NNFI = .542$, $CFI = .891$) but were mixed for the skill-level groups. The low-skill group showed a relatively poor fit ($\chi^2 = 200.908$; $df = 5$, $RMSEA = .285$, $NNFI = .542$, $CFI = .891$), whereas the high-skill group showed a good fit ($\chi^2 = 19.723$; $df = 5$, $RMSEA = .082$, $NNFI = .973$, $CFI = .994$).

To examine the moderating effect of familiarity and skill on the relationships tested in our hypothesized model, invariance testing was used to examine variation across the groups (Table 3). This procedure tested whether the beta weights were significantly different among these groups. Beta coefficients were first constrained to be invariant across the two groups (i.e., high/low familiarity and then high/low skill) to analyze whether the imposition of the constraint significantly affected the model fit. We found no significant difference between less familiar and more familiar groups in terms of their regression coefficients ($\Delta\chi^2 = 17.097$; $\Delta df = 13$, $RMSEA = .029$, $NNFI = .993$, $CFI = .997$). For the comparison of low-skill and high-skill visitors to SCC, we found that imposing the invariance constraint significantly influenced model fit ($\Delta\chi^2 = 31.263$; $\Delta df = 13$, $RMSEA = .0867$, $NNFI = .947$, $CFI = .979$). Therefore, there was a significant difference between low-skill and high-skill groups in terms of the regression coefficients. Specifically, the following relationships are significantly different

Table 2.—Summary of model testing procedure

Model	χ^2	df	RMSEA	NNFI	CFI
<i>Baseline Model (overall sample)</i>					
Path Model	9.039	5	.043	.992	.998
Less Familiar	21.708	5	.087	.961	.991
More Familiar	26.326	5	.099	.542	.891
Low Skill	200.908	5	.285	.542	.891
High Skill	19.723	5	.082	.973	.994

Table 3.—Invariance tests

Invariance tests	χ^2	df	$\Delta\chi^2$	Δdf	RMSEA	NNFI	CFI
<i>Less Familiar and More Familiar Groups</i>							
Baseline	2.174	4			.0	1.023	1.000
Invariant Regression Coefficients	19.271	17	17.097	13	.0289	.993	.997
<i>Low-Skill and High-Skill Groups</i>							
Baseline	12.358	4			.118	.929	.993
Invariant Regression Coefficients	43.621	17	31.263**	13	.0867	.947	.979
Final Model	25.961	14			.0728	.971	.990

** $p < .01$

across the two skill groups: satisfaction-intention, social bonding-intention, and affective attachment-intention.

4.3 Summary of Effects

Our findings are summarized in Table 4. Overall, the valence of all the relationships was consistent with our hypotheses. With regard to the effect of EUH on the four dimensions of place attachment, EUH accounted for less than 2 percent of the variance in each dimension of place attachment, except for the affective attachment. With regard to the relationship between place satisfaction and the dimensions of place attachment, place satisfaction was a much stronger predictor of place attachment than was EUH. With regard to the variance for the two skill groups, the R^2 values were somewhat higher for the high-skill group compared to the low-skill group for all of the dependent variables in the hypothesized relationships. Specifically, the following relationships were observed:

- a) Place identity was positively influenced by EUH ($\beta = .131$, t -value = 3.136, $p < .001$) and place satisfaction ($\beta = .479$, t -value = 11.442, $p < .001$) and accounted for 17.8 percent of the variance for the low-skill group and 26.5 percent of the variance for the high-skill group. Given

that highly skilled recreationists are more likely to form an attachment to preferred settings, it is reasonable to assume that their experience and satisfaction positively affect their identification with the setting.

- b) Place dependence was influenced by EUH ($\beta = .124$, t -value = 3.022, $p < .01$) and place satisfaction ($\beta = .514$, t -value = 12.551, $p < .001$) and accounted for 22.9 percent and 25.7 percent of the variance in the low-skill and high-skill groups, respectively. This finding indicates that respondents' functional attachment to SCC is driven by their experience and satisfaction with the setting. The strength of these effects did not vary across the groups.
- c) Affective attachment was influenced by EUH ($\beta = .276$, t -value = 6.840, $p < .001$) and place satisfaction ($\beta = .476$, t -value = 11.800, $p < .001$) and accounted for 20.4 percent of the variance for the low-skill group and 31.3 percent of the variance for the high-skill group. This finding indicates that recreationists' past experience and satisfaction with the setting is predictive of their emotional attachment to SCC for both groups.

Table 4.—Regression coefficients

Dependent Variable	Predictor	B	SE	β	t	R^2	
						Low Skill	High Skill
Place Identity (PI)	EUH	.246	.078	.131	3.136**	.178	.265
	P-Satisfaction	1.676	.146	.479	11.442***		
Place Dependence (PD)	EUH	.180	.060	.124	3.022**	.229	.257
	P-Satisfaction	1.400	.112	.514	12.551***		
Affective Attitude (AA)	EUH	.311	.045	.276	6.840***	.204	.313
	P-Satisfaction	1.004	.085	.476	11.800***		
Social Bonding (SB)	EUH	.213	.079	.116	2.690**	.243	.150
	P-Satisfaction	1.459	.148	.427	9.860***		
Intention to Return (IR)	PI	-.001	.021	-.003	-.041	.224	.311
	PD	.001	.020	.004	.067		
	AA	.093	.031	.231	2.969**		
	SB	.029	.016	.117	1.820		
	P-Satisfaction	.326	.038	.384	8.639***		

* $p < .05$, ** $p < .01$, *** $p < .001$

- d) Social bonding was positively influenced by EUH ($\beta = .116$, t -value = 2.690, $p < .01$) and place satisfaction ($\beta = .427$, t -value = 9.860, $p < .001$). It accounted for 24.3 percent of the variance for the low-skilled recreationists' and 15 percent the variance for the high-skill group. This result suggests that less skilled anglers care more about their social ties to SCC than do highly skilled anglers.
- e) Recreationists' intention to return to SCC was positively influenced by their affective attachment ($\beta = .231$, t -value = 2.969, $p < .01$) and place satisfaction ($\beta = .384$, t -value = 8.639, $p < .001$) and accounted for 22.4 percent and 31.1 percent of the variance for the low-skill and high-skill groups, respectively. Thus, respondents' emotional attachment and overall satisfaction with SCC are compelling drivers of their intention to return to the area.

5.0 DISCUSSION

Using data collected from anglers who had previously visited SCC, we showed that both EUH and place satisfaction significantly and positively impacted visitors' attachment to SCC and their intention to return. Of place attachment's antecedent conditions, we found that place satisfaction was a much stronger driver of

respondents' attachment to SCC in addition to their intention to return. Further, self-reported angling skill influenced the strength of these relationships.

In addition to affective attachment, our findings indicate that all dimensions of place attachment (place identity, place dependence, social bonding, and affective attachment) were positively influenced by EUH, albeit weakly. However, EUH had only an indirect effect on intention to return to SCC mediated through the dimensions of place attachment. With regard to the measurement of the EUH construct, concern has been expressed about "how the individual measures are combined to form the index" (Hammitt et al. 2004, p.372). Since EUH is composed of multi-item measures, it should be aggregated from past participation variables such as duration and frequency. While this study standardized the past experience indicators to formulate a parceled indicator of EUH, it is still necessary to consider appropriate combinations of various past participation variables when examining the EUH construct.

Although place satisfaction plays a significant role in developing recreationists' attachment to the setting, previous place literature appears to have overlooked its importance. The findings of this study indicate that place satisfaction had the strongest influence on place

attachment and visitors' intention to return to the SCC. Community sociology (see Theodori, Stedman and colleagues) has provided several illustrations of place satisfaction's influence on place attachment (Hammitt et al. 2004). However, as noted by Mesch and Manor (1998), people can be satisfied with a place but not necessarily attached to the landscape. Further, Freid (1984) noted that satisfaction is a relatively shallow construct compared to attachment in terms of people's psychological responses to the environment. Place satisfaction involves a uniform evaluation of the setting that relies on its value in light of certain outcomes. Place attachment, however, is much more nebulous. While it may or may not rely on a subjective evaluation that is reflected in the concept of place satisfaction, it also involves the interplay among emotion (positive and negative), social interaction, and the attributes that characterize the setting. Thus, this study supports previous work suggesting the importance of place satisfaction as a driver of place attachment and visitors' intention to return to recreation areas.

With regard to the moderating effect of place familiarity and perceived skill, the findings indicate that recreationists' skill level significantly altered the relationships among EUH, place satisfaction, place attachment, and intention to return. Low-skill group respondents emphasized social bonding ties to SCC. For this group, the basis of their attachment to place lay in their social connections to the area. In contrast, for the high-skill group, respondents' affective attachment was the strongest predictor of their intention to return. These recreationists are more place-focused because the setting's attributes have direct bearing on the quality of their angling experience.

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The content of this paper reflects the views of the authors(s), who are responsible for the facts and accuracy of the information presented herein.

OUTDOOR RECREATION II

CONSTRAINTS AND BENEFITS OF CHANGING THE DISTRIBUTION PROCESS FOR RECREATION SPECIAL USE PERMITS IN THE U.S. FOREST SERVICE

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Abstract.—A significant policy change governing recreation Special Use Permits on U.S. Federal lands was implemented in October 2008. The changes may have a major impact on current and potential recreation users, members of local communities, and existing outfitter/guide services. This paper presents findings from interviews with permit distribution supervisors about changes in the permit allocation process. This research is one part of a larger project focused on developing a universal but flexible framework by which permit distribution officials can allocate and monitor recreation Special Use Permits.

1.0 INTRODUCTION

The regulation of use has been a concern since the first public lands were created in the United States, and it continues to be a constant issue for land managers today. Visitor use has many subcategories, such as individual versus group use, and monitoring efforts also focus on the people or services that bring people onto public lands. Federal regulations are in place for ecological management, but it is up to individual land managers to know the specific ecological and social carrying capacities of their area, and to develop a customized framework for managing and monitoring use (Holdgate 1984, Legore 1984, Watson et al. 2000, Manning and Lawson 2002, Collins and Brown 2007).

As of October 2008, new policies require changes to the recreational Special Use Permitting process that applies to outfitter and guiding services. These organizations, which bring groups of people onto publicly managed lands, hold one of two types of Special Use Permits (SUPs): priority or temporary. Priority permit holders are usually those whose business or service focuses and/or takes place almost exclusively on public lands. Priority use permits tend to have longevity and allow many consecutive days of use. For example, a whitewater rafting business with an equipment store and guiding service would be both an outfitter and guide service, and would need a priority use permit. Temporary permit holders have fewer days of use, usually only for a specified time period (Brown 2008). Recreation events, such as bike races or Boy Scout camps, would receive a temporary permit. Recent changes to the Special Use Permitting process will affect both types of permit holders.

Priority use permits will last for 5 years instead of 10; they will be monitored more strictly for quality of service and percentage of allotted days actually used. The main drawback for priority permit holders will be the loss of some flexibility about which days they can use the area. This change will have the biggest effect on priority outfitters/guides that operate during the shoulder season (between the peak and off-peak seasons) and depend on the flexibility of use days when the weather and the number of users (clients) fluctuate considerably. Temporary use permit holders will also be strongly affected since the first step of the changes is to cancel all existing temporary permits. Temporary permits will then be allotted on a first-come, first-served basis from a *temporary use pool*. Therefore, temporary users that want to request many use days will have an incentive to apply for a priority use permit, and other temporary users will have to compete against each other for use days. This process gives everyone a fair chance at use access and increases overall opportunities to provide a greater variety of activities. In addition to affecting permit holders, these changes will affect members of the general public who use these resources and resource services.

The primary objective of the proposed policy changes is to increase the efficiency of the existing permit distribution processes to improve the quality and variety of services that permit holders provide. Permitting officials plan to achieve greater variety by developing a temporary use permit allocation process that facilitates greater outfitting/guiding participation by young people and educational or religious groups. Permitting officials also intend to institute policies for allocating priority use permits that are based on performance, evaluations, and type of use (Brown 2008). The first step in overhauling the Special Use Permit allocation system is to develop better procedures for inventorying and monitoring permit holders.

This study focuses on developing a systematic approach to allocating SUPs, but individual permit officials and land managers can take their own preliminary steps to assess their sites' recreation supply and demand. Irland (1979) asserts, "Free availability of wilderness recreation has led to an excess of demand over supply, in effect changing the quality of the service provided." Recreation research provides various methodologies for monitoring different aspects of use (demand) (O'Riordon and Sewell 1981, Holdgate 1984). Individual permit sites can also create an inventory of their resources (supply). They can determine ecological and social carrying capacities and conduct needs assessments to analyze supply versus demand. Data for these inventories have already been collected in some areas over the last several years using survey instruments. These inventories can also draw upon existing recreation use data from the National Visitor Use Monitoring process (NVUM). Analysis of NVUM data can help predict how changes to the Special Use Permitting process will affect outfitter guides and end users at individual sites.

2.0 LITERATURE REVIEW

2.1 Past Studies Concerning Special Use Permit Distribution

Fairfax and Ingram (1981), McNeely and Thorsell (1992), and Watson et al. (2000) conducted site-specific and/or event-specific studies related to the Recreation Special Use Permit distribution process. However, research related to developing a universal,

systematic approach to permit allocation has been strictly observational. This study is trying to determine the factors that would allow a permitting allocation and management framework to be both effective and versatile.

2.2 The Necessity, Constraints, and Benefits of a Permit System for Managers

As explained in the introduction, it is the land manager's job to balance supply and demand through the permitting process by understanding the ecological capacity of the resources and the demand for resource access and use by both permit holders and the public. As the human population has increased, the number of visitors to protected areas has continued to rise (Holdgate 1984, IUCN 1984, Watson et al. 2000, Collins and Brown 2007). Because this increase will inevitably affect most public lands, strategic partnerships would be helpful across the public forest system (Irland 1979). A good use-regulation system also has a social impact as far as the visitor *experience* is concerned. Therefore, it is important to understand an area's social carrying capacity (Manning and Lawson 2002).

3.0 METHODS

3.1 Study Site

This study was conducted over the telephone with people in charge of Special Use Permits on National Forests in Oregon, Washington, and Colorado (Forest Service Regions 6 and 2).

3.2 Procedures

The authors first wanted to understand current permitting procedures on public lands by collecting information from permitting officials and land managers. Before questioning the managers, we developed the following questions and researched them as a precursor to guide the study:

- RQ1: Why is a system of use regulation necessary on public land?
- RQ2: Why is a permit process beneficial to managers?
- RQ3: What are the main changes to the Federal Register?
- RQ4: What are the proposed goals of the changes?

RQ5: Who else does the management of an area need to keep in mind about how the various changes will affect them?

RQ6: What initial steps of action are needed?

We then formulated 12 open-ended questions and interviewed 20 people in charge of recreational Special Use Permit distribution (100-percent response rate). Interviewees' responses were typed into document form and then compared and contrasted as we looked for similar constraints or opinions. The goal was to identify key personnel in the permitting process and variation in the Special Use Permit distribution process, and to gain a better understanding of the realities of permit distribution.

4.0 RESULTS AND DISCUSSION

Following are the phone interview questions and a summary of the responses.

Question 1. Who handles the distribution of recreation special use permits for this forest?

Realty Specialists, Special Use Coordinators, Forest Supervisors, and Forest Technicians. Titles varied by forest size and visitation rates. For example, in smaller areas with less visitation, permit distribution would be a duty assigned under another job title, rather than a job in itself.

Question 2. What activities or events are managed under the Recreation-Specific Special Use Permitting process?

Outfitters (any kind of recreation retail or supply), Guides (personal, nonprofit, and commercial), Recreation Events, Recreation Residences, and Concessions (campgrounds).

Question 3. How many special use permits does your forest manage per year?

Varies by forest, ranging from 90 to 390 recreation-specific SUPs. The percentage of SUPs that were recreation-specific out of the total number of SUPs varied by the area as well, and seemed to have more to do with the visitation rate than with the size of the area.

Question 4. Has that number changed in the past few years, and why?

About half of the managers responded, "Yes, the number of SUPs went up." There was no pattern to the amount of the increase, but no dramatic increases were reported. The other half of the managers reported that the number of permits had decreased slightly or stayed the same.

Question 5. Does your forest use any other processes, such as concessions or cooperative agreements, to manage various uses of the forest?

Most respondents said that they used campground concessions. Most areas, even with multiple camping sites, seemed to have all sites under one concession permit.

Question 6. Are there any limits on the numbers of special use permits issued?

The answers varied by forest for numerous reasons. The majority said that there were limits because capacity either had been reached or in some cases had been breached for a while. Carrying capacity in some areas had not yet been measured and no permits were being distributed for those areas.

Question 7. Are there limits on the numbers of users allowed under any of your special use permits (e.g., a limited number of rafters per day)?

All managers with wilderness areas reported adhering to federal regulations regarding group size in wilderness areas. Most water recreation areas limited the number of rafts per day. Some bigger areas reported setting limits on holidays and at peak-season times.

Question 8. Have requests for special use permits been denied in your forest?

Nearly all managers said yes. The main reasons given were to preserve habitat and to avoid activities that could be executed on private land. All managers reported using a screening process to filter out the most inappropriate requests before they had to deny them.

Question 9. Are you experiencing any problems administering your special use permit program?

All said yes. Most, if not all, managers stated that their main obstacles were lack of time, lack of personnel, and lack of funds and resources.

Question 10. Do you believe that SUPs are distributed fairly on your forest?

Most said something like “as well as they can be” or “better than they used to be.” Most areas, if not all, would benefit from a needs assessment or capacity analysis in at least one section of the forest or with regards to specific resources to properly allocate the permits.

Question 11. How well do you believe your forest’s existing SUP process meets the needs of your users (and potential users)?

Most managers said “well.” Where there is unmet demand for resource access or use, the excess demand comes from the outfitters and guides, not from the general public.

Question 12. Are you aware of the changes in the SUP process that were outlined in the latest Federal Register? How do you feel about them?

All said yes. Most agreed that the proposed changes would eventually be helpful but were dreading the amount of work (with already limited resources) it will take to rewrite their processes and incorporate the changes.

In summary, there is some variation in how permits are allocated and distributed on different forests and there are some constraints to implementing changes in the process from forest to forest. The consensus seems to be that the personnel in charge of distributing permits are already consumed by their daily duties and would need help (in the form of more funds or hands) to implement the proposed changes—even if the goal of the changes is to maximize efficiency to create more time and funds.

According to Harrison and colleagues (1982), the continued expansion of protected areas will require a clear set of goals and an “increased investment in human resources, in the development of enterprises . . . , in education, and in research aimed at producing improved means of management.” This ‘investment’ addresses the collective management concern of being asked to do more with an already insufficient supply of time and

personnel, but “such an investment would be well repaid by human societies living in a better balance with their environment” (Harrison et al. 1982).

5.0 LIMITATIONS OF THE RESEARCH

An obvious limitation of this study is the one-sided approach created by concentrating on only the managers’ point of view. As stated previously, these changes will greatly affect outfitters/guides, visitors who use their services, and possibly other individual users sharing the area. Therefore, to best gauge the effects of use regulation and opinions on the proposed changes, similar research is needed to obtain feedback and opinions from these other concerned groups.

Another limitation is that the study was conducted in one specific corner of the United States. Although there is variation among the sizes and resource features of the National Forests in the study area, other forests may face different limitations, such as climate or cultural constraints.

Last, this is a preliminary study. Using information from the research about current permit distribution processes, future research should seek more specific information about potential or actual changes to the permit allocation process. Future research could also focus on the reasons or motivations for different management decisions related to permits.

6.0 NEXT STEPS

Management results and demographic information from the National Visitor Use Monitoring data will provide background information for a mail survey to assess the situation from the outfitters and guides’ responses. The research instrument will be revised and the same managers will be asked to participate in a follow-up study using the Delphi Method. Results of the continuous rounds of questionnaires required by the Delphi process, along with the research literature, will be analyzed to identify potential key factors in a more universal plan to regulate use.

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CHANGES IN NATIONAL PARK VISITATION (2000-2008) AND INTEREST IN OUTDOOR ACTIVITIES (1993-2008)

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Abstract.—This paper addresses Pergams and Zaradic's (2006) assertions that recent national park visitation has declined sharply and that these declines are directly related to the increased use of electronic media and passive forms of entertainment. We analyzed two large, national datasets that have used consistently replicated methods of annual data collection over a lengthy period. Although we found evidence of some decline in national park visitation between 2000 and 2008, the declines were not dramatic. Analysis of data between 1993 and 2008 showed no evidence of declining interest in travel, outdoor recreation, and media-related activities among people who are interested in wildlife and the environment.

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BACKGROUND AND LITERATURE REVIEW

The overall purpose of the present research is to test the assertions made by Pergams and Zaradic (2006) regarding national park visitation, interest in environmental issues, and participation in selected outdoor recreational activities. Pergams and Zaradic (2006) claim that the U.S. population and culture are moving away from "biophilia" into an era of "videophilia," a growing interest in being entertained by passive media or video experiences instead of direct engagement with nature. They attribute a decline in

national park visitation in recent years to this increase in videophilia. They claim that the decrease in the rate of visiting national parks is inversely correlated with increases in television viewing, video game playing, movie watching at home, theatre attendance, Internet use, oil prices, foreign travel, and extreme outdoor recreation, such as hiking the Appalachian Trail.

The Pergams and Zaradic (2006) research has some basic methodological problems. First, the authors selected data from a variety of unrelated datasets and sources. In addition, their analysis assumes or asserts *causation* where there is only *correlation* between national park visitation numbers and trends in different leisure and recreation activities. They suggest that their findings do not bode well for the future of biodiversity conservation, but their study period extended only until 2003 and included overall trend data only from 1988 to 2003. Many digital media activities did not become popular until the mid-to late-1990s and substantial long-term trend data are simply not available to analyze for long-term trends. In addition, Pergams and Zaradic lumped all households and participants into one large group and assumed that changes in leisure and recreation patterns were equally distributed across all demographic segments, household types, and regions of the country. Finally, they did not consider potentially useful data on youth participation in outdoor recreation from such sources as the Boy and Girl Scouts Programs, the National Camping Association, and the National Sporting Goods Association.

Since the release of the article, other recreation researchers have given considerable attention to the findings and many authors have criticized Pergams and Zaradic's (2006) methodology and conclusions. Jacobs and Manfredo (2008) noted that Pergams and Zaradic measured participation in a few types of recreation but extrapolate to all forms of outdoor recreation. In addition, Jacobs and Manfredo (2008) refute Pergams and Zaradic's claim that people's support for biodiversity is likely to be connected to their participation in outdoor recreation. They acknowledge that Pergams and Zaradic

raise important and compelling questions about the decline of selected forms of outdoor recreation but suggest that it would be premature to accept Pergams and Zaradic's far-reaching conclusions.

Cordell (2004) found that nature-based recreation activities tracked by the *National Survey on Recreation and the Environment* were still growing through the first part of the current decade. Citing this research, Cordell et al. (2008) note that almost 70 million people age 16 or older reported visiting a wilderness or other wildland area or went hiking in the last year and even larger numbers reported participating in nature-based activities such as bird watching or viewing natural scenery. However, Cordell et al. (2008) indicate that the trends in public lands visitation have been unclear and that declines in visitation to wilderness areas have been particularly unsettling. They note that visitation to state parks, national parks, and national wildlife refuges had remained relatively stable since the mid-1990s following long-term growth from the 1960s through the 1980s. The authors point out that many people who live near parks or protected areas may be entering those places without being counted or observed. They also conclude that the increase in nonconsumptive outdoor activities (e.g., observing wildlife or scenery) has more than offset the decline in consumptive activities (such as hunting and fishing) so that there is actually a net *increase* in outdoor activity levels.

In a comprehensive study of outdoor recreation in the United States from 1965 to 2007, Siikamäki (2009) found that per-capita time spent on outdoor recreation more than doubled over that period and that increased participation rates were the main driver. However, the author also noted that in the last decade or two, per-capita time spent on outdoor recreation has stayed constant or declined slightly.

Balmford et al. (2009) acknowledged the declining number of visits to natural areas in the U.S. and Japan. Their analysis of trends in visitor numbers at 280 protected areas in 20 countries, however, found increased visitation rates in 15 countries. They concluded that nature-related tourism and recreation are not declining everywhere and still have considerable potential to

generate funds for conservation and shape attitudes toward the environment.

2.0 METHODS

We analyzed data from two large national datasets, Lifestyle Market Analyst (1993-2008) from Standard Rate and Data Service (SRDS) and Mediamark's Topline Research Reports (TRR) (2000-2008), to examine national park visitation rates and people's leisure and recreation choices. Where possible, we also addressed the larger issue of whether interest in outdoor recreation and national park visitation can be linked to people's increased interest in media-related activities.

The Mediamark and SRDS datasets contain individual and household data collected yearly in a consistently replicated manner. Mediamark's TRR samples more than 20,000 subjects per year on self-reported park visitation and other leisure and recreation activities. The Mediamark survey collects data on both activity interests and media use patterns from the same individuals. Likewise, Lifestyle Market Analyst (1993-2008) directly measures interest in the environment and an array of lifestyle pursuits, including outdoor recreation participation and media use patterns. In the SRDS data, these variables are measured within each household and are directly linked to each other so the data may be examined for "cross-market" or "within-market" interests or activity pursuits. The SRDS dataset also allows examination of interest in and use of new media (i.e., Internet use, cable television viewing, and viewing VCR/DVD tapes) and can link those variables to interest in the environment. For example, the SRDS data can help answer these questions: Are people who are interested in the environment also participating in outdoor recreation activities and spending time on a variety of new media interests? Have particular interests and activities increased or declined in recent years? Are individuals who use evolving media/video/digital devices also pursuing outdoor recreation and are they interested in the environment?

For this study, we used several variables to describe trends in the data. The descriptive statistics include an average annual adjusted percent-change rate for each dataset. Lifestyle Market Analyst data use a 3-year

Table 1.—Estimated visitation to national parks, 2000 to 2008, including breakdown by age categories and education level*

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	Chg Rate** '00-'08
Estimated Total Adult Population ('000)	201,715	202,753	204,964	209,657	213,454	215,800	218,289	220,847	222,210	1.2%
Estimated Number of National Park Visits	11,920	12,490	12,009	12,237	11,302	11,908	12,148	12,410	11,578	-0.2%
Total Adult National Park Visitation Rate (%)	5.9	6.2	5.9	5.8	5.3	5.5	5.6	5.6	5.2	-1.5%
Adults age 18-24	4.5	4.6	4.2	4.9	3.5	3.8	4.0	2.8	3.4	-1.6%
Adults age 25-34	5.4	5.9	5.7	6.7	6.0	4.6	5.1	6.0	5.1	0.4%
Adults age 35-44	7.4	7.4	7.9	7.4	6.3	7.2	6.8	7.2	6.7	-0.8%
Adults age 45-54	7.8	8.4	7.0	6.5	6.5	7.5	6.9	6.6	6.2	-2.4%
Adults age 55-64	5.9	7.0	5.7	5.9	5.6	5.5	5.6	5.9	5.6	-0.1%
Adults age 65+	3.4	2.8	3.4	2.6	2.8	3.4	4.2	4.1	3.5	2.0%
Adults age 18-34	5.1	5.4	5.1	6.0	5.0	4.3	4.6	4.7	4.4	-1.2%
Adults age 18-49	6.3	6.5	6.5	6.6	5.7	5.8	5.7	5.8	5.4	-1.8%
Adults age 25-54	6.9	7.3	6.9	6.9	6.3	6.5	6.3	6.6	6.0	-1.6%
Educ: did not graduate HS	3.1	2.6	2.4	2.6	1.7	1.7	2.5	1.8	1.8	-3.9%
Educ: graduated high school	4.5	4.5	4.8	4.6	3.9	4.2	4.3	4.3	3.6	-2.4%
Educ: attended college	6.9	7.1	6.4	6.1	6.4	6.4	5.9	6.0	6.1	-1.4%
Educ: graduated college plus	9.0	10.0	9.1	9.4	8.3	8.7	8.8	9.1	8.2	-0.9%
Educ: post-graduate	na	10.6	9.8	10.0	9.4	9.2	9.6	9.4	8.8	-2.5%

*Source: Mediamark's Topline Research Reports, 2000 to 2008; interpretation of data by authors.

**Chg. Rate = Average Annual Change Rate for period covered.

moving average—i.e., 1995 data would represent the average participation rate for 1993, 1994, and 1995. Participation rates of individuals (used for TRR data) and households (used for SRDS data) are treated as primary variables for examining the overall trends. SRDS data alone were used to conduct cross-market or within-market analysis of interest levels and household participation in various activities. Where possible, changes in participation were compared to national population growth and percentage change in number of households.

3.0 RESULTS

We present only some of the data in tables here; full data tables are available from the authors. As a reference point for the analysis of TRR data, the estimated U.S. population increased at an average annual adjusted rate of 1.2 percent per year from 2000 to 2008 (Table 1). Any rates not equaling or exceeding this rate indicate real declines in visitation or participation. As a reference point

for the trends in the Lifestyle Market Analyst data, the number of households in the U.S. grew by 1.1 percent per year from 1993 to 2008.

3.1 National Park Visitation Trends, 2000 to 2008

Using the TRR data (Mediamark 2000-2008), we found that annual national park visitation rates between 2000 and 2008 declined by an average of about 1.5 percent per year while the actual number of visitors declined by about 0.2 percent per year (Table 1). Approximately 5.9 percent of individuals had visited national parks in the past 12 months in 2000 and this percentage decreased to 5.2 percent by 2008. From 2000 to 2004, the participation rate steadily declined from 5.9 percent to 5.3 percent; it rebounded slightly to 5.6 percent in 2006-2007 and fell again to 5.2 percent in 2008. In 2000, an estimated 11.9 million individuals had visited a national park in the previous 12 months; by 2008, this number had declined to 11.6 million individuals.

3.2 National Park Visitation Trends by Adult Age Groups, 2000 to 2008

National park participation rates and number of visits were not evenly distributed across age groups (Table 1). Between 2000 and 2008, *participation rates* declined the most among adults age 45-54 (decline of 2.0 percent) and young adults age 18-24 (decline of 1.6 percent). Rate changes among other age groups were negligible and rates actually grew for adults 65 and older (increase of 2.0 percent) and age 25-34 (increase of 0.4 percent). When the age categories are broadened, the data show that adults over 55 had the largest estimated increase in *number of visits*. Between 2000 and 2008, the estimated number of 55- to 64-year-olds visiting national parks increased by 3.6 percent per year (from 1.4 million to 1.8 million) and the number of people over 65 visiting national parks increased by 3.1 percent per year.

3.3 National Park Visitation Trends by Education Status, 2000 to 2008

When we examined 2000-2008 participation rates across the education spectrum, we saw no definitive trends (Table 1). Participation rates declined across all education categories. The strongest declines occurred among adults who did not graduate from high school (a decline of 3.9 percent per year) and the weakest decline was among individuals with a college degree plus additional schooling (average annual decline of 0.9 percent). More revealing is that the rates of national park visitation were, on average, three to four times higher among the most educated groups than among the least educated group.

3.4 National Park Visitation Trends by Occupation, 2000 to 2008

National park visitation rates were also not evenly distributed across occupational groups of U.S. adults (Table 2). Participation rates declined the most among adults who held clerical/sales/technical positions (decline of 2.6 percent per year) and professional positions (decline of 2.1 percent per year). The participation rates of adults in precision/crafts/repair occupations actually increased slightly (0.2-percent increase per year) between 2000 and 2008.

3.5 National Park Visitation Trends by Regions, 2000 to 2008

National park visitation rates varied by region (Table 2). Regional participation rates were highest in the West in 2000 (6.6 percent) and 2008 (5.8 percent), but participation rates in the North Central region were the highest of all regions in several of the intervening years. Between 2000 and 2008, participation rates declined the most (4.1 percent per year) among adults who lived in the South and declined the least (0.6 percent per year) among adults who lived in the West. Participation rates actually grew in the Northeast by 1.5 percent per year between 2000 and 2008. Participation rates of adults living in the South was 6.3 percent in 2000 but dropped steadily to 4.4 percent by 2008 (except for a slight up-tick in 2006). Participation rates of adults who lived in the Northeast also fluctuated from year to year between 2000 and 2008.

3.6 National Park Visitation Trends by Household Income, 2003 to 2008

National park visitation rates were also not evenly distributed across household income categories over time (Table 2). Participation rates declined the most among adults from households with gross incomes of \$50,000-\$59,990 (a decline of 1.3 percent per year). Overall participation rates were highest (9.7 percent in 2003 and 9.9 percent in 2008) among households in the highest income category (\$150,000 per year or more). However, the lowest income groups had the most robust increases in national park visitation rates. For those with annual household incomes under \$20,000, participation rates increased by 27.6 percent per year (from 1.4 percent in 2000 to 3.7 percent in 2008)—almost tripling during the period. Participation increased 10.2 percent per year in households with incomes of \$20,000 to \$29,999, increased by 8.9 percent per year in households making \$30,000 to \$39,999, and increased by 14.7 percent per year in households earning \$40,000 to \$49,999. However, these rates were still less than half the rates of the wealthiest households in almost every year.

Table 2.—Estimated national park visitation rates, 2000 to 2008, by occupation, Census region, gross household income, and race*

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	Chg Rate** '00-'08
Total Adult National Park Visitation Rate (%)	5.9	6.2	5.9	5.8	5.3	5.5	5.6	5.6	5.2	-1.5%
Occupation: professional	10.3	11.3	10.2	10.6	8.6	9.7	9.6	8.4	8.3	-2.1%
Occupation: executive/ admin/mgr	8.5	9.4	9.2	8.3	7.7	7.8	8.2	8.6	8.1	-0.4%
Occupation: clerical/sales/ tech	6.3	6.9	6.5	5.8	5.7	6.0	6.2	5.7	5.0	-2.6%
Occupation: precision/ crafts/repair	5.5	5.0	4.1	5.1	5.3	6.0	4.1	5.1	4.8	0.2%
Occupation: other	4.8	4.7	5.1	4.7	4.7	4.1	4.4	4.6	4.0	-1.9%
Census Region: Northeast	5.1	5.7	5.7	6.1	5.9	5.9	6.1	6.0	5.7	1.5%
Census Region: South	6.3	6.2	5.4	5.3	4.3	4.3	4.6	4.4	4.4	-4.1%
Census Region: North Central	5.7	6.7	5.7	6.2	6.0	6.0	6.9	6.7	5.6	0.5%
Census Region: West	6.6	5.9	7.0	6.2	5.7	6.7	5.4	6.3	5.8	-0.6%
HHI \$150K +	na	na	na	9.7	8.1	9.7	8.8	9.7	9.9	1.3%
HHI \$75K - \$149K	na	na	na	8.7	7.6	8.0	8.2	9.5	9.1	1.4%
HHI \$60-\$74.9K	na	na	na	7.6	7.4	6.5	6.9	9.1	8.7	3.8%
HHI \$50-\$59.9K	na	na	na	7.8	6.3	7.7	6.0	7.0	6.7	-1.3%
HHI \$40-\$49.9K	na	na	na	4.4	5.8	3.7	5.6	7.4	7.0	14.7%
HHI \$30-\$39.9K	na	na	na	4.2	3.4	4.0	3.8	6.5	5.2	8.9%
HHI \$20-\$29.9K	na	na	na	3.7	3.0	2.5	2.6	5.1	4.4	10.2%
HHI <\$20K	na	na	na	1.4	1.4	2.3	1.8	3.3	3.7	27.6%
Race: White	6.3	6.6	8.1	6.4	5.9	6.1	6.3	6.5	6.1	0.3%
Race: Black	2.8	3.2	2.3	2.3	2.0	2.7	2.3	1.4	1.0	-9.3%
Race: Asian	na	6.7	4.5	5.0	6.8	6.9	5.9	6.0	4.2	-3.9%
Race: other	na	4.9	4.8	2.0	3.7	3.5	3.4	3.1	5.3	11.2%
Spanish-speaking Hshld	4.8	4.3	5.7	3.4	1.4	4.1	4.5	4.2	2.9	11.0%

*Source: Mediamark's Topline Research Reports, 2000 to 2008; interpretation of data by authors.

**Chg. Rate = Average Annual Change Rate for period covered.

3.7 National Park Visitation Trends by Racial Status, 2000 to 2008

National park visitation rates varied by racial group (Table 2). Participation rates declined the most (9.3 percent per year) among African American adults, from 2.8 percent in 2000 to 1.0 percent in 2008. Rates also declined among Asian American adults by 3.9 percent per year, from 6.7 percent in 2001 to 4.2 percent in 2008. Rates were fairly stable among white adults, growing at an average annual rate of 0.3 percent. National park visitation rates by Hispanic or Spanish-

speaking households fluctuated the most of all racial groups; their participation rates were as high as 5.7 percent in 2002 and as low as 1.4 percent in 2004.

3.8 National Park Visitation Trends by TV-Viewing Quintile Groups, 2000 to 2008

National park visitation rates were also not evenly distributed across adults with different TV-viewing habits (Table 3). Mediamark divides survey respondents into quintile groups based on self-reported hours of daily TV

Table 3.—Estimated national park visitation rates, 2000 to 2008, by Internet user category and TV-viewing category*

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	Chg Rate** '00-'08
Total Adult National Park Visitation Rate (%)	5.9	6.2	5.9	5.8	5.3	5.5	5.6	5.6	5.2	-1.5%
TV (Total) Quintile I (Heavy)	3.9	4.1	5.7	3.9	3.4	3.4	3.4	3.8	3.0	-1.2%
TV (Total) Quintile II	5.6	5.8	7.4	5.1	4.2	4.8	5.6	4.5	4.6	-0.5%
TV (Total) Quintile III	6.2	6.3	5.9	6.0	6.0	6.4	6.3	6.4	6.0	-0.3%
TV (Total) Quintile IV	7.2	7.0	4.9	5.8	6.9	6.2	6.1	6.6	5.7	-1.6%
TV (Total) Quintile V (Light)	6.6	7.6	3.4	8.4	6.0	6.8	6.4	6.8	6.8	11.5%
										Chg Rate '04-'08
Internet Quintile I (Heavy)	na	na	na	na	8.2	8.1	7.3	7.8	7.3	-2.7%
Internet Quintile II	na	na	na	na	6.7	7.5	7.9	6.6	6.6	0.2%
Internet Quintile III	na	na	na	na	6.5	5.9	6.0	6.5	6.0	-1.7%
Internet Quintile IV	na	na	na	na	2.6	3.4	3.7	4.0	4.0	11.9%
Internet Quintile V (Light)	na	na	na	na	2.5	2.7	3.0	3.2	2.2	-1.4%

*Source: Mediamark's Topline Research Reports, 2000 to 2008; interpretation of data by authors.

**Chg. Rate = Average Annual Change Rate for period covered.

watching (from heaviest to lightest viewing); a quintile represents 20 percent of respondents. Those who watched the most television (Quintile I) were the least likely to visit national parks in every year between 2000 and 2008. Between 2000 and 2008, national park visitation rates declined among all but the lightest television-viewing group (Quintile V); the declines were nevertheless small (less than 2 percent per year). For those who watch the most television (Quintile I), national park visitation rates declined between 2000 and 2008 at a rate of 1.2 percent per year (from 3.9 percent in 2000 to 3.0 percent in 2008). Among those who watched the least television (Quintile V), participation rates increased from 6.6 percent in 2000 to 6.8 percent in 2008 (an average annual increase of 11.5 percent).

3.9 National Park Visitation Trends by Internet Use Quintile Groups, 2004 to 2008

National park visitation rates were unevenly distributed across U.S. adults with different Internet use habits (Table 3). Here, again, Mediamark provides participation rates of Internet use habits in heavy to light quintile

groups, but the data have been collected only since 2004. For those with the heaviest Internet use (Quintile I), national park visitation rates declined at a rate of 2.7 percent per year from 2004 to 2008. In 2004, the heaviest Internet users had participation rates of 8.2 percent, declining to 7.3 percent in 2008. National park visitation rates among those who used the Internet the least (Quintile V) declined as well, from 2.5 percent in 2004 to 2.2 percent in 2008.

4.0 ADDITIONAL RESULTS

Similar patterns were noted in use of other media, including newspaper and magazine reading behavior and its relationship to national park visitation. (Data were not provided in table form due to space limitations.) Unfortunately, TRR does not report on video game playing, DVD purchases, or watching/listening to other media formats in a way that can be directly linked to national park visitation. However, SRDS provides data from 1993 through 2008 on U.S. households' interest in the environment and wildlife, and these data are directly linked to a wide variety of outdoor activities and media use habits.

For this section of the trend analysis, we selected the following groupings of activities: travel-related activities (domestic travel, vacation travel, foreign travel, and cruise ship travel); outdoor recreation activities (camping/hiking, fishing, hunting/shooting, snow skiing, and recreation vehicle use); and media/video-related activities (subscription to cable television, video game playing, and online Internet use). Trends in each of these activity categories are reported with the trend years of available data noted. Data for some activities were not available for the entire period of 1993 to 2008.

4.1 Interest in Environment and Wildlife, 1993 to 2008

National park visitation rates in households with an interest in the environment and wildlife declined only slightly (by about 0.5 percent per year) between 1993 and 2008. Among this group, the national park visitation rate was 16.9 percent in 1993, 18.6 percent in 2000, and 15.0 percent in 2008. Between 1993 and 2008, the actual number of people surveyed who expressed interest in the environment and wildlife grew slightly by 0.7 percent per year, from an estimated 15.93 million households in 1993 to 17.05 million households in 2008 (with an in-between peak of 19.6 million households in 2001).

4.2 Interest in Environment and Wildlife by Travel Related Activities, 1993 to 2008

Do people who are interested in the environment and wildlife travel? Are those rates increasing or declining? The percent of households that were interested in the environment and wildlife and that engaged in domestic travel increased at an average annual rate of 1.0 percent; the actual number of these households grew at a rate of 1.9 percent. In 1993, 49.3 percent of households interested in the environment and wildlife engaged in domestic travel and by 2008, 56.8 percent traveled domestically.

The percentage of households that were interested in the environment and wildlife and that engaged in vacation travel declined at an average annual rate of 0.05 percent (data available only from 1995 to 2005) and the actual number of these households grew at a rate of 0.6 percent per year. In 1995, 51.7 percent of households interested

in the environment and wildlife engaged in vacation travel and by 2005, 48.8 percent engaged in vacation travel.

The percent of households that were interested in the environment and wildlife that engaged in foreign travel increased at an average annual rate of 1.9 percent and the actual number of these households grew at a rate of 2.7 percent per year. In 1993, 21.6 percent of households interested in the environment and wildlife engaged in foreign travel and by 2008, 28.5 percent traveled abroad.

Finally, cruise ship travel was examined with data from 1999 through 2008. The percent of households that were interested in the environment and wildlife that engaged in cruise ship travel increased at an average annual rate of 2.7 percent (data available only from 1999 to 2008) and the actual number of these households grew 4.4 percent per year. In 1999, 18.2 percent of households interested in the environment and wildlife engaged in cruise ship travel. In 2008, 22.4 percent went on a cruise ship and that percentage was as high as 24.4 percent in 2006. Among households interested in the environment and wildlife, the growth rate of only two of the four travel-related activities, cruise ship travel and foreign travel, exceeded the average annual household growth rate of 1.2 percent.

4.3 Interest in Environment and Wildlife by Outdoor Recreation Activities, 1993 to 2008

The percent of households that were interested in the environment and wildlife and that engaged in camping/hiking grew at an average annual rate of 1.6 percent. The actual number of these households grew 2.4 percent per year. In 1995, 40.2 percent of households interested in the environment and wildlife went hiking and/or camping and by 2008, 50.8 percent engaged in hiking/camping.

The percent of households that were interested in the environment and wildlife and engaged in fishing rose at an average annual rate of 3.1 percent and the actual number of these households grew 4.0 percent per year. In 1993, 33.3 percent of households interested in the environment and wildlife went fishing and by 2008, 51.1 percent engaged in fishing.

The percent of households that were interested in the environment and wildlife that engaged in hunting/shooting activities increased at an average of 2.1 percent annually and the actual number of these households grew 3.0 percent per year. In 1993, 28.4 percent of households interested in the environment and wildlife engaged in hunting/shooting activities and by 2008, 36.9 percent engaged in these activities.

The percent of households that were interested in the environment and wildlife that pursued snow skiing activities increased at an average annual rate of 1.3 percent and the actual number of these households grew at the rate of 2.1 percent per year. In 1995, 11.6 percent of households interested in the environment and wildlife went snow skiing and by 2008, 13.3 percent did so.

Finally, the percent of households that were interested in the environment and wildlife that engaged in use of recreational vehicles increased at an average annual rate of 3.3 percent and the actual number of these households grew 4.6 percent annually. In 1993, 12.9 percent of households interested in the environment and wildlife used recreational vehicles and by 2008, 20.1 percent engaged in these activities. In sum, among households interested in the environment and wildlife, all five outdoor recreation activity participation rates grew faster than the average per-year household growth rate.

4.4 Interest in Environment and Wildlife by Media and Video Use Activities, 1993 to 2008

We examined three activities: watching/subscribing to cable television, playing videogames (both activities had data available from 1993 through 2005), and subscribing to an online Internet service (data available from 2002 through 2008). All three of the media/video activities among households interested in the environment and wildlife grew at higher rates than the average per year household growth rate.

The percent of households that were interested in the environment and wildlife that engaged in watching/subscribing to cable television grew at an average annual rate of 2.8 percent per year and the actual number of these households grew 3.5 percent per year. In 1993,

44.5 percent of households interested in the environment and wildlife watched and/or subscribed to cable television and by 2005, 59 percent engaged in these activities. The peak was in 2001, when 67.3 percent of households reported watching/subscribing to cable television.

The percent of households that were interested in the environment and wildlife and played video games grew at an average annual rate of 1.8 percent and the actual number of these households grew at the rate of 2.8 percent per year. In 1993, 14.2 percent of households interested in the environment and wildlife played video games and by 2005, 15.8 percent played them. The peak was in 2002, when 25.9 percent reported playing video games.

The percent of households that were interested in the environment and wildlife and used an online Internet service grew at an average annual rate of 2.0 percent and the actual number of these households grew 1.8 percent per year. In 2002, 61.6 percent of households interested in the environment and wildlife used an online Internet Service and by 2008 this figure grew to 69 percent. The peak was in 2007, when 71.8 percent reported using an online Internet service.

Finally, overall interest in video game playing was examined for all households between 1993 and 2005, not just those who expressed interest in the natural world. The participation rate for playing video games increased only slightly (an average of 0.9 percent per year) over this period and did not keep pace with the overall growth of households. The peak year for video game playing was 2002 (18.2 percent of households, a total of 19.5 million households). Video game playing has waned since then and stood at 10.9 percent of all households, or 17.6 million households, in 2005. In 1993, the percentage of households that played video games and were also interested in the environment and wildlife was 21.1 percent and by 2005 it was 21.2 percent, barely any change.

Complete data were not available for online Internet subscriptions and television cable viewing for further analysis. Tables on trends in “cross-market” and “within-market” media use are available from the authors.

5.0 DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

Participation rates for visitation to national parks between 2000 and 2008 have declined, but the decline during this period has not been dramatic. The numbers also suggest that some of the decline has been in the volume of visits per household and part of the decline may be reflected in the findings of Siikamäki (2009), who noted that active participants spent less time per visit while participation rates had not changed substantially.

Decline in visitation has also not been evenly distributed across the demographic variables examined here. Notably, park visitation declined most dramatically among middle-aged adults (45 to 54 years old) and young adults (age 18 to 24). The growth that did occur was among people age 55 and over. The two occupational categories with the greatest declines in park visitation rates were professionals and clerical/sales/technical professions. The fastest-growing region of the country, the South, is also the region where park visitation rates declined the most. In fact, of all of the demographic variables, this group experienced the greatest decline. Surprisingly, while visits by those at the middle-income level of \$50,000 to \$59,999 declined the most among the income categories, households with incomes less than \$50,000 actually had some of the highest increases in park visitation rates. Perhaps lower-income households are visiting the parks for the “good value” they provide for the expense of the trip.

While there is some support for Pergams and Zaradic’s (2006) assertion that national park visitation is declining, some of the declines may also be attributed to the effects of the 9-11 terrorist attacks and the beginning of the downturn in the economy after Sept. 11, 2001. Among households that expressed an interest in the environment and wildlife, only vacation travel decreased between 1995 and 2005 and that overall decline was slight. All other activities, especially foreign travel and cruise ship travel, increased substantially among households that expressed an interest in wildlife and the environment. In addition, we found no evidence that those households interested in the environment and wildlife were also pulling away from outdoor recreation activities. In fact, participation

rates for each of the five outdoor activities examined here grew much faster than overall household growth rates. We conclude that the causes of declining national park visitation are more complicated than Pergams and Zaradic suggest and are not easily linked to outdoor recreation participation and use of electronic media and passive entertainment. More research is needed, and more direct linkage within measured households and among participants is necessary.

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RECREATION TRAILS IN MAINE AND NEW HAMPSHIRE: A COMPARISON OF MOTORIZED, NON-MOTORIZED, AND NON-MECHANIZED TRAILS

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Abstract.—We sampled 112 trail segments in Maine and New Hampshire to assess the impact of motorized and non-motorized recreation on trail conditions and stream sedimentation. On each segment, we assessed physical trail conditions (width, cross-sectional area, occurrence of excessively muddy and rutted/eroded sections), presence of trash, and sedimentation at stream crossings. Motorized trails were significantly wider and had significantly greater cross-sectional area, more rutted sections, and more trash than both non-motorized and non-mechanized trails. Non-mechanized trails had the highest density of excessively muddy sections. All trail types (non-mechanized, non-motorized, and motorized) had sections that contributed sediment to streams and 9 percent of stream crossings had catastrophic sediment additions (significantly altered stream morphology). The data also show significant differences in physical parameters among trail types, but both past land use and current recreational use may contribute to these differences.

1.0 INTRODUCTION

Public recreation is one of the four greatest threats to the health of U.S. forests (Bosworth 2007). In the Northeast, recreational uses on private and public forest lands are rapidly increasing, especially use of off-road vehicles (ORVs) (Maine ATV Task Force 2003, Jensen and Guthrie 2006). As the demand for recreation grows, managers must balance the need for high quality recreational experiences (Manfredo et al. 1983) with protection of environmental values (Kuss and Grafe 1985, Hendee et al. 1990). Poorly managed recreation can have a large impact on soils (Leung and Marion 2000), water quality (Rinnella and Bogan 2003), biodiversity (Cole 1995), and wildlife (Marion and Leung

2001). Degradation of trails can also impact the quality and enjoyment of recreation experiences (Marion et al. 1993, Conrad 1997). A large majority of motorized trails in the Northeast are located on private land (Maine ATV Task Force 2003), and poor management of these trails may also jeopardize future recreational access to private land.

The goal of this study was to assess the environmental impact of motorized and non-motorized recreation trails in northern New England. Only a limited number of studies have made cross-comparisons of recreational impacts among use categories (e.g., Whittaker 1978, Wilson and Seney 1994, Deluca et al. 1998, Olive and Marion 2009). This study provides baseline information about on-the-ground trail conditions. It can help managers understand the environmental impact of different recreation types and identify specific management activities that can protect soils and water quality.

2.0 METHODS

We sampled 112 trail segments totaling 335 km of recreation trails in Maine and New Hampshire (Fig.1). These trails fell into three categories:

- 1) Motorized trails – trails primarily for all-terrain vehicles (ATVs) or snowmobiling (n=55, 164 km);
- 2) Non-motorized trails – trails permitting hiking and mountain biking (n=26, 70 km); and
- 3) Non-mechanized trails – trails permitting hiking only (n=31, 101 km).

We collected data along a trail segment either 2 km or 5 km in length. The beginning of each segment was a randomly selected distance from the start point, usually a trailhead or road crossing. We adjusted all continuous data by the length of the trail segment.

At 11 random locations along each trail segment, we measured tread width, maximum tread depth, and cross-sectional area (CSA). Width was measured

Table 1.—Average tread width, cross-sectional area (CSA), and tread depth for motorized, non-motorized, and non-mechanized recreation trails

	Tread Width (m)		CSA* (cm ³)		Max Tread Depth* (cm)	
	Mean	SE	Mean	SE	Mean	SE
Non-mechanized	0.62 ^c	(0.04)	164.2 ^c	(19.4)	4.0 ^b	(0.2)
Non-motorized	1.59 ^b	(0.22)	427.0 ^b	(50.0)	4.5 ^b	(0.3)
Motorized (all)	2.03 ^a	(0.10)	736.4 ^a	(41.7)	7.6 ^a	(0.4)

* excludes sample locations with gravel surfaces

a,b,c Different letters represent significant differences among groups.

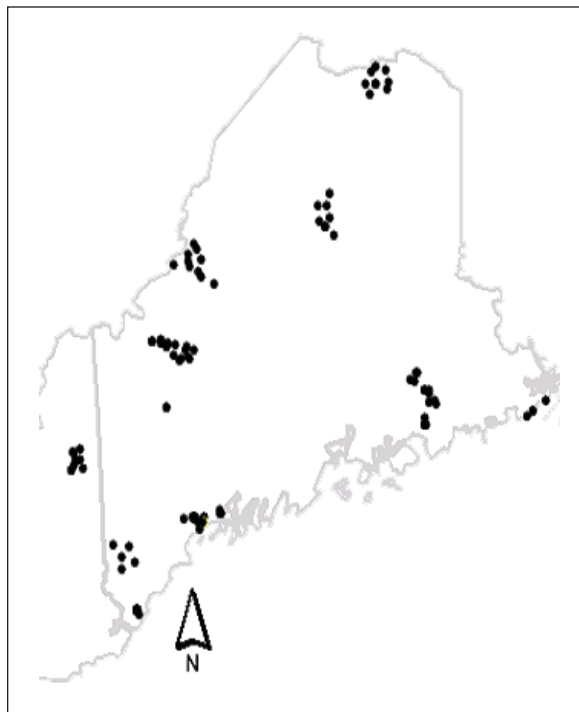


Figure 1.—Map of sampling locations in New Hampshire and Maine.

between the two most pronounced outer boundaries of visually obvious human disturbance created by trail use (Marion 2007). CSA was determined by measuring tread depth at five evenly spaced points along the entire trail boundary (adapted from Hammitt and Cole 1998). The addition of gravel to the trail surface alters the CSA of the trail and makes measurement of tread width and tread depth difficult. Therefore, we excluded sampling locations with gravel surfaces from the analysis of tread depth and CSA. With the exclusion of sampling points with a gravel surface, we retained 51 percent of sample sites on motorized trails, 83 percent on non-motorized trails, and 96 percent on non-mechanized trails. Along the entire trail segment, we tallied: the number of excessively muddy sections ≥ 3 m in length with seasonal

or permanently wet soils with imbedded foot prints or tire tracks ≥ 1.2 cm deep (based on Marion 2007); highly rutted and/or eroded sections of trail ≥ 3 m in length with tread depth > 13 cm (based on Marion 2007); and number of pieces of trash visible from the trail.

When trails crossed a stream or river > 1 m wide, we recorded the type of crossing structure (ford, culvert, or bridge) and classified the amount of sediment entering the stream as: “none” (no visible sediment entered the stream), “trace” (sediment entered the stream channel, but deposited sediment did not form an identifiable sediment fan), “measurable” (deposited sediment formed a sediment fan), or “catastrophic” (deposited sediment significantly altered channel morphology or stream flow) (classifications adapted from Ryder et al. 2006).

We used an ANOVA (PROC GLM in SAS [SAS Institute, Cary, NC 1999]) to evaluate the effect of trail type (independent variable) on trail measurements (tread width, CSA, maximum tread depth, excessively muddy and eroded/rutted trail sections, and frequency of litter). If the overall model was significant, we used a multiple comparison test (least-squared means) to test for significant differences among the trail types (motorized, non-motorized, non-mechanized).

3.0 RESULTS AND DISCUSSION

3.1 Tread Width

Motorized trails had an average tread width of 2.03 m (Table 1). Motorized trails are significantly wider than other trails because of the large size of ATVs and snowmobiles and the need for adequate space for passing and safely maneuvering these vehicles, which can travel at high rates of speed. Trail widths were similar to

Table 2.—Average cross-sectional area (CSA), maximum tread depth, and frequency of excessively wet and rutted/eroded sections of trail on ATV, snowmobile, and year-round motorized trails (ATV and snowmobile)

	CSA* (cm ³)		Max Tread Depth* (cm)		Excessively Wet (freq/km)		Rutted/Eroded (freq/km)	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
ATV	944.3 ^a	(120.8)	9.4 ^a	(0.8)	4.0 ^{a,b}	(0.5)	1.7 ^a	(0.3)
Snowmobile	542.3 ^b	(62.5)	6.7 ^b	(0.7)	5.5 ^a	(0.9)	2.0 ^a	(0.7)
Motorized, Year round	822.0 ^a	(73.9)	7.8 ^{a,b}	(0.6)	3.0 ^b	(0.6)	1.3 ^a	(0.4)

^{a,b} Different letters represent significant differences among groups.

guidelines for recreation trails in Maine, which call for ATV trails to be 1.5 m wide and snowmobile trails to be 1.8-2.4 m wide (Demrow 2002). Non-motorized trails had an average tread width of 1.59 m.

The recommended width of mountain bike trails depends on the desired difficulty of the trail. Easy trails are the widest; the International Mountain Bike Association (2004) recommends a width of 0.91-1.8 m. Demrow's (2002) guidelines suggest 1.2 m for easy mountain bike trails, 0.5-0.6 m for more difficult trails, and 0.3 m for the most difficult mountain bike trails. The average width of the trails in this study was greater than these recommendations. One advantage of wider trail width is that it may improve safety and reduce user conflicts because mountain bikers and hikers share most non-motorized trails.

Non-mechanized trails were significantly narrower than both non-motorized and motorized trails. The average tread width was 0.62 m. This width was consistent with Demrow's (2002) recommendations for Maine hiking trails (0.3-0.9 m) and with the measured tread width of hiking trails in Acadia National Park (range: 0.53-0.89 m) reported by Manning et al.(2006).

3.2 Cross-sectional Area and Tread Depth

CSA and tread depth are commonly used indicators of soil loss on trails (Jewell and Hammitt 2000).

Motorized trails had significantly greater CSA (736.4 cm²) and maximum tread depth (7.6 cm) than other trail types (Table 1). Motorized vehicles are heavy and apply 5-10 times greater pressure than does foot travel (Liddle 1997). ATV trails are particularly vulnerable to

soil disturbance because tires break down soil structure resulting in erosion, compaction, and rutting (Meyer 2002).

We also found that ATV trails had significantly greater CSA (944.3 cm²) and maximum tread depth (9.4 cm) than snowmobile trails (CSA: 542.3 cm²; depth: 6.7 cm) (Table 2). Snow cover generally limits the disturbance of soils by snowmobiles (Liddle1997), but snowmobiles can cause soil disturbance and erosion when weather conditions, topography, or steep slopes reduce snow cover (Stangl,1999). In our study, 74 percent of motorized trail data points were located on seasonal, current, and historic roads and rights-of-way. Past use had likely altered soil properties at many of these locations and we could not determine the contribution of recreational use or nonrecreational uses to the physical dimensions of the trails.

Non-motorized trails had significantly greater CSA (427.0 cm²) than non-mechanized trails (164.2 cm²), but maximum tread depth for non-motorized (4.5 cm) and non-mechanized (4.0 cm) trails were not significantly different (Table 1). The greater CSA of non-motorized trails may result from greater tread width, rather than from soil compaction and erosion caused by mountain bikes. Non-mechanized trails had an average CSA similar to hiking trails in Acadia National Park (range: 31.3-223 cm² [Manning et al. 2006]).

Few studies have rigorously examined physical characteristics of motorized or mountain bike trails in New England, making comparisons to other studies difficult. However, a study in Kentucky and Tennessee found mountain bike trails had an average CSA 11 times

Table 3.—Percentage of sample points on motorized, non-motorized, and non-mechanized trails with: a gravel surface; a historic, seasonal, or current roadway; or trails specifically designed for recreational purposes

	Gravel Surface (%)		Historic, Seasonal, or Current Roads (%)		Specific Recreation Trails (%)	
	Mean	SE	Mean	SE	Mean	SE
Motorized	49	(5)	74	(34)	26	(5)
Non-motorized	17	(7)	29	(19)	68	(10)
Non-mechanized	4	(1)	8	(37)	91	(3)

Table 4.—Average frequency of excessively muddy areas; highly rutted and eroded trail sections; and occurrence of litter on motorized, non-motorized, and non-mechanized recreation trails

	Excessively Muddy (freq/km)		Rutted/Eroded (freq/km)		Trash (freq/km)	
	Mean	SE	Mean	SE	Mean	SE
Motorized	4.1 ^{a,b}	(0.4)	1.6 ^a	(0.2)	5.54 ^a	(0.68)
Non-motorized	2.9 ^b	(0.7)	1.0 ^{a,b}	(0.4)	2.58 ^b	(0.62)
Non-mechanized	6.6 ^a	(1.5)	0.8 ^b	(0.3)	1.13 ^b	(0.42)

^{a,b} Different letters represent significant differences among groups.

smaller than the non-motorized trails in this study but the CSA of ATV trails was twice as great (Olive and Marion 2009).

3.3 Excessively Muddy and Rutted/Eroded Trail Segments

Non-mechanized trails had the most sections with excessively muddy soils (6.6 sections/km, Table 4); this figure was significantly greater than motorized (4.1 sections/km) and non-motorized (2.9 sections/km) trails. The high frequency of muddy sections on non-mechanized trails can be attributed to the low percentage of gravel surfaces (4 percent of sampling points, Table 3) and the high percentage of trails (92 percent of sampling points, Table 3) used exclusively for recreation (not forestry, fire protection, or transportation). The geographic location and maintenance of non-mechanized trails may also account for the high density of muddy trail sections. Non-mechanized trails are often in remote areas that make maintenance practices, such as grading or hardening, impractical and expensive.

Excessively muddy areas are of concern to trail managers because they result in soil disturbance and compaction

and are vulnerable to rutting and trail widening (Reisinger and Aust 1990, Marion 1994). Muddy sections on motorized trails can degrade quickly from the weight of recreational machines, particularly ATVs. On motorized trails, 48 percent of sample points were on a gravel surface and 73 percent were on historic, seasonal, or current roads (Table 3). We believe the low frequency of muddy sections on motorized trails was due to hardening of the trail surface (application of gravel), location of trails on existing roadbeds with previously compacted soils, and routine maintenance by mechanical equipment to prevent degradation and unsafe conditions.

Areas with severe erosion and/or rutting are of serious concern to managers. They indicate areas with high levels of soil disturbance or loss (Roggenbuck et al. 1993, Vaske et al. 1993), which create safety hazards (Leung and Marion 1996, Marion and Leung 2001) and often require costly management actions or trail improvements (Olive and Marion 2009). Motorized trails (1.6 sections/km, Table 4) had a significantly greater frequency of rutted and eroded segments than non-mechanized trails (0.8 sections/km). This difference occurred even though non-mechanized trails had the highest frequency of

Table 5.—The percentage of stream crossing structures with different volumes of sediment input by trail type

Crossing Type	Sediment Volume	Motorized (%)	Non-Motorized (%)	Non-Mechanized (%)
All Crossing Structures	None	44	64	29
	Trace	25	24	33
	Moderate	18	8	32
	Catastrophic	13	4	6
Bridges	None	18	44	18
	Trace	10	8	8
	Moderate	3	4	7
	Catastrophic	3	0	1
Culverts	None	22	20	0
	Trace	13	12	0
	Moderate	9	4	0
	Catastrophic	7	0	0
Fords	None	4	0	13
	Trace	2	4	22
	Moderate	6	0	26
	Catastrophic	4	4	5

excessively muddy trail segments, which are vulnerable to rutting and erosion. Motorized trails, particularly ATV trails, are associated with ruts and erosion due to the mass of the vehicles (Liddle 1997) and large sheer forces of the tires on the soil (Meyer 2002). However, we found snowmobile and ATV trails to have no significant differences in the frequency of eroded/rutted trail segments (Table 2). This finding could be the result of the high proportion of motorized trails on historic, seasonal, or existing roads (74 percent) or a similar maintenance regime (grading, adding gravel). Other studies have found a much greater frequency of rutted/eroded sections on ATV trails (6.94 sections/km [Marion and Olive 2006]), but similar frequencies on mountain bike trails (0.7 sections/km [Marion and Olive 2006]) and hiking trails (1.31 sections/km, [Marion and Olive 2006]; 0.9-1.8 sections/km[Manning et al. 2006]).

3.4 Presence of Trash

Motorized trails in our study had a significantly greater frequency of trash visible from the trail than did other trail types, 5.5 pieces/km compared to 2.6 pieces/km on non-motorized and 1.1 pieces/km on non-mechanized trails (Table 4). Past research has found that recreation users view trash as highly undesirable in natural areas

(Roggenbuck et al. 1993, Shafer and Hammit 1995, Floyd et al. 1997). The authors of these earlier studies attribute the low frequency of trash on non-mechanized trails to the success of the leave-no-trace program. The leave-no-trace principles, including “carry-in, carry-out,” have been heavily promoted since the 1980s (Turner 2002). The high frequency of trash on motorized trails indicates an opportunity for trail managers to promote “carry-in, carry-out” with motorized user groups and to investigate why littering is so prevalent on motorized trails (maybe because of lack of trash facilities at parking areas, user behavior, or social norms).

3.5 Stream Crossings

Sediment inputs to streams degrade aquatic habitat (Allan 1995) and visitors to natural areas have a low tolerance for erosion near stream banks (Noe et al. 1997). However, we found that only 38 percent of all crossings had no sediment inputs and sediment inputs occurred on all trail types (motorized, non-motorized, and non-mechanized). Moderate sediment inputs occurred at 18 percent of motorized crossings, 8 percent of non-motorized crossings, and 32 percent of non-mechanized stream crossings (Table 5). The most severe category of sediment inputs, catastrophic, occurred on 13 percent of

motorized trails, 4 percent of non-motorized trails, and 6 percent of non-mechanized trails (Table 5).

Installation of bridges and culverts on trails is recommended to minimize degradation of water quality (Hammitt and Cole 1998). On motorized trails, 85 percent of stream crossings in our study had bridges or culverts (Table 5), but 53 percent of crossings with bridges or culverts still had sediment input to stream channels. On non-motorized trails, 30 percent of bridges and culverts had sediment additions, as did 48 percent of improved crossings on non-mechanized trails. Proper planning, installation, and maintenance of crossing structures are critical to minimizing sediment inputs and protecting water quality (Maine Forest Service 2004). A study of unpaved forest roads found that crossing structures installed without proper best management practices resulted in sediment input to the streams 44 percent of the time (Maine Forest Service 2006).

4.0 CONCLUSIONS

All trail types (motorized, non-motorized, and non-mechanized) contribute sediment to streams and degrade stream quality. The prevalence of sediment inputs from trails to streams should be a concern for recreation managers because of the direct implications for water quality and aquatic biodiversity (Allan 1995). Despite the ecological and societal importance of maintaining clean water (Postel and Carpenter 1997), we could find few other studies examining sediment inputs from trails to water bodies (Rinella and Bogon 2003). Evaluating stream crossings during trail assessments, as well as establishing guidelines and best management practices for installation, maintenance, and repair of crossing structures, would help ensure that recreation trails are not degrading water quality.

Overall, we found that motorized trails had greater soil disturbance and more frequent ruts and erosion than did non-motorized and non-mechanized trails. Most motorized trails are located on roadbeds with a recent history of human impacts and are heavily managed (e.g., gravel additions and routine grading). The location and management regime of motorized trails may be both ecologically and socially appropriate. However, this study

reports on trail conditions and compares conditions across trail types but cannot make value judgments regarding the acceptability of these types of impacts (Stankey 1979, Stankey and Manning 1986). As the motorized trail network expands, recreation managers and other stakeholders need discuss the amount and types of impacts that are acceptable for motorized trails. Establishing limits of acceptable change (Stankey et al. 1985, Cole and McCool 1997) will help ensure that trails are managed and designed to reduce environmental impacts and conflicts among user groups.

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OUTDOOR RECREATION III

EXPERIENCES OF CAMPERS AND CAMPSITE IMPACTS IN THE ST. REGIS CANOE AREA WILDERNESS

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Abstract.—Visitors who camped during the summer of 2007 in the St. Regis Canoe Area (SRCA) in the Adirondack Park, New York, were surveyed via an on-site interview and diary about 14 detracting situations or problems they may have experienced, how they coped with these situations, and how they rated satisfaction with various attributes of the trip. Campsite condition assessments were also conducted at 56 SRCA campsites. Data for camper experiences on a specific site were matched with the campsite assessment for that site to create a single data set with trip information related to a specific campsite. Three research propositions were explored and supported by the analysis: visitors perceive problems with both social and resource conditions; visitor satisfactions were affected by social conditions and resource conditions; and campers used coping mechanisms to deal with problems and intended to modify future behavior in response to on-site conditions.

1.0 INTRODUCTION

The Adirondack Park State Land Master Plan (APSLMP) requires the New York State Department of Environmental Conservation (NYSDEC) to develop management plans for each unit of the park. The management plans must have information on visitor use, including “an assessment of the impact of actual and projected public use on the resources, ecosystems, and public enjoyment of the area with particular attention

to portions threatened by overuse” (New York State Department of Environmental Conservation 2001, p. 10). The study area for this research is the St. Regis Canoe Area (SRCA), an 18,400-acre management unit in the northern-central region of Adirondack Park that is managed as wilderness under the APSLMP. The SRCA includes 58 water bodies (1,452 acres), 75 primitive campsites, three lean-tos, and 19 miles of portage and hiking trails. The SRCA is a popular destination for canoeing, kayaking, camping, fishing, hiking, and cross-country skiing.

Under the APSLMP, primitive campsites within the SRCA are required to be more than 100 feet from the shoreline, screened from the water by vegetation, and located 0.25 miles apart to be out of sight and sound from each other. They are also required to have campsite space for no more than three tents and eight people and a pit privy located more than 150 feet from the shoreline. Non-conforming uses include visitor-created campsite improvements, expansion of the campsite, and the addition of satellite campsites (user-created sites that adjoin the designated campsite). Some of the unit management plan objectives for the SRCA that pertain to this study include: “allow for camping opportunities in a variety of settings in the SRCA while protecting the natural resources; increase the amount of vegetation screening between campsites; limit the disturbed area associated with each campsite to what is required to accommodate no more than three tents and eight people”; and develop a campsite management plan for restoration and rehabilitation (New York State Department of Environmental Conservation 2006, p. 89).

A limited amount of information is available regarding visitor use and impacts in the SRCA that addresses the assessments required by the APSLMP (Fuller and Dawson 1999, Dawson et al. 2000, Pfaffenbach et al. 2003). Recent research by the authors (Dawson et al. 2008, Propst et al. 2009) began to address impacts of actual public use on the public enjoyment and on the resources of the SRCA. Visitor satisfaction is a

measurable outcome from a recreation experience process that includes encountering problems, coping, and experiencing satisfactions or dissatisfactions. Satisfaction has been used as a surrogate for evaluating recreation experience quality, and some research has shown that satisfaction measures may be appropriate indicators of short-term outcomes (Manning 1999).

The research herein integrated field data on visitor experiences and physical conditions of the campsites in the SRCA. The following analysis was based on three propositions about visitor perceptions of impacts to the campsites and social conditions: (a) visitors perceive problems with both social and resource conditions; (b) visitor satisfactions are affected by social conditions and resource conditions; and (c) campers use coping mechanisms and intend to modify future behavior in response to on-site conditions.

2.0 METHODS

Data were collected in the SRCA between mid-June and early September 2007. The overall study consisted of field interviews and diaries of campers in the SRCA, and objective measures of campsite conditions within the SRCA.

2.1 Camper Study

Convenience sampling was used to contact visitors at five water access points around the SRCA. Paddlers staying at least one night in the SRCA were asked to participate in the daily diary portion of the study. Paddlers carried the diary with them and filled it out each night at their campsite, then returned it in a stamped, addressed envelope to the researchers. Participants were given a free waterproof map-case as an incentive to participate. The diary was designed to collect information related to problems (hassles), coping, satisfaction, and trip characteristics. Other research (Schuster et al. 2003, 2006) has used the scale employed in this study to assess 14 problems (e.g., difficulty finding open campsite, behavior of other campers, human impacts to physical campsite conditions). The diary also included measures of satisfaction that parallel similar studies (Pfaffenbach et al. 2003) and measures of camper intentions to return to that campsite and management area.

2.2 Campsite Study

The procedure was to sample the most often used sites on the main travel and portage routes within the SRCA and complete the measurements and assessments for as many of the sites as time and weather would allow between mid-June and early September. Objective measures of campsite conditions within the SRCA were taken using 19 variables (e.g., soil exposure, vegetative ground cover, tree damage, litter) and a rapid assessment of the overall condition class of the campsite. Standard measurement and assessment procedures were used as reported by Cole (1989) and Frissell (1978). A research technician trained in reliable and repeatable campsite assessment techniques collected the assessment data.

Computer-assisted analysis was conducted using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL). Data analysis included descriptive statistics, chi-square bi-variate analysis, and multi-variate discriminant analysis.

3.0 RESULTS AND DISCUSSION

The following results represent only a small portion of the overall information collected in these studies (Dawson et al. 2008). These results are from the camper study, the campsite assessment study, and some combined results across the two studies.

3.1 Camper Study

The interviewer approached 488 paddlers, six of whom refused contact, for an on-site response rate of 98.7 percent. Of the 482 paddlers who agreed to participate, 189 paddlers (39.2 percent) indicated that they would be staying overnight in the SRCA. All except two paddlers agreed to participate in the daily diary. We distributed 187 daily diaries; 104 were returned and usable, for a response rate of 56 percent.

Paddlers were asked to indicate their level of satisfaction with eight different characteristics of the daily SRCA experience and their overall trip satisfaction. Of the five characteristics of the daily SRCA experience that are relevant to this manuscript (see Figure 1), all five were viewed as either satisfactory or very satisfactory by a

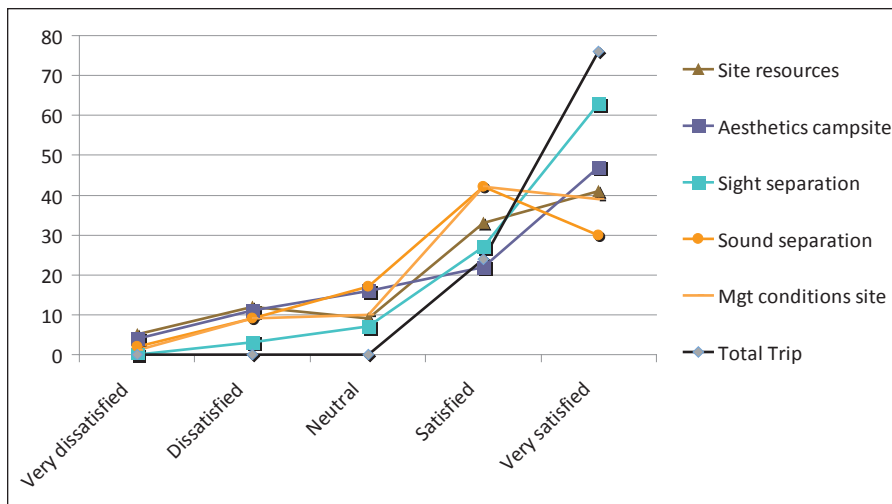


Figure 1.—Percent of SRCA campers reporting satisfaction with five characteristics of their campsite and their total trip satisfaction.

Table 1.—Rapid assessment ratings for 56 campsites in the St. Regis Canoe Area in the summer of 2007

Condition class description (Frissell 1978)	Condition class	Number of campsites
Ground vegetation flattened but not permanently injured. Minimal physical change except for possibly a simple rock fireplace.	1	0
Ground worn away around fireplace or center of activity.	2	6
Ground vegetation lost on most of the site, but humus and litter still present in all but a few areas.	3	19
Bare mineral soil widespread. Tree roots exposed on the surface.	4	12
Ground vegetation lost on most of the site, but humus and litter still present in all but a few areas.	5	19

majority of the respondents. Overall, 77.1 percent of the boaters who camped were very satisfied and 22.9 percent were satisfied with their total camping trip experience. Ninety-three percent of respondents reported one or more management or resource-related problems at a slight to more serious level of severity and 55 percent of respondents reported one or more social-related problems at a slight to more serious level (5-point scale). Refer to Propst et al. (2009) for a detailed report of social condition data.

3.2 Campsite Study

The campsite assessment investigated 56 of the 75 designated sites within the SRCA along the most heavily traveled routes through the SRCA waterways. Campsite locations and numbers were recorded in a manner that allowed the camper diary information to be linked to the data for the field study of the campsite conditions.

The majority (89 percent) of the assessed campsites were highly impacted with a Frissell (1978) overall condition class rating of class 3 and above (Table 1). Over time campers had expanded the average campsite to 2,300 square feet and these 56 sites ranged from 400 to 12,800 square feet in size. Campers had also created 46 satellite sites adjoining these 56 designated sites with an average size of 400 square feet and a range of 100 to 1,700 square feet in size. Overall, the level of impact from these and other variables indicated that most of these sites probably do not meet the APSLMP condition requirements for a primitive site.

3.3 Combined Camper and Campsite Study Data

The multi-variate discriminant analysis models predicted daily satisfaction ratings based on related camper perceptions of social and resource problems

Table 2.—The number of campers who reported satisfaction with campsite aesthetics versus reported problems with the physical condition of the campsite due to human impacts (n=93)

Satisfaction Rating	No problem	Slight problem		Moderate problem		Serious problem
Very dissatisfied	0	0	0	1	1	2
Dissatisfied	0	1	4	3	1	1
Neutral	5	4	5	1	0	0
Satisfied	3	7	5	4	0	1
Very satisfied	31	10	2	1	0	0

Table 3.—The number of campers in each overall campsite condition class that reported a problem with the physical conditions of that campsite (n=93)

Campsite Condition Class	No problem	Slight problem		Moderate problem		Serious problem
Class 2	2	0	1	0	0	0
Class 3	9	1	0	0	0	0
Class 4	13	10	2	2	2	0
Class 5	15	11	13	9	1	4

(14 variables), actual measured resource conditions (19 variables), and coping use (55 percent or more of cases were correctly classified). However, since all campers were either satisfied or very satisfied with their total trip experience (Figure 1), this model was not considered to be very insightful or parsimonious. The most discriminating variables were the camper perceptions of physical campsite impacts and social condition; least discriminating were variables of objective measures of resource conditions. This observation led to a bi-variate analysis, where possible, between camper perceptions of physical and social conditions and satisfactions and between camper perceptions and objective measures of campsite impacts.

The camper-reported satisfaction ratings with campsite aesthetics were significantly associated with their reported problems with the physical conditions of the campsite (Table 2; chi-square = 77.7; $p < 0.05$). While the trend in Table 2 is along the diagonal from no reported problems and very satisfied campers (lower left) to a serious problem and very dissatisfied campers related to aesthetics (upper right), there are numerous cases that do not follow the expected trend. Possible explanations are that some campers did not perceive the human impacts at

campsites or they did not find that the impacts detracted from campsite aesthetics.

An example of the observation that some campers did not perceive the human impacts is seen by comparing the objective campsite condition class with the campers' reported problem rating for human impacts to the campsite (Table 3). While the trend in Table 3 is significant (chi-square = 25.7; $p < 0.05$) along the diagonal from no reported problems and class 2 campsite conditions (upper left) to a serious problem and class 2 campsite conditions (lower right), the majority of the cases do not follow the expected trend. Sixty percent of the respondents who stayed in heavily physically impacted sites (condition classes 4 and 5) reported having no problems or only slight problems with the physical condition of the campsite.

An example of the observation that some campers do not consider physical conditions at the campsite as detracting from the campsite aesthetics is seen by comparing the actual campsite distance from shore with the campers' reported problem rating for the campsite distance to the shore (Table 4). There is no significant trend (chi-square = 6.2; $p > 0.05$) in Table 4 because the vast majority of the

Table 4.—The number of campers in each campsite distance to shoreline category versus reported problems with campsite distance to shoreline (n=93)

Campsite distance to shoreline	No problem	Slight problem	Moderate problem	Serious problem
25 ft. or less	33	3	0	0
26 to 50 ft.	34	0	0	0
51 to 75 ft.	13	0	0	0
76 to 100 ft.	8	0	0	0

Table 5.—Future behavioral intentions of campers in the SRCA by the number of cases (n=93)

As a result of my St. Regis Canoe Area camping experience on this trip I am likely to . . .	Very unlikely	Unlikely	Neutral	Likely	Very likely	Total
Return to the St. Regis Canoe Area and...						
...use the same campsite	3	9	21	31	36	100
...avoid this campsite and seek another one	30	23	32	11	4	100
...avoid certain times of the day	32	25	32	10	1	100
...avoid certain times of the week	19	20	26	23	12	100
...avoid certain times of the year	18	19	35	19	9	100
...avoid certain ponds/travel routes	24	32	32	10	2	100
Return to the St. Regis Canoe Area on a day trip...						
...but not camping again	38	29	22	4	7	100
Not return to the St. Regis Canoe Area and...						
...will go to a different wilderness area within the Adirondack Park	41	11	26	12	10	100
...will go to a different wilderness area outside the Adirondack Park	47	5	29	7	12	100

campers (95 percent) did not perceive the distance to the shore as a problem regardless of the actual distance. The APSLMP requires primitive campsites to be more than 100 feet from the shoreline; none of the SRCA campsites met that distance requirement but campers did not generally consider it a problem.

In addition to questions about trip satisfaction, one way to understand how social and biophysical settings in the SRCA affected camper experiences was to ask about how they dealt with problems. Propst et al. (2009) reported that 63 percent of campers used one or more of the following three types of coping during their trip in the SRCA: rationalization, acceptance-avoidance coping, and confrontational coping. Another way to understand how camper experiences were affected was to ask campers about their intention to return to the SRCA

in future trips (Table 5). Sixty-seven percent of campers reported they would return to the SRCA and use the same campsite. However, when presented with five types of situations to avoid (see Table 5), campers frequently reported that they would return to the SRCA but would be either likely or very likely to employ one or more spatial or temporal displacement behaviors: avoid certain times of the week (35 percent), avoid certain times of the year (28 percent), avoid current campsite (15 percent), avoid certain ponds and travel routes (12 percent), and avoid certain times of the day (11 percent). Additionally, 11 percent of campers reported that they would be likely or very likely to return only as day users to the SRCA and another 22 percent of campers would go instead to another Adirondack wilderness area (22 percent) or to a wilderness outside the Adirondack Park (19 percent).

4.0 CONCLUSIONS

Data illustrated in Figure 1 show that visitors perceived problems with both social and resource conditions. Discriminant analysis found significant correlations between visitor satisfactions and both social conditions and resource conditions, as well as bi-variate measures of association between these variable types (for an example, see Table 2). Results reported herein and in Propst et al. (2009) confirm that campers did use coping mechanisms and intended to modify future behavior in response to on-site conditions in the SRCA. The original propositions, however, did not predict the low measures of association (chi-square statistics and Tables 3 and 4) that were found between camper perceptions of problems with physical conditions and objective measures of physical conditions.

Campers did report experiencing detracting situations, especially related to campsite conditions and visitor interactions, and exhibited coping behaviors in response to these problems. Even though a large percentage of the designated primitive campsites in the SRCA were in unacceptable condition classes (compared to the SRCA UMP and the APSLMP), campers generally did not report them to be a problem or perceived their condition as a less serious problem when compared to the campsite assessments objectively measured in the field. Camper satisfactions remained high through various coping mechanisms.

Managers need to consider that more than half (63 percent) of the paddlers who camped were utilizing at least one coping strategy. As we note here and as Propst et al. (2008) reported, if most people need to employ coping mechanisms to have a high-quality visitor experience, then managers may need to address the problems that provoke these coping behaviors. Furthermore, managers need to understand the use of coping schemes in order to further assess the influence of public use and past visitor impacts on visitor experiences.

While coping activities appeared to be effective in mediating stressful situations during the trips in this study (i.e., all campers reported satisfying trip experiences), they may not continue to be effective when

the campers make future decisions regarding travel to the SRCA. Most campers in the study intended to return to SRCA, but large percentages of campers also intended to change their behaviors related to visiting the SRCA. This response is another indication that campers perceived the cumulative conditions in the SRCA and were displacing them temporally and spatially as a longer-term coping strategy.

Campers do not perceive the resource conditions as problems to the same degree as reported by the field measurements, but they did perceive and were reacting to the problems they experienced while on their trip in the SRCA. These data support the NYSDEC's plans to improve campsite conditions and camper experiences by reducing the campsite impact area, providing more vegetative screening, and developing a campsite management plan for restoration and rehabilitation (New York State Department of Environmental Conservation 2006).

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A COMPARATIVE ANALYSIS OF MAIL AND INTERNET SURVEYS

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Abstract.—The field of survey research is constantly evolving with the introduction of new technologies. Each new mini-revolution brings criticism about the accuracy of the new survey method. The latest development in the survey research field has been increased reliance on Internet surveys. This paper compares data collected through a mixed-mode (mail and Internet) survey of Zuma Beach users in Malibu, CA, focusing on differences in response rate and in responses to questions between the two modes. Two-sample *t*-tests were performed on each variable to determine differences between the modes. These tests found 15 significant differences in responses to demographic variables, scale items, and Likert items. The format of questions is discussed as a possible explanation for some of these differences in responses.

1.0 INTRODUCTION

The widespread availability of the Internet and the rapid pace at which online technologies develop has led to a rise in Internet-based social research, mainly in the form of electronic surveys. Ease of use, low cost, and advanced capabilities make Internet surveys an attractive medium to many researchers. Internet surveys also have some potential limitations. Two of the most often criticized (and studied) aspects of Internet surveys are lower response rates than mail surveys, which could indicate a nonresponse bias (Manfreda et al. 2002), and real or potential differences between data collected online and data from mail-based surveys.

To examine these two possible limitations, a mixed-mode survey method was used during a recent research project at Zuma Beach in Malibu, CA. The primary goal of this project was to pilot-test questions about social benefits

of coastal restoration. In addition, the response rates and likeness of data collected between mail and Internet versions of the survey were analyzed.

2.0 METHODS

Data were collected through a survey sent to individuals who used Zuma Beach during summer 2008. The researchers followed a sampling schedule which randomized the time of day, day of the week, and area of the beach from which they drew their sample. Potential participants were first asked to participate in a research project about beach use. If they agreed to participate, they were asked to provide their name as well as either a mailing address or an email address; those who provided both were randomly assigned to one of the groups.

During field-sampling, 1,416 people provided useable contact information. Two-thirds of the sample (949 individuals) subsequently received the mail version of the questionnaire and the remaining one-third (467 individuals) received the Internet version.

The mail version of the questionnaire was distributed using the Dillman Total Design Method (Dillman 1978). The Internet version of the survey was distributed using a similar design (Dillman 2000). Individuals in the Internet group received four email contacts from the researchers, consistent with the traditional Dillman Total Design Method. However, the day of the week on which a participant received the email notifications was varied to account for individuals who check their email at different frequencies.

3.0 RESULTS

3.1 Modal Response Rates

The research sought to determine whether response rates between the two modes were different. Prior research in this field has implied that mail-based surveys have higher response rates than their online counterparts (Smee and Brennan 2000, Fricker and Schonlau 2002, Kaplowitz et al. 2004). The response rates in this research are 50

Table 1.—Modal response rates

	Initial Sample	Non-Deliverable	Effective Sample	Completed Surveys	Response Rate
Mail version	949	66	883	441	50%
Internet version	467	71	396	173	44%

Table 2.—Demographic profile of the average respondent, by mode

	Mail Respondents	Internet Respondents
Gender	Female	Female
Age	41* years	45* years
Racial category	White	White
Annual income	\$75,000 - \$99,000*	\$100,000 - \$124,999*
Level of education	Bachelor's degree	Bachelor's degree
Children living at home	Yes	Yes

*Significantly different at the $\alpha = 0.10$ level.

percent for the mail version and 44 percent for the Internet version (Table 1). It is important to note that these two rates are not statistically different ($p=0.21$).

3.2 Differences in Responses

The analysis also examined differences between the actual responses that participants provided. Differences between mail and Internet groups were tested using a two-sample *t*-test performed on all 144 variables. Using an α -level of 0.10, we expected to observe 14 significant differences between responses. An α -level of 0.10 is used instead of the conventional 0.05 because it is a more powerful statistical test, though less rigorous (Trochim 2000, Gigerenzer 2004). In this type of social research, this α -level is sufficient for drawing statistically significant conclusions.

Fifteen significant differences occurred between the sets of data in demographic profile information and responses to scale and Likert items.

3.2.1 Respondent demographic differences

The two groups of respondents were virtually identical in demographics (Table 2). Cole (2005) suggests that mail survey respondents are likely to be older than online survey respondents. In this research project, however, online survey respondents were significantly older (mean age = 45 years) than mail survey respondents (mean age = 41 years). The two respondent groups differ significantly in income level; Internet survey respondents have a

higher average income than mail survey respondents. This income difference may reflect different levels of Internet access and/or proficiency between the two groups.

3.2.2 Response differences on scale items

Three of the 15 significant differences in the data were in questionnaire items, where the participant was asked to assess the level of a variable (e.g., familiarity, crowding) on a 9-point scale. In the mail version, participants were instructed to circle a number on a number line to identify their level of a variable (Fig. 1A). The Internet version required that respondents click an un-numbered radio button to indicate their level of a variable (Fig. 1B).

Online survey respondents consistently rated variables lower on these Discrete Visual Analog Scale (DVAS) items than did mail respondents. DVASs may be more ambiguous than their Likert-type cousins because they lack labels for each point on the scale (Uebersax 2006). The presence of a number in the paper version may have helped respondents “anchor” their response to the question by associating their level of a variable with an actual number. Because there was no numerical label for each radio button, Internet participants could rely only on the verbal descriptions at the poles of the scale as a basis for their ratings. In essence, online survey respondents lacked the advantage of having each possible rating “explained” by a numerical label as the mail respondents did.

A **25. On the scale below, please indicate how familiar you are with the restored Zuma Creek area at Zuma Beach. (Please circle one response)**

1	2	3	4	5	6	7	8	9
Not at all familiar								Extremely familiar

B **25. On the scale below, please indicate how familiar you are with the restored Zuma Creek area at Zuma Beach.**

	Not at all familiar							Extremely familiar
Familiarity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 1.—(A) 9-point scale item from the mail questionnaire. (B) 9-point scale item from the Internet questionnaire.

This potential Format-Associated Response Effect needs further examination. If, in fact, participants do use the numerical descriptions to anchor their responses on the scale, researchers using online survey software need to be aware of this issue.

3.2.3 Response differences on Likert-scale items

The remaining 10 significant differences observed between the two modes were on Likert-scale items. These differences did not have the same pattern as the differences on scale items and were seemingly random throughout the questionnaire. Further, we might have expected to observe differences on Likert-scale items as opposed to multiple-choice or open-ended items, simply because there are more Likert-scale items on the questionnaire.

4.0 DISCUSSION AND IMPLICATIONS

As technology develops and Internet use spreads, online surveys will likely begin to replace mail surveys. However, some researchers are uncertain about whether Internet surveys will produce the same result as mail surveys. This research found that the information is almost the same between the two modes; the major differences between the two modes were on scale items. Since response rates between the two modes were statistically the same, people seemed equally comfortable filling out online and hard-copy surveys. More research is needed on the potential effects of question-and-answer formatting on Internet versus pencil-and-paper surveys.

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A COMPARISON OF TWO FOLLOW-UP ANALYSES AFTER MULTIPLE ANALYSIS OF VARIANCE, ANALYSIS OF VARIANCE, AND DESCRIPTIVE DISCRIMINANT ANALYSIS: A CASE STUDY OF THE PROGRAM EFFECTS ON EDUCATION-ABROAD PROGRAMS

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Abstract.—This study compared the utility of two different post-hoc tests after detecting significant differences within factors on multiple dependent variables using multivariate analysis of variance (MANOVA). We compared the univariate F test (the Scheffé method) to descriptive discriminant analysis (DDA) using an educational-tour survey of university study-abroad students. Differences on five dependent measures of study-abroad program outcomes were compared by students' academic major and in-country residency arrangements (residence hall, home stay, apartment). Univariate F test and DDA were used to detect group differences in the dependent variables after the overall significant F test in MANOVA. The results indicated that the two post-hoc tests were congruent. However, DDA served better than the univariate F test to determine which outcome variables contributed most to separating the independent variables. We conclude that both post-hoc analyses should be utilized after a significant MANOVA to obtain accurate and full insight into the data.

1.0 INTRODUCTION

Multiple analysis of variance (MANOVA) is a statistical test that captures the effects of multiple independent variables on more than one dependent variable (Bray and Maxwell 1985). An important question in multivariate research is how best to examine and identify significant differences, if any, of varying values of multiple independent variables on multiple dependent variables. The univariate F test and descriptive discriminant analysis (DDA) are two major post-hoc approaches utilized to identify the differences between groups (Tabachnick and Fidell 2007). In reviewing the

literature, Kieffer et al. (2001) found that more than 80 percent of reviewed studies utilizing MANOVA also employed univariate F tests, such as the Scheffé and Tukey tests, as post-hoc analyses. This common approach to post-hoc analysis fails to consider the shared variance between dependent variables, as a series of univariate F tests examines group differences only individually on each dependent variable. In light of this discrepancy in the research literature, our primary concern is the effectiveness of post-hoc analysis for examining group differences following a significant MANOVA.

DDA, a multivariate post-hoc procedure, may serve as an alternative approach to identify group differences because it takes all dependent variables into account and follows MANOVA ethos. As Huberty and Smith (1982) suggest, researchers might need to “think multivariately” (p. 429) as they conduct multivariate studies. Specifically, DDA identifies which variables contribute the most to separating predictor groups with one procedure, instead of individually evaluating a predictor group's unique effect on each of the dependent variables. The purpose of this study was to compare the utility of the univariate F test with DDA using data from a survey of study-abroad students on an educational tour. Comparisons of the two post-hoc procedures were made after significant results were found using MANOVA.

2.0 METHODS

We used data from a survey of students in a study-abroad program to observe the differences between two post-hoc analyses after MANOVA. Specifically, we attempted to identify the relationships of independent predictors to the combined program effects as evidenced by examining the relationships with multiple dependent variables. In summer 2005, the Web-based survey collected data on participants' perceptions of program effects on educational tours. The advantages of this survey program included lower publication costs (Nahm et al. 2004), convenient access (Schutt 2001), and an autonomous database system.

Table 1.—Characteristics of participants in effect-modeling study

Demographic Characteristics	Frequency	Percentage
Majors, N=263		
Art	28	11
Business	68	26
Liberal Arts	108	41
Science	59	22
Residency options, N=265		
Residency hall	104	39
Home stay	60	23
Apartment	101	38

In this example, 25 program effect items were generated from an intensive literature review and entered into an exploratory factor analysis. The five factors extracted from this analysis served as dependent variables in MANOVA and subsequent post-hoc tests. MANOVA was used to test for significant mean differences across the five program-effect variables for individuals who varied in terms of two independent predictors: academic majors and residency arrangements. MANOVA is used to control the possibilities of Type I error inflation as it examines the effects of independent variables on the dependent variables simultaneously instead of examining each dependent variable separately (Tabachnick and Fidell 2007).

When significant overall *F*-test values were identified in each MANOVA, we compared the two post-hoc procedures, Scheffé method for univariate *F* (see Hair et al. 2006) and DDA, to contrast their different approaches in determining the effects of group differences on the dependent variables. Unless otherwise noted, the criterion for statistical significance was set at .05 for these analyses.

3.0 RESULTS

Participating in this online study were 265 students, a sample size that provides adequate statistical power (Mertler and Vannatta 2002). Participants' academic majors were categorized as art, business, liberal arts, and science. Residency options were sorted into three categories: apartment, home stay, and residence hall. Table 1 illustrates sample characteristics. Most participants were liberal arts or business majors. The

home-stay option was not very common as most students lived in apartments and residence halls during their stay abroad.

A value of more than .60 levels in the Kaiser-Meyer-Olkin measurement and a significant Bartlett's test of sphericity suggested that this dataset was suitable for exploratory factor analysis (Tabachnick and Fidell 2007). The analysis produced a five-factor solution that was evaluated on the basis of three criteria: Eigenvalues, loading values, and scree plot (Mertler and Vannatta 2002). Specifically, an item was deleted before the next statistical test if any of the following conditions were met: item with Eigenvalue lower than 1, factor loading value lower than .45 (with 20 percent overlapping variance (Comrey and Lee 1992), or being outside of the sharply descending line in a scree plot. As for cutoff levels for loading values, Comrey and Lee (1992) suggest that 0.40 levels with about 25 percent overlapping variance are appropriate criteria for discriminating factor loadings. In this study, two items (i.e., "I discovered that local people have opinions that differ from mine on some issues" and "I am more willing to interact with people with different cultural backgrounds than I was before my trip abroad") failed to meet the above criteria. These items were deleted before the next statistical test, MANOVA. About 51 percent of the total variance was explained in this analysis. The five factors served as scales measuring program outcomes for language learning, personal development, foreign connection, cultural immersion, and career development, which were each dependent variables for this study. Reliability analyses demonstrated that all scales met acceptable levels of reliability as Cronbach's alpha was 0.6 or higher for each, and this study represented exploratory research (Robinson et al. 1991). Table 2 lists the items associated with each scale and the corresponding factor loading values and Cronbach's alpha coefficients.

MANOVA was conducted to determine differences in students' majors with respect to the combined program outcomes. Because of its robustness, Pillai's Trace was utilized as the test statistic because the Box's *M* test showed that equal variances could not be assumed, $M = 66.262$, $F(45, 42863.66) = 1.406$, $p < .05$ (Mertler and Vannatta 2002). MANOVA results revealed

Table 2.—Factor loadings and Cronbach's alpha values of five program-effect model by exploratory factor analysis

Factor Names and Items	Loading	α
Factor 1, Language learning		
I think my destination language proficiency was improved after participating in the program.	.86	.84
I think this program gave me a better chance to practice the destination language than the classroom alone.	.85	
I really enjoyed learning the destination language in this program.	.80	
I could read some foreign newspaper without too much difficulty after I participated in the study-abroad program.	.57	
I could read some foreign newspaper without too much difficulty after I participated in the study abroad program.	.54	
Factor 2, Personal development		
I am more independent than I was before the program.	.67	.71
I feel more confident in myself after finishing the program.	.59	
I have different perceptions of what my life should be since my return from the other country.	.57	
I have a new outlook on the world since my study-abroad experience.	.56	
The program changed the perceptions about the local people at my study-abroad destination.	.34	
Factor 3, Foreign connection		
I felt that I was part of the local community during this trip.	.73	.72
I felt at home during this trip.	.60	
I feel I am still connected with local people even after the program was over.	.59	
I will visit this destination again if possible.	.52	
Factor 4, Cultural immersion		
Different cultural encounters enriched my study-abroad program.	.75	.64
The program gave me a chance to learn about a different culture.	.60	
The program helped me to increase my knowledge of the local culture at my study abroad destination.	.41	
To engage myself in a different cultural environment was one of my purposes for joining this program.	.40	
Factor 5, Career development		
I will consider employment in global companies because of my experience in the study- abroad program.	.68	.70
The program has raised my interest in some overseas job.	.63	
I have different views about my future career after my trip.	.50	
This program was important to me because it will someday be useful in getting a good job.	.58	
Deleted Items		
I discovered that local people have opinions that differ from mine on some issue.	.43	
I am more willing to interact with people with different cultural backgrounds than I was before my trip abroad.	.32	

Note: All items are measured on a 5-point scale of 1= Strongly disagree to 5 = Strongly agree.

significant program effect differences in the four majors, Pillai's Trace = 0.13, $F(15, 771) = 2.41$, $p < .05$, partial multivariate $\eta^2 = .05$.

In the next step, the Scheffé method with Bonferroni correction suggested that students' majors significantly differ in cultural immersion ($F(3, 263) = 6.43$, $p < .001$, partial $\eta^2 = .07$). In particular, it appears that art majors significantly differed from business and science majors

in the cultural immersion dimension. Business and science majors were more likely to endorse cultural immersion than were art majors (i.e., 4.73 and 4.73 vs. 4.38, respectively). DDA was also used as one of the post-hoc methods to identify which program effect factors would contribute most to separating the major groups (Art, Business, Liberal Arts, and Science). For that, the five dependent variables served as predictors to separate the major groups. DDA revealed that one out

Table 3.—Results of discriminant function analysis of the program effects by majors

Variables	Discriminant Function	
	Correlation Coefficients with Discriminant Function	Standardized Discriminant Function
Language learning	.17	-.01
Personal development	-.04	-.37
Foreign connection	.21	-.13
Cultural immersion	.94	1.06
Career development	.16	.17

Note: Wilks' Lambda $\Lambda = 0.87$, $\chi^2(5, N = 265) = 35.70$, $p < .05$

Table 4.—MANOVA of program-effect factors by majors

Program Effects	Overall Mean	Majors				F- value (df = 263)
		Art	Business	Liberal Arts	Science	
		-----Mean Agreement Score-----				
Language learning	3.80	3.64	3.99	3.82	3.63	2.58
Personal development	4.25	4.23	4.32	4.27	4.15	1.10
Foreign connection	3.94	3.83	4.04	3.91	3.92	0.70
Cultural immersion	4.65	4.38 _{a, b}	4.73 _a	4.64	4.73 _b	6.43***
Career development	3.85	3.78	4.06	3.81	3.72	2.75*

Note: Overall agreement score was measured on a 5-point scale of 1 = Strongly disagree to 5 = Strongly agree.

Means sharing the same subscript differ at $p < 0.01$ in the Scheffé comparison, two-tailed.

* $p < .05$; ** $p < .01$; *** $p < .001$

of three generated functions was significant [$\Lambda = 0.87$, $\chi^2(5, N = 265) = 35.70$, $p < .05$], indicating that the construct differentiating majors was primarily the cultural immersion scale. It had a canonical correlation coefficient of .94 (see Table 3). Results of the Scheffé's post-hoc method (see Table 4) with a Bonferroni adjustment (.01 significance levels) were congruent with findings from DDA; that is, art majors significantly differed from business and science majors in the cultural immersion dimension.

As for residency arrangement and program effects, MANOVA was conducted to determine the location differences, (i.e., including apartment, home stay, and residence hall), in the combined five program-outcome factors. Pillai's Trace statistic was used to evaluate the significant relationship between residency location and effects since equal variances could not be assumed in the Box's M test, Pillai's Trace = .31, $F(10, 518) = 9.30$, $p = .002$, partial multivariate $\eta^2 = 0.15$. Based on univariate F tests with Bonferroni adjustment (see Table 5),

residency location category differences were significant for language learning, $F(2, 262) = 42.57$, $p < .001$, partial $\eta^2 = 0.25$. The home-stay group had a significantly higher mean value than the residence hall group (4.51 vs. 3.46) and the apartment group (4.51 vs. 3.73) in terms of perceived language learning effects (Table 6). DDA also indicated that the language learning effect (with a canonical correlation coefficient of 0.92) served as the best variable to distinguish residency group across the three levels, apartment, home stay, and residence hall, $\Lambda = 0.70$, $\chi^2(5, N = 265) = 91.47$, $p < .05$.

4.0 DISCUSSION OF THEORETICAL IMPLICATIONS

Since the 1980s, the univariate F test has been widely employed as a standard procedure following a significant MANOVA test based on the suggestion of Cramer and Bock (1966). Further illustrating its wide usage as a post-hoc procedure, Keselman and colleagues (1998) reviewed 79 MANOVA studies from 1994 through 1995 and found only four studies that used DDA as a

Table 5.—Results of discriminant function analysis of the program effects by residence arrangements

Variables	Discriminant Function	
	Correlation Coefficients with Discriminant Function	Standardized Discriminant Function
Language learning	0.92	1.00
Personal development	-0.23	-0.25
Foreign connection	-0.12	-0.04
Cultural immersion	-0.03	-0.15
Career development	-0.08	-0.10

Note: Wilks' Lambda $\Lambda = .70$, $\chi^2(10, N = 265) = 91.47$, $p < .001$

Table 6.—MANOVA of program-effect factors by residence arrangements

Program Effects	Overall Mean	Residency Location			F- value (df = 263)
		Residence Hall	Home Stay	Apartment	
		-----Mean Agreement Score-----			
Language learning	3.80	3.46 _a	4.51 _{a,b}	3.73 _b	42.57***
Personal development	4.26	4.30	4.10	4.31	3.04*
Foreign connection	3.94	4.03	3.87	3.89	1.16
Cultural immersion	4.65	4.68	4.65	4.64	0.25
Career development	3.86	3.96	3.84	3.76	2.04

Note: Overall agreement score was measured on a 5-point scale of 1 = Strongly disagree to 5 = Strongly agree. Means sharing the same subscript differ at $p < 0.01$ in the Scheffé comparison, two-tailed.

* $p < .05$; ** $p < .01$; *** $p < .001$

follow-up test. This predominant use occurred despite a major concern about utilizing a univariate approach as post-hoc analyses for a multivariate procedure and despite fundamental flaws with this approach. Specifically, a univariate post-hoc procedure does not take the correlations between dependent variables into account. Considering these limitations, Field (2005) strongly recommends the use of DDA as it accounts for correlations between dependent variables and meets the ethos of MANOVA.

The results for this study indicated that the post-hoc tests from the univariate F test (Scheffé method) and DDA were congruent when we tested for significant differences between factors in MANOVA. In a similar study, Enders (2003) suggested that the choice of post-hoc analysis depends on the research question of interest: exploring group differences or identifying the contribution of variables to separating the predictor groups. Specifically,

the univariate test is recommended when researchers emphasize understanding the differences of group means on the dependent variables. Alternatively, a multivariate approach, such as DDA, could be employed to determine which group contributes most to the significant MANOVA results. DDA can also help understand which variable might capture group differences when all univariate F tests are not significant. In this exploratory study, we were not able to identify a priori which approach to utilize as the more appropriate post-hoc analysis procedure, and both approaches were employed and compared to determine how each identified group differences on the dependent measures. The comparisons in this study suggested that both types of post-hoc analyses, the univariate F test and DDA, were useful in providing a full understanding of the differences in the data, and offered a case where employing both methods is recommended.

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*RECREATION AND
TOURISM IMPACTS*

ECONOMIC IMPACT OF THE 2008 AMERICAN FOLK FESTIVAL IN BANGOR, MAINE

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Abstract.—Festivals and events are becoming increasingly important drivers of tourism activity in Maine. Based on a survey of festival visitors, this study used an IMPLAN™ input-output model to estimate the economic impact of the 2008 American Folk Festival in Bangor, ME. The Center for Tourism Research and Outreach estimated that 95,626 local and non-local individuals visited the festival. Visitors' spending outside of the festival was highest for restaurants and/or lounges, followed by gasoline, hotels, gifts, and outdoor equipment. For those who visited the festival exclusively, the highest expenditures were for hotels and other accommodations, followed by grocery and convenience store purchases, restaurants and/or lounges, and gasoline. Visitors' estimated total direct spending was \$6.5 million. The festival's estimated economic impact in the Bangor area was \$9.8 million. Implications for the local economy and suggested strategies for promoting the festival are discussed.

1.0 INTRODUCTION

Festivals and events are important drivers of tourism activity in a growing number of communities in Maine. The Portland Sidewalk Art Festival, American Folk Festival in Bangor, Yarmouth Clam Festival, and Rockland Lobster Festival are some of the better known events that take place every year.

The American Folk Festival on the Bangor waterfront has been a celebration of multi-cultural traditional arts and music for 7 years. Attendees enjoy music, dance, and

other performing arts representing cultural traditions from Maine, the nation, and the world. Festival-goers are offered the opportunity to purchase authentic, traditionally made crafts from Maine artisans. The festival experience is enhanced by a variety of regional, ethnic, and fair food.

The impact of the American Folk Festival on the area occurs through: 1) spurring economic activity; 2) expanding the cultural and artistic opportunities available to Bangor residents; and 3) increasing the visibility of Bangor as a tourist destination.

Working with festival organizers, the University of Maine's Center for Tourism Research and Outreach conducted a study of the 2008 American Folk Festival to gauge attendees' experience and estimate both the direct and indirect economic contribution of the festival to the regional economy.

2.0 LITERATURE REVIEW

Festival organizers may focus on the social and cultural benefits that festivals bring to local communities by preserving traditions and contributing to community cohesiveness (Gursoy et al. 2004). However, many researchers have also highlighted the role of festivals and events in attracting new money to a local economy and increasing tourist visits in an area (Long and Perdue 1990, MacDonnell et al. 1999, Jackson et al. 2005). Studies by Howell and Bemisderfer (1981), Della Bitta and London (1982), Wilson and Udall (1982), and Getz and Frisby (1988) have analyzed the impacts of festivals on local economies.

Input-output models are often used for analyzing the economic impact of tourism events for a specific region (Fletcher 1989, Johnson 1999). Saayman and Saayman (2006) used an input-output model to estimate the economic impact of three festivals in South Africa. They also demonstrated that the location and size of a festival have a great influence on its economic impact. Using data from festival visitors' expenditures, their model provided

an estimate of the economic impact of the festival, including the effects of visitor spending on income and jobs in the local community.

3.0 METHODS

The present study used a two-stage approach for contacting and surveying American Folk Festival attendees in Bangor. The first stage was an intercept contact with visitors, where they were asked to complete a short questionnaire about demographics and factors that influenced their attendance at the festival. To identify visitors attending only the festival (“exclusive festival visitors”), we asked them whether they would come to Bangor if the festival were not held. Email contact information collected from the first stage was used to distribute a second, online questionnaire, which explored visitors’ satisfaction with the festival, perceptions, and expenditures at the festival and in the Bangor area. To calculate the average expenditures per person, we asked respondents to estimate the amount of spending by their group and indicate the total number of people in the group.

The on-site surveying took place on August 22, 23, and 24, 2008, during the entire duration of the Festival (Friday afternoon, Saturday afternoon and evening, and Sunday afternoon). Attendees completed 953 questionnaires. Twenty-five percent of respondents were surveyed on Friday, 40 percent on Saturday, and 35 percent on Sunday.

Online surveys have the inherent bias of excluding people without Internet access and those who decline to disclose their email addresses for privacy reasons. In this case, the on-site questionnaire collected 602 email addresses from 63 percent of the Stage 1 contacts. Follow-up emails in mid-September asked participants to complete the online survey. Two follow-up email invitations were subsequently sent at 1- to 2-week intervals. Three hundred fourteen questionnaires were completed, for a response rate of 52 percent. The online survey collected information about expenditures for lodging, food, gasoline, entertainment, and various kinds of retail shopping in the area outside of the festival. Visitors also reported the total amount of money spent at the festival for food, arts and crafts, donations, and other items.

An IMPLAN™ (Minnesota IMPLAN Group, Stillwater, MN) input-output model was used to calculate the economic impact of the festival in the Bangor area. Impacts included estimates of aggregate output, income, and employment change attributable to the festival. Estimated dollar multipliers were not available for Penobscot County, so state of Maine multipliers were used to estimate the economic impact in the Bangor area. This method assumes that all vendors were local and that all spending remained in the area. If there was leakage, the calculated impact may actually cover a larger geographic area than just Bangor. This approach is not a cost-benefit analysis because the costs associated with staging the Folk Festival are unknown.

4.0 RESULTS

The total outcome created by the festival in the region was analyzed through two different scenarios. The first scenario included total expenditures for all Festival visitors. The second scenario calculated the impact from the visitors who came to Bangor exclusively because of the festival; thus we excluded expenditures that would have taken place regardless of the festival. Numbers were estimated and total expenditures were calculated for spending both at the festival and in the Bangor area (Table 1).

“Total visits” to the festival were based on a gate count of 168,000 visits provided by festival organizers; this number does not distinguish visitors who attended multiple days. Based on the onsite survey, an estimated 47 percent of “total visits” were by people who attended the festival for 1 day, 30 percent visited for 2 days, and 23 percent attended all 3 days. Using the gate count and these percentages, we estimated that 95,626 individuals attended the festival in 2008.

In the onsite survey, 22 percent of respondents indicated that they went to Bangor specifically to attend the festival. Therefore, of the estimated total number of visitors (95,626), approximately 21,108 are exclusive festival visitors (would not have been in Bangor if there were no festival).

Table 1 shows the estimated breakdown of expenditures by all visitors (n = 95,626) and by exclusive festival

Table 1.—Expenditures by 2008 American Folk Festival visitors

	All Visitors ^a		Exclusive Festival Visitors ^b	
	Expenditures (\$)	Percent	Expenditures (\$)	Percent
Restaurant and/or lounge	\$857,179	21.2	\$181,498	12.2
Gasoline	673,004	16.6	164,174	11.1
Hotel	605,106	14.9	339,675	22.9
Gifts and outdoor equipment	406,535	10.0	129,474	8.7
Grocery and convenience	340,348	8.4	214,812	14.5
Recreation/entertainment	338,447	8.4	103,142	6.9
Other accommodation	309,181	7.6	239,865	16.1
Other shopping	287,088	7.1	31,982	2.2
Artwork and antiques	135,790	3.4	56,981	3.8
Other trip expenses	99,113	2.4	23,986	1.6
Nonfestival Expenditures	\$4,051,789	100.0	\$1,485,590	100.0
Festival Expenditures	\$2,459,781		\$732,387	
TOTALS	\$6,511,570		\$2,217,977	

^a 95,626 estimated people attending the festival.

^b 21,108 estimated people who came to Bangor only because of the festival.

visitors (n = 21,108). Visitors' spending outside the festival was highest for restaurants and/or lounges (21.2 percent), followed by gasoline (16.6 percent), hotels (14.9 percent), and gifts and outdoor equipment (10 percent). For exclusive festival visitors, the highest expenditures were for hotels (22.9 percent) and other accommodations (16.1 percent), followed by grocery and convenience store purchases, restaurants and/or lounges, and gasoline. This pattern makes sense considering that the group coming from outside the area to attend the festival would be more likely to make hospitality expenditures. In both scenarios, visitors' expenditures at the festival itself are more than 50 percent of their total expenditures in the Bangor area.

The input-output model used to evaluate the impact of expenditures in a region describes commodity flows from producers to intermediate and final consumers. IMPLAN software and database were used to develop the regional input-output model. For retail categories, IMPLAN calculated the retail margin, which represents the portion of retail purchases captured in the local economy by retailers who make goods available to consumers. This retail margin, plus purchases of locally produced goods and services, represents the direct impact or direct effect of the expenditures. Using Maine industry multipliers,

IMPLAN calculated the festival's indirect and induced effects on the regional economy. The sum of the direct, indirect, and induced effects represented the total effect of the expenditures in the region because of the festival.

Table 2 presents IMPLAN results for both total visitors and exclusive festival visitors. For all visitors' expenditures, the direct effect was \$6.5 million. The calculated total output multiplier for expenditures was 1.51 for every dollar spent; therefore, the total output generated in the Bangor area because of the festival was estimated to be \$9.8 million.

For exclusive festival visitors, direct effects are estimated to be \$2,217,977 and total effects are almost \$3.5 million.

The employment impact in Table 2 shows that the 2008 American Folk Festival supported an estimated 121 jobs and \$2.8 million of income. IMPLAN estimated the number of jobs using a national average wage. Employment multipliers are generally based on the total number of jobs (full, part, or seasonal jobs). Using data from exclusive festival visitors, an estimated 41 jobs were created because of the festival, with a total income effect of \$928,553 for the workers who held those jobs.

Table 2.—Estimated economic impact of American Folk Festival visitors' expenditures in Bangor Region^a

All Visitors (N = 95,626)					
	Direct	Indirect	Induced	Total	Multiplier
Output	\$6,511,570	\$1,408,227	\$1,934,104	\$9,853,901	1.51
Employment	88	14	20	122	1.39
Income	\$1,745,361	\$ 433,943	\$627,257	\$2,806,561	1.61
Exclusive Festival Visitors (N=21,108)					
	Direct	Indirect	Induced	Total	Multiplier
Output	\$2,217,977	\$482,017	\$639,899	\$3,339,893	1.51
Employment	29	5	7	41	1.40
Income	\$573,464	\$147,560	\$207,529	\$928,553	1.62

^a Calculated using IMPLAN™.

5.0 CONCLUSIONS AND IMPLICATIONS

The 2008 American Folk Festival in Bangor, ME, attracted approximately 95,000 visitors, about 22 percent of whom came to Bangor exclusively to attend the festival. Their expenditures in the area and at the festival had a large impact on the local economy.

To demonstrate the festival's economic impact, expenditures by exclusive festival visitors (those who visited the area specifically to attend the festival) were separated from all visitors' expenditures. Using the IMPLAN input-output model, total output for all visitors was estimated at nearly \$10 million and total output for exclusive festival visitors was estimated at \$3.3 million. Survey data showed that local visitors also increased their normal expenditures because of the festival, especially money spent directly at the event; this amount represents almost 40 percent of total expenditures. For this reason, the final impact is likely to account for more of the \$10 million total output than the \$3.3 million reported by exclusive visitors.

By attracting large numbers of visitors, festivals can bring attention to and help to preserve local arts, culture, and traditions. Festival impacts also include socio-economic benefits at the local, regional, and state level. Festivals can increase demand at tourist attractions and present opportunities for promoting other state and regional attractions to residents and visitors. Using the American Folk Festival to promote other man-made and nature-based attractions in the Bangor area may encourage

visitors to extend the length of their trips to the area and help increase the economic impact of this festival. Specific outreach efforts could include links to other nearby attractions' Websites on the festival Website and having a "Visitor Information Center" booth at the festival.

At the same time, this study found that visitors' highest average expenditures were for lodging and restaurants and that they did not spend significant amounts of money outside the festival on recreation or shopping. This finding suggests the availability of opportunities to encourage spending in these areas to increase the festival's economic contributions to the region. For example, local business-owners could provide more information to festival-goers to promote local services, stores, and restaurants.

To increase the festival's economic impacts, organizers could also encourage return visits by first-time visitors and increase new visits by promoting the festival to out-of-state, car-based tourists. Collaborations with organizers of other music-focused festivals in neighboring states and Canada for free promotional exchanges could provide access to like-minded festival goers without spending scarce advertising dollars. A partnership with another festival in the same geographic area, scheduled either directly before or after the Folk Festival, has the potential to draw week-long vacationers shared by both areas.

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ECONOMIC IMPACT AND MARKET ANALYSIS OF A SPECIAL EVENT: THE GREAT NEW ENGLAND AIR SHOW

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Abstract.—We conducted a post-event evaluation for the Great New England Air Show to assess its general economic impact and to refine economic estimates where possible. In addition to the standard economic impact variables, we examined travel distance, purchase decision involvement, event satisfaction, and frequency of attendance. Graphic mapping of event visitors' home ZIP codes using Google Earth™ provides a visual analysis of the markets for the event.

1.0 INTRODUCTION

In the last 15 years, special events throughout the United States have proliferated, drawing consumers from various local and regional markets and also seeking to create community cohesion and pride (Besculides et al. 2002). These events can create opportunities for exchange, revitalize traditions, enhance the quality of life for local residents, and improve the image of the host community (Clements et al. 1993, Weikert and Kerstetter 1996, Besculides et al. 2002).

Special event sponsors usually aim to create a successful event using a concentrated and refined marketing effort and to demonstrate positive economic gains to the host community. While some activities or special events may be staged simply to generate goodwill toward the sponsoring agency, most must be financially successful in order to continue. For example, nonprofit organizations may hold annual events to raise money for their operations and view these events as major

fundraisers; however, they may also depend on a host community to cover or support a portion of the costs. With the increase in the number of special events comes increased competition among events. Organizers for each event need to identify and target their respective markets segments and market areas.

1.1 Purpose of the Study

The purpose of this study was twofold: 1) to evaluate the Great New England Air Show after the event to assess its general economic impact in the local region; and 2) to conduct a rudimentary market analysis of the event by examining attendees' travel distances, attendance frequency, satisfaction with the event, and purchase decision involvement. Other organizations can use this study's methodology to examine special event market areas, to more fully understand the market behavior of special event attendees, and to more accurately determine the economic significance and impact of special events.

2.0 LITERATURE REVIEW

2.1 Economic Impacts of Special Events

Special events generate economic activity and jobs for the host communities (Frey 1994, Dwyer et al. 2005). It is important for event organizers to have accurate information on the event's past (if applicable) and projected economic impacts to garner community support and justify the allocation of resources for producing the event. Uysal and Gitelson (1994), Walo et al. (1996), Crompton and McKay (1997) Kim et al. (1998), Thrane (2002), Daniels and Norman (2003), and Koh and Jackson (2007) have examined the impact of special events on local economies.

However, travel researchers have debated about the best method(s) for obtaining accurate economic impact figures and making reliable forecasts (Crompton et al. 2001, Tyrell and Johnston 2001, Dwyer et al. 2005, Tyrell and Ismail 2005, Crompton 2006, Styne and White 2006). The August 2006 issue of the *Journal of Travel Research* (Vol. 45, issue 1) focused on measuring

the economic impact of travel, and many critical issues were addressed in articles by Tyrell and Johnston, Stynes and White, Wilton and Nickerson, Frechtling, Cai et al., Smith, Dwyer et al., Crompton, Libreros et al., Smeral, and Bonham et al. Crompton (1995) criticized many of the most common assumptions, methods, and findings of economic impact studies (EIS) and in 2006 asserted that EIS outcomes and findings are often manipulated for political reasons.

The original EIS approach was to apply an Input-Output model like those used in typical tourism studies. More recently, the standard approach has been to implement the Computable General Equilibrium model (Adams and Parmenter 1995, Dwyer et al. 2006) and the recommendations of Crompton (2006). Jackson et al. (2005) have also provided a review of the economic impact literature for events and a “Do-It-Yourself” kit for conducting economic impact studies. Finally, Carlsen et al. (2001) suggested using the Delphi technique with event experts to supplement the standard impact analysis. Information about economic impacts can be combined with marketing concepts to document spending behavior and visitor origin and to provide additional insights into event economics.

2.2 Air Show Research

Special events come in many varieties, but air shows are special multiple-day events that have grown in popularity in the United States and worldwide. An air show is in essence a “sporting event” where flying performances are showcased with thrilling aerobatics, competitions, and displays of aerial feats that participants and spectators do not easily see in any other setting. Typically, an air show also includes a wide assortment of static aircraft and aviation-related exhibits for spectators. Air shows may be commercial in nature, seeking income from patrons and corporate sponsors. However, air shows held at military bases are generally free and serve as public relations and community events as part of the base’s community outreach and involvement. Air shows at civilian airports typically charge visitors an admission or parking fee.

Air shows are held on large exhibition grounds, such as local or regional airfields or military installations, and

they are well positioned to draw very large crowds. A recent *Los Angeles Times* article reported that recession-weary families looking for affordable entertainment are increasingly turning to air shows (Zimmerman 2009). The article also mentioned that the International Council of Air Shows expects air show attendance to reach 15 million people in the U.S. in 2009, up from the typical 10-12 million in previous years; this increase follows attendance patterns after recessions in the 1980s and 1990s. Because of their “draw” and “reach” potential, air shows are attractive to corporate sponsors hoping to reach a motivated or targeted population.

Westover Air Reserve Base in Chicopee, MA, is the staging location of the Great New England Air Show (GNEAS). The GNEAS has been held at this location approximately 20 times over the past four decades, about once every 2 to 3 years. During its long history, there has been no previous study of the air show’s economic contributions to the region or any detailed market analysis of attendees. Other air shows are held periodically in Rhode Island, Maine, and nearby New York state. Next to the Boston Marathon and First Night Events in the major New England metropolitan areas, this 2-day event is one of the largest special events in New England, attracting 300,000 to 400,000 visitors over one weekend, usually in the early fall.

Little academic research has been done on air shows. A comparative study in the *Journal of Vacation Marketing* by Nicholson and Pearce (2000) studied attendance and attendees at four special events on New Zealand’s South Island: two food/beverage shows, a music festival, and an air show. They found that the four events attracted significantly different types of visitors and that the air show visitors were predominantly male (63 percent); were evenly distributed across occupation types; had higher average household incomes than attendees at the other events; tended to have children; were evenly split between first-time and repeat visitors; and were mostly tourists from outside the immediate area (90 percent), not local residents. Nicholson and Pearce emphasized that characterizing event participants needs to go beyond the typical socio-demographic variables to examine other means of market segmentation.

The International Council of Air Shows (ICAS) (International Council of Air Shows 2009) collects data on demographic and travel characteristics of spectators at air shows throughout North America. ICAS's most recent data indicate that 75 percent of all air show attendees travel 49 or fewer miles to these events, 22 percent travel 21 to 49 miles, and 53 percent travel less than 20 miles. Such travel characteristics are often used to establish the extent of visitor spending impacts at air shows and other special aviation events.

3.0 OBJECTIVES AND METHODS

This was the first attempt to measure the baseline economic impact of the Great New England Air Show, to conduct a geographic market analysis, and to apply market techniques in a structured research analysis. We developed a comprehensive survey instrument based on the framework of an EIS of other special events and divided it into six parts, plus space for open-ended comments on selected items. The sections were: 1) interest in the GNEAS and previous experience with air show events; 2) motivation to visit the GNEAS and Pioneer Valley of Massachusetts; 3) purchase decision involvement in air shows and GNEAS; 4) travel behavior related to GNEAS and the Pioneer Valley Region; 5) economic impact expenditures and analysis; 6) demographic profile of visitors; and 7) visitors' open-ended comments. The resulting data provide the basis for estimating the GNEAS's economic impact and help to measure other important parameters crucial to understanding the overall market and visitor dynamics by geographic or trade market areas.

The GNEAS was held at the Westover Air Base on the weekend of September 6-7, 2008. The gates to the airbase opened at 8:00 a.m. each day. The show started at 9:00 a.m., and the event ended both days with the Thunderbird fighter jets' performance at 5:00 p.m. The event had no admission fee and was open to the public.

Outside researchers did not review the survey instrument, but the survey included standard EIS statements as recommended by Crompton (1995), Stynes (1998), Crompton et al. (2001), and Tyrell and Johnston (2001). The survey also included three standard market analysis

questions on purchase decision involvement developed by Mital (1983) that have proven to have high validity and reliability in previous research. Sixty pilot-study participants were intercepted and interviewed at random locations on the airbase during both days of the event. The pilot study served as the basis for improving the survey instrument. Pilot-study participants also were asked to provide an email address if they wanted to take the complete survey online after the show.

Before the event, GNEAS attendees could register for the event itself at the official GNEAS Website to obtain important event information, coupons, and special incentives, including a free air show poster. From the online registration process, the Galaxy Community Council, the organization sponsoring the event, provided the research team with a list of registrants' email addresses. This list was combined with the email address list from pilot-study participants for a total of 3,078 individuals in the survey population.

After the GNEAS event, a revised version of the survey was posted online utilizing Qualtrics™ (Qualtrics, Inc., Provo, UT) survey software. The 3,078 individuals were contacted by email about completing the survey in two waves within 2 weeks of the event and data collection was conducted over 4 weeks, concluding on October 20, 2008. A modified Dillman (2007) reminder technique was utilized to ensure higher response rates. Promotion coupons were included as an incentive to boost the response rate. Reminder emails were sent on October 5-6 and October 14, 2008. The system automatically sent "Thank You" notes when surveys were completed.

The response rate was 33.9 percent and 1,109 surveys were filled out completely. Six surveys were not deliverable due to incorrect email addresses and 89 incomplete surveys were discarded.

4.0 SURVEY RESULTS

4.1 Demographic and Attendance Information

The visitors to the GNEAS were very interested in aircraft in general, and approximately 57 percent stated that this interest was their primary reason for attending

the air show. The second most popular reason for attending was “entertainment for the family” (32 percent of respondents). The sample survey population was 68 percent male. The average age of the respondents was 44.8 years; 6 percent were under age 24, 18.6 percent were 25-36 years, 38.5 percent were 37-48 years, 26 percent were 49-60 years, and 11.3 percent were 61 years or older. About 51 percent of respondents had a gross household income of less than \$75,000 a year, and 72 percent earned less than \$100,000.

About 48 percent of respondents had a college or post-graduate degree. Sixty-three percent were repeat visitors to the GNEAS with an average of four previous visits. Slightly more than two-thirds (68 percent) of survey respondents were highly involved in the decision to attend the event. More than 93 percent of the sample reported that that were interested to extremely interested in air shows; 38 percent indicated extreme interest. Approximately 85 percent indicated that the Great New England Air Show in particular was important to extremely important to them, and 29 percent indicated that it was extremely important.

On a 7-point scale, average overall satisfaction with the GNEAS experience was 5.5. Almost 85 percent of the respondents indicated that they would like to attend the event again. Only 3.7 percent indicated that they would not return. However, a comparison between first-time visitors and repeat visitors revealed that approximately 25 percent of the first-time visitors said that they were unlikely to return to the GNEAS in the next 2 years. These respondents gave a rating of 4 or less on the 7-point scale when asked about likelihood to return.

Westover Air Force base personnel used aerial views and on-the-ground counts to estimate total 2-day attendance at 345,000 with 28 percent attending on the first day. Only 11 percent of the survey sample attended both days. The average length of time respondents spent at the show was 5.6 hours and 60 percent of the sample indicated that they would not have come to visit the Pioneer Valley Region those days if there had been no air show. The average group size was 2.5 adults and 1.3 children or dependents for an overall average group



Figure 1.—Map of GNEAS Markets. Note: Each circle symbol represents a ZIP code that had attendees at the GNEAS. The yellow pin, slightly left of center, is the GNEAS location.

size of 3.8. The average distance traveled one-way by the visitors to the show was 45.14 miles (measured by straight-line, not travel, distances between the event and primary residence ZIP codes). Approximately 77 percent of the respondents had traveled less than 65 miles and almost every visitor in the sample had traveled less than 200 miles.

4.2 Visual Analysis of Geographic Trade Market Area

Survey takers were asked to put in their primary residence ZIP code or put ‘N/A’ if they resided in the immediate area of the GNEAS. Approximately 39 percent used ‘N/A’ to indicate that they were residents of the area while 61 percent were visitors. The primary residence ZIP codes of the survey subjects were put into a Microsoft™ Excel spreadsheet file and uploaded to Google Earth™ to create a map of the event’s market area. Figure 1 is a view of the whole region with the GNEAS venue marked with a yellow pin. The map includes Massachusetts, Connecticut, Rhode Island, southern portions of Vermont and New Hampshire, northeastern Pennsylvania, northern New Jersey, and eastern sections of New York state. The white points represent primary residence ZIP codes provided by participants but do not indicate the intensity of participation (number of participants) from each ZIP code. The visual analysis here shows that the majority of the GNEAS market is east and south of the venue. Only a few visitors traveled from Vermont and almost none came from Maine.

Table 1.—Attendees’ Direct Expenditure Estimates by Category for GNEAS

Category	Direct Impact
Refreshments at the event	$345,000 \times (\$20.53/3.77) = \$1,878,740$
Food/drinks before or after the event	$345,000 \times (\$17.51/3.77) = \$1,602,374$
Souvenirs or gifts	$345,000 \times (\$14.80/3.77) = \$1,354,377$
Clothing or accessories	$345,000 \times (\$3.93/3.77) = \$359,641$
Transportation	$345,000 \times (\$24.47/3.77) = \$2,239,297$
Local attractions	$345,000 \times (\$2.10/3.77) = \$192,175$
Overnight accommodations	$345,000 \times (\$12.26/3.77) = \$1,121,936$
Other	$345,000 \times (\$2.40/3.77) = \$219,628$
Total	$345,000 \times (\$98.00/3.77) = \$8,968,169$

4.3 Economic Impact Findings of GNEAS

One of the objectives of this project was to understand and gauge the economic significance and impact of the air show on the region. Among survey respondents, the average spending per group was \$98. Expenditures were divided into the following main categories as suggested by economic impact researchers Styne (1998), Stevens (2008), and Bojanic (2008): 1) refreshments; 2) food/drinks before or after the event; 3) souvenirs and/or gifts; 4) clothing or accessories; 5) transportation costs; 6) local attractions; 7) overnight accommodations; and 8) “other” expenditures. The largest average expense was transportation (\$24.47 per group) followed by refreshments at the event (\$20.53 per group) and then food/drinks before and after the event (\$17.51 per group). The lowest expenditure category was local attractions (\$2.10 average per group).

4.4 Direct Economic Significance

As mentioned previously, an event’s direct economic impact includes spending by visitors at local businesses and at the event itself. This total involves the expenditures each person made specifically for this trip. Therefore, the direct economic significance is:

$$\begin{aligned}
 &345,000 \text{ (Estimated total population at the show)} \\
 &\times \$98/3.77 \text{ people (Average spending per group} \\
 &\text{divided by group size = average spending per person)} \\
 &= \$8,968,169.
 \end{aligned}$$

A more detailed overall direct estimate of spending by visitors for each category is in Table 1.

However, Crompton (2006) notes that one of the more significant shortcomings of economic impact studies is the inclusion of local residents in the spending analysis since it is impossible to know how much they might have spent in the area during the event even if they had not attended. Of the estimated 345,000 attendees at the show, an estimated 60.87 percent or 210,002 (based on survey results) were visitors from outside the immediate area. Their direct economic impact is estimated to be:

$$\begin{aligned}
 &210,002 \text{ (Total visitors at the show, excluding local} \\
 &\text{population)} \times \$98/3.77 \text{ (Average spending per} \\
 &\text{person)} = \$5,457,952.
 \end{aligned}$$

4.5 Direct, Indirect, and Induced Economic Impact—The Multiplier Effect

Officials at the Massachusetts Office of Travel and Tourism suggested using an economic impact multiplier of 1.5 for the Pioneer Valley of Massachusetts (D’Agostino 2009). Based on the above numbers, the overall economic significance estimate for all attendees, including direct, indirect, and induced effects would be:

$$\begin{aligned}
 &\text{Overall Economic Significance of GNEAS:} \\
 &345,000 \text{ (estimated attendance at the GNEAS)} \times \\
 &\$98/3.77 \text{ (Average spending per visitor)} \times 1.5 = \\
 &\$13,452,255.
 \end{aligned}$$

The shortcoming of this estimate is that it is not based on “new money” being spent in the host community by visitors from outside the community (Crompton 2006). Some may suggest that this estimate is acceptable anyway since this rare and special event probably does

not displace other local spending. This estimate may also actually represent money that stays in the community instead of leaking out as families, particularly during the recessionary period of 2008-2009, elected to stay closer to home, rather than traveling to other destinations or event locations. If the event attendees and impact were adjusted to exclude local residents, the overall economic impact with the estimated multiplier would be:

210,002 (*Total visitors from outside the area at the show*) x \$98/3.77 (*Average spending per visitor*) x 1.5 = \$8,188,255.

While these are estimates, they are a very conservative look at the dollars generated by the GNEAS. This research did not, for example, include show vendors, civilian volunteers, military personnel who staffed the Website and assisted with event coordination on the base, or air show participants even though all of these people probably spent some money at the air show and/or in the local area.

5.0 DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

5.1 Air Show Impacts—Substantial and Adjusted

This analysis of Great New England Air Show visitors demonstrates that a range of estimates can be generated by examining attendees' spending behaviors and making different assumptions. When overall direct expenditures by all air show attendees are calculated, the results can be overstated and misleading, as suggested by Crompton (1995 and 2006). In the case of the GNEAS, when all visitors are counted and an economic multiplier is applied, the overall economic impact is estimated to be nearly \$13.5 million for the 2-day event. When local residents are removed from the analysis, the economic impact estimate with the multiplier applied was only \$8.2 million.

5.2 Graphic and Qualitative Analysis of Visitor Markets

In this analysis, the map of survey respondents' ZIP codes is a coarse but nonetheless informative depiction of the event's markets. This application has additional benefits and can be extended. For example, more detailed

maps of first-time visitors' residential ZIP codes could be highlighted or separated. Highly involved, loyal visitors' geographic distribution might also be of interest. When the maps and other survey data were presented to event organizers, they noticed immediately that the show was popular among residents of Worcester and Boston, MA, and Hartford, CT, and concluded that the event might benefit from additional promotion in those markets. Furthermore, it was clear that there were few attendees from Albany, NY; Providence, RI; and the state of Maine, possibly because there are competing air shows or other events in those regions.

From the perspective of logistics and operational management, it is helpful to have a clearer idea of how many attendees to expect each day and which direction they will come from in order to plan traffic and crowd management. In this case, the mapping showed that the majority of arriving groups came from south and east of the event site. Although not presented here, open-ended responses on the survey included a large number of complaints about traffic to and from the event, parking problems, and the distance from the venue to the parking areas. Isolated complaints also came from visitors who were unable to get to the event because of excessive traffic congestion.

5.3 Profile of Air Show Visitors

The profile of GNEAS attendees is similar to national findings and published information about other air shows. For example, the most recent ICAS report indicates that air show visitors reported gross household incomes in excess of \$50,000 while the GNEAS indicated that nearly 50 percent had gross household incomes in excess of \$75,000. ICAS reports that about 75 percent of air show visitors travel less than 50 miles one-way and the GNEAS survey respondents traveled an average of 45 miles one-way to the event. The Zimmerman (2009) *Los Angeles Times* article reported that a family of four can attend an air show for far less than the \$256 it would cost them to visit Disneyland. For the GNEAS, the average expenditures for a group of about four people were \$98. The visit to the GNEAS was a day trip for most family groups in the survey.

5.4 Limitations, Implications, and Importance of Trade Market Analysis

Analysis of the trade market and geographic context of a special event yields additional insights into how special event market behavior varies and how EIS can be adjusted. While both visual and identified markets were presented here, it is important to know whether special events have real and substantial impacts. Behavioral information such as distance traveled, purchase decision involvement, likelihood to return, and repeated visitation helps to further qualify and improve estimates of economic impacts.

Economic impact studies are estimates calculated using sample data. It is important to have accurate counts of attendance and data from a truly representative sample of attendees, although accuracy is not always possible. One limitation of this research is that the researchers themselves did not attempt to estimate attendance, instead using the official attendance estimate compiled by U.S. military personnel who staffed the entry points, took entrance counts, made flyovers of the area during peak periods, and monitored parking lot accommodation accounts. These estimates could and probably do vary from the real number of visitors. In addition, attempts to obtain a true, random sample are difficult even in the most ideal conditions. Random intercepts and event registration at an online site helped to yield a large sample population (more than 3,000 individuals), but there is no way to know how truly representative the sample is. This study more than likely under-represented lower-income attendees, older people, and others who do not have access to the Internet or email accounts. Hispanics and international visitors are not well represented in the sample and may have been missed. No Spanish version of the survey was made available online and it is recommended that future research be conducted in both English and Spanish. The survey used a post-event assessment within 4 weeks of the event and accurate recall could be an additional concern in expenditure estimates. Finally, this free event occurred when gas prices in the Northeast were at or near \$4 per gallon, so it may have attracted more local and regional visitors than in other years when gas prices were lower.

Crompton's (1995 and 2006) recommendations for adjusting and more honestly portraying the real economic impacts of special events are particularly relevant here. Expenditures noted in this survey cannot all be fully or accurately defined as "new money" (expenditures linked directly to the event that would not have occurred without the event) coming into the local economy. For example, the most expensive category of expenditures was transportation, and the cost of gas probably dominated and inflated those figures. However, it would be incorrect to assume that all of the gas was purchased locally. In fact, it is likely that many or most visitors fueled up at home and drove to Westover Air Base and returned home without refueling. Likewise, not all food consumed at the event was purchased on-site. Researchers observed that many attendees brought (presumably full) coolers from off-site to the GNEAS and many survey respondents also complained about the high cost of food at the vendor tents in their open-ended responses on the survey.

This research included a fully online survey that was pre-tested during intercept interviews at the event itself. For many types of events, online surveys have numerous advantages. First, the response rates are generally higher than for traditional mail-in surveys and responses rates can be enhanced by offering incentives, as in this study. A response rate higher than 30 percent is very good for this type of event.

Recommendations for future research include working with private vendors and corporate sponsors to collect email addresses, offering more or varying incentives for survey participation, and making available on-site response kiosks to help gather email addresses. In this study, 400 surveys were completed within the first week of distribution by email. Using online software such as Qualtrics™ or Survey Monkey™ (Survey Monkey Co., Menlo Park, CA) greatly simplifies the survey process for researchers and respondents. The online survey process also reduces survey administration costs, reduces data entry problems, and increases survey response rates and the accuracy and readability of written responses. Furthermore, online survey software facilitates tracking of respondents and nonrespondents.

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The content of this paper reflects the views of the authors(s), who are responsible for the facts and accuracy of the information presented herein.

*MANAGEMENT AND USE OF
PARK, RECREATION, AND
TOURISM RESOURCES*

MANAGEMENT IMPLICATIONS OF CHANGES IN RECREATION ACTIVITY MOTIVATION ACROSS PHYSICAL SETTINGS

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Abstract.—Outdoor recreation management frameworks suggest that a diverse set of recreation opportunities is necessary to meet the needs and desires of a diverse population of recreationists. Managers of recreation resources must understand recreational demand if they wish to provide high-quality recreation opportunities to their users. The purpose of this study was to examine possible relationships between recreational activity choice, setting choice, and motivations among adult U.S. citizens who participated in one of four activities: hiking, walking, sightseeing, and camping in developed campgrounds. Data used in this study came from the National Survey on Recreation and the Environment. Between-groups analysis of variance was used to test for differences in mean importance scores for 13 motivations across seven environmental settings. Significant differences were found between motivation importance scores across the seven environmental settings for three of the four study activities. Results and implications are discussed.

1.0 INTRODUCTION AND BACKGROUND

Understanding people's motivations for participating in outdoor recreation activities has been a primary interest of many contemporary outdoor recreation researchers and managers. Manning (1999) explained that, historically, methods for measuring recreation use and demand often focused on descriptive variables, such as participation rates for specific activities within

specific settings. In the late 1960s and 1970s, however, many recreation professionals became aware that while descriptive information on participation in outdoor recreation activities is useful, it has limited potential for truly understanding public demand for and quality of outdoor recreation opportunities because it ignores many aspects of the recreation experience. Driver and Toucher (1970) proposed a behavioral approach to recreation management, which has been widely adopted among recreation professionals and organizations. The behavioral approach to recreation management defines recreation as an experience that results from participation in recreational engagements. Participation in an activity is merely one of several aspects of the overall recreational experience. This approach is based on expectancy theory, which suggests that people pursue specific recreational activities within specific settings in order to realize some set of psychological outcomes/benefits (Manning 1999).

As explained by Manning (1999), early researchers adopting the behavioral approach to recreation management aimed their examinations towards a better understanding of the reasons that people choose to participate in recreational engagements, the satisfactions that people receive from those engagements, and the long-term benefits that are realized by individual recreationists, groups, and society in general. Four levels or hierarchies of demand for outdoor recreation have been identified (Driver and Brown 1978, Haas et al. 1980, Manning 1999). The first level simply describes a demand for opportunities to participate in specific recreational activities, such as camping, hiking, or fishing. The second level involves a demand for the settings in which outdoor recreational activities take place. Recreational settings are often discussed in terms of three dimensions: managerial, social, and environmental/physical. Different combinations of each of these three setting dimensions represent distinct recreational opportunities, each potentially providing recreationists with a different type of recreational experience. This approach is an underlying theme of the widely adopted Recreation Opportunity Spectrum (ROS) concept,

which suggests that different types of settings should be provided to meet the needs and preferences of a diverse population of recreationists and ensure the provision of high-quality public recreation opportunities (Driver and Brown 1978, Clark and Stankey 1979).

The third level of demand for outdoor recreation involves understanding individuals' motivations for participating in recreational activities within various settings. Much research has been conducted to identify people's recreational motivations. In the 1970s, Driver and associates began compiling a list of several scale items that were meant to encompass the range of motivations that people have for recreation participation (Manning 1999). These scales, also known as the Recreation Experience Preference (REP) scales consisted of 21 domains (e.g., achievement, autonomy, risk taking, learning, enjoying nature, creativity), with each domain consisting of additional subdomain scale items. The REP scales have been widely adopted for measuring motivations for outdoor recreation, and the motivations examined in this study were chosen based on previous REP research. The fourth and final level of demand for outdoor recreation involves understanding the higher-order benefits that individuals and society derive from recreation participation. These benefits could be personal, social, economic, or environmental in nature.

Much research has attempted to understand the relationships among the four levels of demand described above, although further inquiry is needed (Manning 1999). The purpose of this study was to examine possible relationships among the first three levels (recreational activity choice, setting choice, and motivations). Several researchers have examined the relationships among these levels of demand but most have operationalized the recreational setting based on ROS descriptors or other similar classifications (e.g., level of development, number of people/social atmosphere). Unlike previous research, this study attempted to examine differences in motivations across very broad and general categories of environmental settings (e.g., forest, grassland, coastal waters) without consideration of site-specific attributes regarding the social or managerial settings dimensions. Such an operationalization provided an opportunity

to better understand the possible relationships among environmental setting, recreation activity choice, and motivations.

2.0 METHODS

Data used in this study came from the National Survey on Recreation and the Environment (NSRE). The NSRE is a nationwide, household, random-digit-dialed telephone survey of Americans 16 years of age and older. It gathers information about people's recreational habits, recreational trends, and environmental attitudes and behaviors. The NSRE is co-sponsored by the U.S. Forest Service, the University of Georgia, and other agencies, and is part of a long-term series of surveys that have been periodically conducted since the creation of the Outdoor Recreation Resources Review Commission in the mid-20th century. Data used in this study came from the most recent surveys, which took place in 2005 and 2008.

Three NSRE variables were included in this study: primary outdoor recreation activity, recreational setting choice, and motivations for recreational engagements. Respondents received a list of more than 80 outdoor recreation activities and were asked to indicate which they had participated in within the past year. Respondents were then asked:

Of all the outdoor recreation activities you participated in during the last 12 months, which do you consider to be your main activity?

Respondents then received a list of seven broad setting categories and asked to indicate which of the settings they had visited for their main activity. The question read as follows:

In which of the following settings did you mainly do this activity?

- 1) Coastal waters, including bays, beaches, or the ocean
- 2) Inland freshwater lakes, rivers, streams, or ponds
- 3) A forest
- 4) Open grasslands or meadows with few or no trees
- 5) An urban or suburban park
- 6) Desert

Table 1.—Between-groups ANOVA to identify differences in motivations to go Sight Seeing in seven settings

Motivation	df	F	P	Mean	SD
Be with family	7	1.03	.41	4.33	1.11
Be outdoors	7	0.76	.62	4.29	1.00
Get away from the demands of life	7	1.65	.13	4.22	1.14
Experience nature	7	0.92	.48	3.97	1.16
Be with friends	7	0.31	.94	3.85	1.29
See wildlife I have not seen before	6	1.14	.34	3.68	1.31
View wildlife	6	1.17	.32	3.52	1.25
For health reasons	7	0.92	.48	3.09	1.64
Physical exercise or training	5	1.09	.37	2.94	1.48
Near my home	7	1.10	.36	2.93	1.80
Have a challenging outdoor experience	7	0.80	.58	2.83	1.57
Improve outdoor skills and abilities	6	0.85	.53	2.52	1.41
Be alone	7	1.24	.28	2.38	1.51

*significant at the .05 level

7) Mountains

8) Other

9) Don't know

10) Refused

Finally, respondents were asked to provide information about their motivations for choosing each setting for their main activity. Importance scores for 13 motivation items were gathered using a 5-point Likert-type scale. Exact phrasing of the question was as follows:

From the following list of motivations or reasons, would you please tell me on a scale from 1 to 5, with 1 being 'Not At All Important' and 5 being 'Very Important', how important was each motivation or reason in choosing [setting] to [activity]?

1) Near my home

2) To experience nature

3) To get away from the demands of life

4) To see wildlife I have not seen before

5) To be with family

6) To be alone

7) To be with friends

8) To be outdoors

9) For health reasons

10) For physical exercise or training

11) To view wildlife

12) To improve outdoor skills and abilities

13) To have a challenging outdoor experience

Between-groups Analysis of Variance (ANOVA) was used to test for differences in motivation importance (dependent variable) across seven settings (independent variable) for four different activities (grouping variable). The four activities chosen for analysis in this study were sight seeing, hiking, walking, and camping in developed campgrounds. These four were selected because they commonly occur across a variety of different environmental settings.

3.0 RESULTS

Table 1 displays the ANOVA results for the activity of sight seeing. As shown, none of the ANOVAs were significant, indicating that the importance of motivations for choosing environmental settings for sightseeing did not differ across the seven settings.

Table 2 displays the ANOVA results for hiking across seven settings. The importance of two motivations significantly varied across settings: for health reasons ($p = .01$) and to be near my home ($p < .01$). Unfortunately, cell counts were insufficient to perform post-hoc analysis and we could not identify exactly where those differences existed.

Table 2.—Between-groups ANOVA to identify differences in mMotivations to hike across seven settings

Motivation	df	F	P	Mean	SD
Be outdoors	7	0.88	.52	4.82	0.51
Experience nature	7	0.90	.50	4.75	0.57
Get away from the demands of life	7	1.10	.36	4.41	1.06
Physical exercise or training	7	0.84	.55	4.08	1.06
For health reasons	7	2.72	.01*	3.87	1.36
View wildlife	7	0.77	.61	3.80	1.12
Be with family	6	1.41	.21	3.66	1.50
Have a challenging outdoor experience	7	0.91	.50	3.54	1.21
Be with friends	7	0.86	.53	3.48	1.34
See wildlife I have not seen before	7	0.52	.81	3.36	1.35
Improve outdoor skills and abilities	7	1.09	.37	3.11	1.29
Near my home	7	3.36	.00*	2.89	1.34
Be alone	6	1.14	.34	2.54	1.33

*significant at the .05 level

Table 3.—Between-groups ANOVA to identify differences in motivations to Camp in Developed Areas in seven settings; setting is the independent variable and motivation is the dependent

Motivation	df	F	P	Mean	SD
Be outdoors	6	1.75	.12	4.71	0.75
Get away from the demands of life	7	1.07	.38	4.49	1.03
Be with family	7	1.38	.22	4.35	1.30
Experience nature	7	2.44	.02*	4.13	1.05
Be with friends	7	1.05	.40	3.78	1.41
View wildlife	6	1.15	.34	3.62	1.20
See wildlife I have not seen before	7	1.44	.20	3.48	1.30
For health reasons	6	0.83	.54	3.45	1.64
Physical exercise or training	7	0.46	.85	3.26	1.27
Have a challenging outdoor experience	7	1.48	.18	2.82	1.29
Improve outdoor skills and abilities	6	2.06	.06	2.78	1.20
Be alone	7	0.75	.62	2.42	1.52
Near my home	6	1.27	.28	2.35	1.20

*significant at the .05 level

Table 3 displays the ANOVA results for camping in developed campgrounds. Only the motivation to experience nature significantly differed across the study settings ($p = .02$). However, the p-value for the motivation to improve outdoor skills and abilities was 0.06, suggesting possible differences between settings. Again, cell counts were not sufficient to perform post-hoc analysis for the activity of camping, so we could not determine which specific settings differed in importance scores for the motivation to experience nature.

Table 4 displays the ANOVA results for walking. The importance of several motivations to walk differed across the study settings. Significant differences were found between the following motivations to walk: to experience nature ($p < .01$), to be near my home ($p = .02$), to be with friends ($p = .01$), to view wildlife ($p < .01$), to view wildlife not seen before ($p < .01$), and to have a challenging outdoor experience ($p = .01$). The motivations to be alone and to get away from the

Table 4.—Between-groups ANOVA to identify differences in motivations to walk in seven settings

Motivation	df	F	P	Mean	SD
Be outdoors	7	1.49	.16	4.52	0.90
For health reasons	7	1.46	.17	4.41	1.07
Physical exercise or training	7	1.06	.38	4.25	1.12
Get away from the demands of life	7	1.89	.06	4.03	1.37
Experience nature	7	7.49	.00*	3.91	1.33
Near my home	7	2.34	.02*	3.77	1.44
Be with family	7	0.98	.44	3.59	1.58
Be with friends	7	2.47	.01*	3.28	1.52
View wildlife	7	4.69	.00*	3.17	1.44
See wildlife I have not seen before	7	5.35	.00*	2.97	1.59
Improve outdoor skills and abilities	7	1.06	.38	2.95	1.69
Have a challenging outdoor experience	7	2.50	.01*	2.80	1.54
Be alone	7	1.90	.06	2.62	1.66

*significant at the .05 level

Table 5.—Post-hoc analysis to identify specific differences in mean motivational scores across different types of settings, for the activity of walking; setting is the independent variable and motivation is the dependent

	Setting							
	(a) Coastal waters	(b) Inland freshwater	(c) Forest	(d) Grasslands	(e) (Sub) Urban park	(f) Desert	(g) Mountains	(h) Other
Motivation to Walk								
1 Near my home	3.1 ^{eh}	3.7	3.6	3.5	3.9 ^{ag}	3.7	3.1 ^{eh}	3.9 ^{ag}
2 Experience nature*	4.4 ^{eh}	4.3 ^h	4.6 ^{eh}	4.0	3.8 ^{ac}	3.4	3.9	3.2 ^{abc}
3 Get away from the demands of life	4.3	4.2	4.0	4.1	4.0	4.0	4.6 ^h	3.6
4 See wildlife I have not seen before	3.5 ^{eh}	3.4 ^{eh}	3.4 ^{eh}	3.6 ^{eh}	2.7 ^{abcd}	3.1	3.5 ^h	2.5 ^{abcdg}
5 Be with family	3.9	3.4	3.4	3.4	3.5	4.1	4.1	3.4
6 Be alone	2.6	2.4	3.1	3.1	2.4	3.1	2.2	2.6
7 Be with friends	3.6 ^{dh}	3.4 ^d	3.1	2.6 ^{abeg}	3.3 ^{dh}	2.5	3.6 ^d	2.8 ^{ae}
8 Be outdoors	4.5	4.8	4.6	4.7	4.4	4.3	4.5	4.3
9 For health reasons	4.2	4.4	4.1	4.3	4.4	3.9	4.3	4.5
10 Physical exercise or training	3.9	4.2	4.2	4.3	4.2	3.7	4.1	4.4
11 View wildlife	3.6 ^{eh}	3.7 ^{eh}	3.5 ^{eh}	3.5 ^{eh}	3.0 ^{abcd}	3.7 ^h	3.2	2.7 ^{abcdf}
12 Improve outdoor skills and abilities	2.7	2.9	2.9	3.3	2.8	3.3	3.5	3.2
13 Have a challenging outdoor experience*	3.1 ^f	3.1 ^f	2.6 ^f	3.0 ^f	2.7 ^f	1.3 ^{abcdegh}	3.0 ^f	3.0 ^f

*Tanhane's T2 used due to unequal variances; LSD used for all other post-hoc analyses.

For those motivation means that were significantly different across settings, superscript letters identify the setting groups (columns) between which differences in mean motivation scores existed (rows). For example, the cell value "3.1^{eh}" indicates that the mean of 3.1 was significantly different from the mean scores reported in the urban park (column e) and other (column h) setting categories.

demands of life approached significance at the $p < .05$ level, but were not included in the post-hoc analysis.

Table 5 displays the post-hoc analyses to show specific differences in motivation importance scores when choosing settings for the activity of walking. As shown,

the mean importance score for the motivation to be near my home was significantly lower for coastal water settings (mean = 3.1) than for (sub)urban park settings and other settings (mean = 3.9). The mean importance scores of the motivation to experience nature were significantly higher when choosing to walk in coastal water and

forest settings (means = 4.4 and 4.6, respectively) than when choosing (sub)urban park and other settings (3.8 and 3.2, respectively). For the motivation to see wildlife not seen before, the mean importance scores were significantly lower when choosing to walk in (sub)urban park settings than when choosing several of the other settings. The same pattern was true for the general motivation to view wildlife (i.e., the motivation was more important when choosing to walk in coastal water, inland freshwater, forest, and grassland settings than when choosing to walk in [sub]urban park and other settings). Mean importance scores for the motivation to be with friends were significantly higher when choosing to walk in mountain, coastal water, inland freshwater, and (sub)urban park settings (means = 3.6, 3.6, 3.4, and 3.3, respectively) than when choosing to walk in grassland settings (mean = 2.6). These results may indicate that the American population perceives walking in grasslands as a less social experience than walking in other outdoor settings. Finally, the mean importance scores for the motivation to have a challenging outdoor experience were significantly lower when choosing to walk in a desert setting (mean = 1.3) than when choosing to walk in all of the other settings examined in this study. These results suggest that the American population typically may not seek as challenging an outdoor experience when walking in desert settings than they would when walking in other outdoor environmental settings.

4.0 DISCUSSION

The results of this study suggest that motivations can differ in importance when choosing settings for specific recreation activities. Participants in three of the four activities examined in this study reported significant differences regarding the importance of many motivations for choosing setting-activity combinations. As can be seen by examining the results in Tables 1 through 4, the motivations with the highest mean importance scores were similar across all study activities. That is, the motivations to be with family, to be outdoors, to get away from the demands of life, to experience nature, and for physical exercise or health reasons were all common among the top few most important motivations for choosing a setting for an activity. These results are not surprising, as the most

important motivations tended to be those that could be easily fulfilled through participation in various activities within several different outdoor settings (e.g., the motivation to be outdoors could easily be fulfilled in any outdoor recreational setting). Mean importance scores of motivations that did differ across settings tended to be those that were secondary to the above-mentioned motivations of highest importance. However, researchers should use caution when interpreting these results. As Manning (1999) pointed out, people attempt to fulfill several motivations during their recreational pursuits and many general motivations seem to be almost universal to outdoor recreation activities and settings. Consequently, recreation professionals wishing to provide the public with recreational opportunities that will fulfill their motivations should not discount these secondary motivations. Rather, secondary motivations that differ across settings might be most useful to managers wishing to align their services with the needs and preferences of the public.

Several of the mean importance score differences for motivations were found between the (sub)urban park setting and many of the other, perhaps less-developed, settings. That is, a respondent might associate a (sub)urban park setting with a higher amount of development than other settings in this study, such as coastal and freshwater, mountain, desert, forest, and grassland settings. As many of the differences found in this study were between (sub)urban park settings and a variety of other study settings, the results may lend support for the setting operationalizations outlined in the ROS framework (i.e., managerial and social and physical setting descriptors).

More research is needed to better understand the relationships among the four levels of recreational demand proposed by Driver and associates: activities, settings, motivations, and higher-order benefits. Analyses such as those reported in this study could be useful to managers wishing to examine the comparability or substitutability of various recreational settings with the idea of providing similar or different types of recreational experiences. In general, the results of this study suggest that while the importance of some motivations for

choosing settings for specific activities significantly differs across broad environmental settings, the motivations with the highest importance for choosing activity-setting combinations did not. More research is needed to examine the motivations of people engaging in outdoor recreational activities not included in this study.

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LEISURE RESEARCH

LEISURE RESOURCEFULNESS AS A PREDICTOR OF LEVEL OF AFFLUENCE AND LIFE SATISFACTION: HAVING MORE OR DOING WITH LESS

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Abstract.—This research examines the role of affluence in guiding lifestyle orientation in contemporary society. The term “affluenza” is used to denote a lifestyle of consumption and materialism to achieve life satisfaction. The counter to affluenza is quality of life as manifested in self-improvement, community centeredness, and environmental stewardship. Leisure resourcefulness is knowing how and being able to make a meaningful life for oneself within the individual, cultural, and environmental constraints. Measures of affluenza, leisure resourcefulness, and life satisfaction are examined for their interrelationships and implications for individual lifestyles and quality of life.

INTRODUCTION

Since the late 1800s, the primary guiding principle of the recreation movement has been to promote the welfare of individuals through participation in wholesome recreation activities. The National Recreation and Park Association (NRPA) acquired the rights to use the slogan “Life. Be in it” from Australian Limited, a nonprofit health and fitness organization, and used the slogan from 1978 through 1985 to encourage participation in active lifestyles (Bill Beckner, NRPA Research Manager, personal communication, 14 December 2009). The NRPA also works to promote environmental awareness, community wellness, cultural understanding, and self-empowerment.

Leisure, however, has become a casualty of prosperity as many citizens of industrialized nations, and Americans in particular, are caught up in a culture of materialism and consumerism. Instead of offering time off for a job well done, employers often offer more money (bonuses), which can be used to acquire yet more material possessions. A work ethic guided by the nobility of work, social recognition via promotions at work, and displays of wealth by conspicuous consumption is reinforced by

more work and more consumption. The leisure ethic of seeking free-time experiences that include high-quality environmental settings, cultural enhancement, and self-enrichment is relegated to secondary status. Shor (1991) advocated adopting a non-consumptive mentality—that is, doing with less.

DeGraaf and colleagues (2005) state that American society is infected with a socially accepted virus called “affluenza,” defined as “a painful, contagious, socially transmitted condition of overload, debt, anxiety, and waste resulting from the dogged pursuit of more” (p. 2). The authors go on to say that affluenza is a bloated, sluggish, and unfulfilled feeling that results from efforts to keep up with the Joneses; it is an epidemic of stress, overwork, waste, and indebtedness caused by the pursuit of the American Dream, an unsustainable addiction to economic growth.

The term was popularized in the United States in 1997 by the television documentary titled, “Affluenza: The All-Consuming Epidemic,” produced by John DeGraaf and broadcast by KTCS and Oregon Public Broadcasting. The analysis includes such questions as, “What choices did we make as a society (between free time and ‘stuff,’ for example) that deepened our infection?” (DeGraaf et al. 2005, p.5). To cope with the epidemic, the authors encourage a “new frugality and voluntary simplicity” (DeGraaf et al. 2005, p. 6) or doing with less—that is, choosing time instead of more money. The authors state that shopping has become a national pastime; 93 percent of teenage American girls state that shopping is their favorite recreation activity (DeGraaf et al. 2005, p. 15). Shopping at malls is accompanied by shopping by catalog, by TV, or online, usually with one of 6.5 credit cards, the average number of credit cards owned by Americans (DeGraaf et al. 2005, p. 19). The result of this consumption frenzy is material overload, debt, a shortage of time for nurturing human relationships (a harried leisure class), a lengthening work schedule, stress from overload and anxiety, lack of sleep, obesity, depression, a decrease in social capital that binds

communities together, and a decline in public investment in public spaces as parks.

The newest target of spreading affluenza is children, who are bombarded with commercials and then either make their own purchases or influence their parents' purchases. "The more Americans fill their lives with things, the more they tell psychiatrists, pastors, friends, and family members that they feel 'empty' inside. The more toys our kids have to play with, the more they complain of boredom" (DeGraaf et al. 2005, p. 74). The lack of connectiveness with others in the community, absence of community service, and disconnect from environmental issues, coupled with standardized work and materialism, provide little opportunity for finding meaning, creativity, and association. The authors assert that vitality results from service to others, relationships with friends and family, connections with nature, and work of intrinsic moral value, for example, rejuvenating an historic building, removing pollutants from a stream, or saving wildlife habitat (DeGraaf et al. 2005, p. 82).

1.1 Leisure Resourcefulness

Leisure resourcefulness is a term used by the Rapoport (1975) to describe a person's ability to make a meaningful life for him/herself within the realities of his/her own existence. Leisure resources include knowledge of leisure, time, space, skill, companions, equipment, money, and one's attitude toward leisure. Each person must develop these resources over time, and bring them, in varying combinations, into activity spheres to satisfy one's preoccupations or mental absorptions at each life-cycle stage. As individuals' needs change at different life-cycle stages, changes also occur in lifestyle, adaptive abilities, personality, and environment. An individual who is highly resourceful is also highly adaptable to change and presumably also experiences higher life satisfaction as he/she is able to fulfill biological, physical, and mental needs at any point in time.

2.0 RESEARCH OBJECTIVE

Although there is a growing body of research in the area of lifestyles and consumerism, little research has been conducted on the relationship between consumerism and leisure. The objective of this research was to examine

lifestyles relative to aspirations for affluence and its relationship to life satisfaction and leisure resourcefulness.

2.1 Data Collection and Sample

Commuter students enrolled in university recreation courses collected the data. These students were residents of a large metropolitan area. Each student received five questionnaires with instructions to provide one questionnaire per household to a family member, friend, or acquaintance who was age 18 years or older. The sample size was 192 respondents.

The data collection instrument was a self-administered questionnaire. The title, "Life Style Orientation Study," was followed by a short paragraph asking the respondent to participate in the study, estimating the time it would take to complete the questionnaire, describing the purpose of the study, and offering a promise of confidentiality. The first page of the questionnaire contained the Affluenza Self-diagnostic Test, followed by the Life Satisfaction Scale and the Leisure Resourcefulness Scale. The instrument concluded with questions on the respondent's background and a note of thanks for participating in the study.

2.2 Research Scales

The Affluenza Self-diagnostic Test is a 50-item test designed to measure one's level of addiction to affluenza from De Graaf et al. (2005), pp. 174-176. Respondents provide a "yes" or "no" response to a variety of questions related to consumption and affluence (Table 1). The authors describe the test as an "unscientific, but we think useful, means of determining whether you've got affluenza..." (p. 174). This research used a modified 4-point Likert-type scale for assessing responses for the Affluenza Test: always, sometimes, seldom, never. Reliability test for the Affluenza Scale using Cronbach's alpha was .807.

The Life Satisfaction Index is a standardized scale consisting of 12 items that measures one's perception of his/her life at a point in time (Table 2).

Table 3 lists the scale items in the Leisure Resourcefulness Scale. This scale has five dimensions:

Table 1.—Affluenza self-diagnostic test***Scale Items**

- 1 Do you get bored unless you have something to consume (goods, food, media)?
- 2 Do you try to impress your friends with what you own, or where you vacation?
- 3 Do you ever use shopping as “therapy”?
- 4 Do you sometimes go to the mall just to look around, with nothing specific to buy?
- 5 Do you buy home improvement products in a large chain store rather than the neighborhood hardware store?
- 6 Have you ever gone on a vacation primarily to shop?
- 7 In general, do you think about things more than you think about people?
- 8 When you pay utility bills, do you ignore the amount of resource consumed?
- 9 Given the choice between a slight pay raise and a shorter work week, would you choose the money?
- 10 Do you personally fill more than one large trash bag in a single week?
- 11 Have you ever lied to a family member about the amount you spent for a product?
- 12 Do you frequently argue with family members about money?
- 13 Do you volunteer your time less than 5 hours a week to help other people?
- 14 Do you routinely compare the appearance of your lawn and/or home with others in your neighborhood?
- 15 Do you routinely gamble or buy lottery tickets?
- 16 Do you check your investments at least once a day?
- 17 Are any of your credit cards “maxed out”?
- 18 Do worries about debt cause you physical symptoms like headaches or indigestion?
- 19 Do you spend more time shopping every week than you do with your family?
- 20 Do you frequently think about changing jobs?
- 21 Have you had cosmetic surgery to improve your appearance?
- 22 Do your conversations often gravitate toward things you want to buy?
- 23 Are you sometimes ashamed about how much money you spend on fast food?
- 24 Do you sometimes weave back and forth in traffic to get somewhere faster?
- 25 Have you ever experienced road rage?
- 26 Do you feel like you’re always in a hurry?
- 27 Do you often throw away recyclable materials rather than take the time to recycle them?
- 28 Do you spend less than an hour a day outside?
- 29 Can you identify more than three wildflowers that are native to your area?
- 30 Do you replace sports equipment before it’s worn out to have the latest styles?
- 31 Does each member of your family have his or her own TV?
- 32 Is the price of a product more important to you than how well it was made?
- 33 Has one of your credit cards ever been rejected by a salesperson because you were over the limit?
- 34 Do you receive more than five mail-order catalogs a week?
- 35 Are you one of those consumers who almost never take a reusable bag to the grocery store?
- 36 Do you ignore the miles per gallon of gasoline your car gets?
- 37 Did you choose the most recent car you bought partly because it enhanced your self-image?
- 38 Do you have more than five active credit cards?
- 39 When you get a raise at work, do you immediately think about how you can spend it?
- 40 Do you drink more soft drink, by volume, than tap water?
- 41 Did you work more this year than last year?
- 42 Do you have doubts that you’ll be able to reach your financial goals?
- 43 Do you feel “used-up” at the end of your workday?
- 44 Do you usually make just the minimum payment on credit card bills?
- 45 When you shop, do you often feel a rush of euphoria followed by anxiety?
- 46 Do you sometimes feel like your personal expenses are so demanding that you can’t afford public expenses like schools, parks, and transit?
- 47 Do you have more stuff than you can store in your house?
- 48 Do you watch TV more than 2 hours a day?
- 49 Do you eat meat nearly every day?

Each item was measured on a 4-point scale: 1=Always, 2=Sometimes, 3= Seldom, 4=Never.

Item #15 in the original scale was omitted in this research due to a clerical error: “Does each person in your house or apartment occupy more than 500 square feet of personal space?”

Item #21 was changed from “Have you had cosmetic surgery to improve your appearance?” to “Do you think about cosmetic surgery to improve your appearance?” to accommodate the change in scale responses from a 2- to a 4- point scale.

*Scale used with permission of Berrett-Koehler Publishers, San Francisco.

Table 2.—Life satisfaction scale items and reliability score

1	As I grow older, things seem better than I thought.
2	I have gotten more of the breaks in life than most.
3	I am just as happy as when I was younger.
4	These are the best years of my life.
5	*Most of the things I do are boring.
6	I expect some pleasant things to happen to me.
7	The things I do are as interesting to me as they ever were.
8	*I feel old and somewhat tired.
9	As I look back on life, I am fairly well satisfied.
10	I have made plans for things I'll be doing a month from now.
11	*When I think back over my life, I didn't get most of the important things I wanted.
12	*Compared to other people, I get down in the dumps too often.

Cronbach's alpha=.803

Adapted from Havinghurst et al. 1961.

Scale items were measured on a five point scale: 1 = Strongly Agree, 2 = Agree, 3 = Neither Agree nor Disagree, 4 = Disagree, 5 = Strongly Disagree.

*Items were reverse coded for internal consistency.

Table 3.—Leisure resourcefulness scales and scale items**Leisure Attitude**

Leisure is a necessary part of my life.

I know why leisure is important to me.

Leisure Companions

I have friends to do most anything I want to do in leisure.

My friends know a lot of leisure activities.

Leisure Equipment

I know how to use my leisure equipment.

I know where to purchase equipment I need.

Leisure Knowledge

I have taught this activity to others.

I know leisure opportunities when I see them.

I know places to go for leisure.

Leisure Time

Leisure time is for enjoyment.

Leisure time is doing things I like to do.

I value my free time.

Scale items are measured from 1 = Strongly Agree to 5 = Strongly Disagree.

leisure attitude, leisure companions, leisure equipment, leisure knowledge, and leisure time. The original 10 items in each scale were reduced to a two- or three-item scale by factor analysis (Ricciardo 2004).

RESULTS

3.1 Description of the Sample Population

Forty-five percent of the respondents were male. Eighty-three percent were Caucasian and 7 percent were African American. Respondents' ages ranged from 17 to 62 with an average age of 34.5. Forty-four percent were married and 47 percent were single. Thirty-eight percent

had graduated from high school or a technical school, or had completed some college. Fifty-nine percent had graduated from college, attended graduate school, or had an advanced degree. The annual household income of 68 percent of the sample was less than \$50,000, 18 percent earned between \$50,000 and \$90,000, and 13 percent had gross incomes above \$90,000. The occupations of 33 percent of the sample were professional/technical, 21 percent were managers/officials/proprietors, 11 percent were in sales/clerical work, and the remainder (35 percent) were craftspeople, machinery operators, students, laborers, or service workers. Ninety-two percent

reported their health as excellent or good. Seventy percent of the respondents reported living at their current address less than 6 years. Sixty-six percent lived alone or with their spouse. The remainder of the respondents lived with friends, parents, or other family members. Ninety-one percent resided in southeast Michigan communities.

3.2 Findings

Regression analysis identified one Leisure Resourcefulness variable that was significantly associated with affluenza: leisure attitude (Table 4). The beta weight for leisure attitude is negative—as leisure attitude increases, level of affluence decreases. The level of explained variance is low at 9 percent. Table 5 shows two Leisure Resourcefulness variables that serve as significant predictors of life satisfaction: leisure companions and leisure knowledge. The explained variance is 32 percent.

4.0 CONCLUSIONS

The data show that a favorable leisure attitude was negatively associated with affluenza as a lifestyle orientation. The choice to consume is pervasive in U.S. culture. Advertisements continually encourage us to consume to improve our sense of well-being and our self-image. Product imaging, targeting, promotion, packaging, labeling, and pricing overwhelm individual resolutions not to consume. Shopping is among the top 10 recreation activities on a weekly basis in the U.S. (Cheek and Burch 1976). It is a structured social activity consisting of imaging and need creation accompanied by a frenzy of choices, labels, patterns, colors, sizes, self-imaging, and feedback to satisfy preconceived needs. Shopping consumes a significant amount of individual/group resources in planning, preparation, on-site behaviors, decision-making processes, monetary resources, time, physical and mental demands, and reflection, which results in euphoric highs and lows. Shoppers become “shopped out” only to recover and display their wares and their expertise in decision-making in pursuing the “best deals.” Leisure attitudes can influence behavior to adopt a leisure ethic versus an ethic of consumption and affluence. A leisure ethic is centered on quality of the environment, cultural enhancement, and self-enrichment through involvement in free-time experiences. To reclaim leisure, Schor (1991) states that

Table 4.—Results of multiple regression analysis of the affluenza self-diagnostic test and the leisure resourcefulness scale

Leisure Resourcefulness Scales	Average scores	Beta	t	Sign.
Leisure Attitude	1.86	-.207	-2.17	.031
Leisure Companions	2.25	.125	1.53	.127
Leisure Equipment	2.00	.001	.01	.987
Leisure Time	1.55	-.173	-1.76	.079
Leisure Knowledge	1.89	.163	1.89	.060

Model Summary

R = .309 R² = .095 F(5,186) = 3.92, p<.002

Scores for the dependent variable, Affluenza, were added for the 49-item scale for each respondent for the responses “Always” and “Never”. Responses for “Sometimes” and “Seldom” were ignored. Scale values are: 1 = Always, 2 = Sometimes, 3 = Seldom, 4 = Never.

Scores for the independent variable Leisure Resourcefulness were summed and averaged for each respondent for each Leisure Resourcefulness Scale. Scale values are: 1 = Strongly Agree, 2 = Agree, 3 = Neither Agree nor Disagree, 4 = Disagree, 5 = Strongly Disagree.

Table 5.—Results of multiple regression analysis of life satisfaction and the leisure resourcefulness scale

Leisure Resourcefulness Scales	Average scores	Beta	t	Sign.
Leisure Attitude	1.86	.061	0.71	.474
Leisure Companions	2.25	.235	3.25	.001
Leisure Equipment	2.00	.095	1.22	.222
Leisure Time	1.55	.055	0.63	.528
Leisure Knowledge	1.89	.337	3.85	.001

Model Summary

R = .567 R² = .32 F(5,176) = 16.6, p < .001

Scores for the dependent variable Life Satisfaction were summed and averaged for each respondent. Scale values are: 1 = Strongly Agree, 2 = Agree, 3 = Neither Agree nor Disagree, 4 = Disagree, 5 = Strongly Disagree.

Scores for the independent variable Leisure Resourcefulness were summed and averaged for each respondent for each Leisure Resourcefulness Scale. Scale values are: 1 = Strongly Agree, 2 = Agree, 3 = Neither Agree nor Disagree, 4 = Disagree, 5 = Strongly Disagree.

Americans must adopt a nonconsumptive mentality—that is, doing with less.

In this research, life satisfaction was related to leisure companions and leisure knowledge. The social group is the major building block for social organization. Forming

bonds within a social group is a mechanism for cohesion and survival in diversified social systems, and such bonds often last a lifetime. There is safety and security in a social group of individuals that share symbols, permeable social boundaries, tastes, a social order, accepted norms, and established patterns of behavior, which ultimately provide a means to achieve life satisfaction (Cheek and Burch 1976).

Leisure resourcefulness is knowing how to—and being able to—make a meaningful life for oneself within the realities of one's own existence. In this research, leisure knowledge was a significant predictor of life satisfaction. Knowledge influences many aspects of empowerment in human behavior, including, for example, one's adaptive environment, social organization, social and cultural milieu, and choices to satisfy physical, mental, and biological needs at a point in time along the life-cycle continuum.

These research findings challenge leisure educators to develop basic leisure and recreation courses as elective courses, if not required general education courses for graduation requirements. Leisure service providers are also challenged to emphasize education for leisure as an extension of normal recreation activity and/or interpretive offerings.

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The content of this paper reflects the views of the authors(s), who are responsible for the facts and accuracy of the information presented herein.

*TOURISM—MOTIVES AND
MANAGEMENT*

“I JUST WANTED TO GET AWAY”: AN ANALYSIS OF SPRING BREAKERS’ TRAVEL MOTIVATIONS

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Abstract.—Scholarly research on Spring Break has grown substantially and has often associated spring breakers’ motivations with a number of risky behaviors. Recent research, however, has challenged these assumptions. The purpose of this study was to examine spring breakers’ motivations for going on Spring Break. Unlike the media portrayal of Spring Break as a time of excess and risky behaviors, results showed that participants went on Spring Break primarily to “get away” from school and associated responsibilities. Other motivations included the search for rest and relaxation, spending time with friends and family, experiencing Spring Break for the first time, and simple necessity. Implications for existing leisure theory and future motivational research are discussed.

1.0 INTRODUCTION

Spring Break—a contemporary North American phenomenon that includes the voluntary migration of thousands of college students toward warm weather and vacation during the early spring—has been the subject of much scholarly work (Ribeiro and Yarnal 2008). Analysis of the Spring Break literature reveals that motives for going on a Spring Break vacation have remained remarkably consistent through the years. The primary reasons for going on a Spring Break vacation are: to escape from school and school-related responsibilities (Gerlach 1989); to experience warmer climates (Josiam et al. 1999); for adventure (Apostolopoulos et al. 2002); to seek fun and enjoyment (Klenosky 2002); and, to a lesser

extent, to explore opportunities for drinking, sex, and drug-taking (Sönmez et al. 2006). Many spring breakers travel to be with their friends and/or family (Josiam et al. 1994, Josiam et al. 1998), and a small percentage also travel because going on Spring Break is “the thing to do” (Josiam et al. 1999).

In spite of this evidence, Spring Break vacation motivations are typically linked to participating in risky behaviors. The common portrayal by scholars, and the media is the college student going on Spring Break primarily to drink alcohol in large quantities; engage in frequent, casual, and unprotected sex; and behave in a raunchy and unruly manner (e.g., Apostolopoulos et al. 2002). Despite this traditional view, discrepancies in the literature exist, and scholars disagree about the reasons for Spring Break travel (cf. Mattil, 2001, Sönmez et al. 2006, Ribeiro and Yarnal 2008). We may hypothesize that such a fragmented view of Spring Break is the reason some scholars have posited that there is a direct relationship between motivations to go on Spring Break and Spring Break behavior(s) (Maticka-Tyndale et al. 1998, Sönmez et al. 2006). Consequently, many scholars, along with the majority of the media, maintain that the reasons undergraduate students go on Spring Break is primarily to engage in the aforementioned risky behaviors. Missing from the literature are studies that allow spring breakers to describe their Spring Break experiences, their primary motivations for going on Spring Break, and how such motivations relate to their actual Spring Break behavior. Therefore, the purpose of this study was to examine spring breakers’ travel motivations in their own words, and to portray the Spring Break experience as viewed by those that participate in it.

2.0 METHODS

Face-to-face, semi-structured interviews (Bernard 2002) were conducted pre- and post-Spring Break with 14 undergraduate students (eight females, six males; mean age 19) from a large mid-Atlantic university in 2007. The participants were selected via convenience sampling (Miles and Huberman 1994). Interviews were

Table 1.—Participants' Spring Break motivations (push factors)

Name ¹	Age	Reasons for going on Spring Break
Anna	18	"It was something to do with myself"
Donna	19	"My friends and I just put the plans together"
Jennifer	18	"To have fun and get away to Florida"
John	18	"To get away from everything"
Karen	19	"I think there was opportunity"
Lisa	18	"I had to leave"
Mary	18	"Just go out and have fun with my friends"
Michelle	18	"Because I wanted to see my boyfriend"
Mike	21	"Just the atmosphere"
Robert	18	"I just wanted to get away from dreary (...) for a little while"
Scott	21	"I just wanted to see what Spring Break was like"
Sean	18	"Relax for a week, not have to worry about anything"
Sharon	19	"I really wanted to see my family"
William	25	"Because I'd never been on a cruise before"

¹All names have been changed to protect participants' identities and to ensure confidentiality.

digitally recorded, transcribed verbatim, and analyzed by four independent researchers with the aid of the qualitative analysis software program NVivo® 7.0 (QSR International Pty Ltd., Doncaster, Australia). Distinct procedures were used to increase the internal validity of the findings, including triangulation, peer review, negative case analysis, clarifying researcher bias, and thick description (Miles and Huberman 1994, Creswell 1998). Consistent with existing literature (Guest et al. 2006), data saturation was reached by the eighth set of interviews.

3.0 RESULTS AND DISCUSSION

A wide variety of Spring Break experiences were reported; rest and relaxation was the norm, and only one participant had a Spring Break experience that focused on partying. Participants in this study went on Spring Break to get away, to be with friends and/or family, because they were curious about Spring Break, to escape boredom, to try something new, or because they had no other option but to go on Spring Break. A summary of participants' reasons for going away on Spring Break can be found in Table 1.

The main reason cited by participants for going on Spring Break was simply *to get away*. All participants mentioned "getting away" or "escape" as motivations for

their Spring Break trips. Furthermore, the participants' Spring Break vacations seldom corresponded to the stereotype of excessive behaviors. Instead, participants' descriptions of their Spring Break vacations varied greatly. As one participant put it: Spring Break is:

... a way to get away and relax from all the work of college. Not really as one big, huge party, like I saw before(...) I'd say the biggest thing is it's really what you want to make it, I guess. If you want to go out and party and have a good time you have every opportunity to do that. Just as if you just want to mosey around or relax, you can do that, too. (Sean, 18)

But what were participants escaping from? They were basically escaping routine, responsibilities, boredom, schoolwork, parents, cold weather, stress, social norms, and reality. One participant summarized it best when he said:

I think the main reason [to go on Spring Break] is to get away from everything... It was like, basically, it was really nice and relaxing just to get away, away from everything. Away from [what], I don't even know. Everything, basically. (John, 18)

The importance of “getting away” as a motivational factor has long been recognized in the travel and tourism literature (Krippendorf 1987, Carr 2002). In the seminal work *The Holidaymakers* (1987), Jost Krippendorf pointed out that “getting away” is the cornerstone of travel behavior: “Travel is motivated by ‘going away’ rather than ‘going towards’ something or somebody. To shake off the everyday situation is much more important than the interest in visiting new places and people” (p. 29). In the case of Spring Break, however, it is interesting to note that despite some evidence in the literature of “getting away” as a primary motivational factor (Josiam et al. 1994; Maticka-Tyndale and Herold 1997, 1999), its importance has either been downplayed by researchers or irrevocably associated with extreme types of behavior such as binge drinking and casual sex. Based on the findings of this study, no such relationship between motivation and extreme behavior could be established. It is hypothesized that these are two distinct processes in the case of Spring Break, and that no direct relationship can be established between them.

The second most common reason that propelled participants to go on Spring Break, *visiting friends and/or family*, stemmed from more than just a genuine emotional concern about loved ones. On one hand, participants felt guilty about neglecting their family and friends, and Spring Break presented itself as the perfect opportunity to visit them. Additionally, participants’ families may have exerted some pressure, which only exacerbated spring breakers’ feelings of guilt: “It is hard when I see that they care a lot and they kind of push you to come home” (Sharon, 19). On the other hand, there may have been a more prosaic reason behind these participants’ decision to spend Spring Break with their families and/or friends. Consonant with previous literature (Josiam et al. 1994, 1998), money was a determinant in the participants’ Spring Break experiences. Money affected spring breakers’ choices of destination, transportation, and activities while on Spring Break, and its importance should not be underestimated: “Money is a huge factor” during Spring Break” (William, 25). It is quite possible that, faced with insufficient funds to go on a Spring Break trip of their choice, some participants simply chose to go home.

The third most commonly mentioned reason that participants went on Spring Break (*something to do/opportunity/curiosity*) is closely tied to their individual personalities and attitudes towards Spring Break. Similar to what occurs during other college vacation periods (e.g., Christmas, summer), for some participants, personal preferences dictated their type of Spring Break trip, resulting in a number of different experiences. For Scott (21), it was above all else “a curiosity thing.” For Anna (18) and Donna (19), however, it was just “something to do.” Finally, for William (25), going on Spring Break allowed him to go on a cruise, which he had never done before. These responses represent a breakthrough for the Spring Break literature, which until now has failed to recognize the motivational importance of factors such as curiosity, opportunity, and interest, or a combination of these and other factors. In this regard, it should be reiterated that all of the aforementioned participants mentioned “getting away” as an additional reason to go on Spring Break.

Finally, some participants simply felt that going on Spring Break was “the thing to do” (Karen, 19). Particularly for those participants who live on campus in university-provided (dorms), the implications of their place of residence during Spring Break should be considered. First, students are not allowed to stay in dorms during Spring Break; they must find alternative accommodations on campus (usually quite difficult), go home, or go on Spring Break. Thus, students are almost “forced” to go on Spring Break, or at least to go away from school. Second, living in dorms provides a peculiar atmosphere, which is peppered with excitement during the weeks that precede Spring Break. Students were eager to get away from the cold, school, work, and the small confines of their dorm rooms: “We were just excited to go, excited to get away” (Michelle, 18). Therefore, it is possible that for a minority of spring breakers, these “structural constraints” (Crawford et al. 1991) have conditioned their decision to go on Spring Break. Partial support for this hypothesis can be found in the Josiam et al. (1994) study, in which the percentage of college students that mentioned Spring Break as “the thing to do” was approximately 5 percent (p. 325).

Previous Spring Break studies have focused mainly on spring breakers' behavior, paying little attention to their motivations for going on Spring Break (Maticka-Tyndale et al. 1998, Smeaton et al. 1998). Nevertheless, almost 15 years ago, Josiam et al. (1994) found that the four primary travel motivations (push factors—see Crompton 1979) of spring breakers were: “to get away” (45 percent), “to visit family” (13 percent), “sun, surf, sand” (12 percent), and the “need to relax” (10 percent). More recent research, however, has almost unanimously equated spring breakers' (extreme) behavior with their reasons for going on a Spring Break vacation (Russell 2004, Sönmez et al. 2006). As noted above, the prevalent opinion among researchers and the popular media is that college students go on Spring Break primarily to engage in binge drinking, drug-taking, and casual sex. Contrary to existing research (e.g., Gerlach 1989, Apostolopoulos et al. 2002), however, participants in this study did not go on Spring Break to engage in extreme types of behavior. Thus, the findings of the present study challenge previously held assumptions about Spring Break, and lend support to Josiam et al.'s (1994) findings.

4.0 LIMITATIONS

Because this study used a convenience sample, the findings apply to the participants in this study only, and further generalizations should be drawn with care. Nevertheless, it should be emphasized that the purpose of qualitative research is not to obtain generalizable results, but rather to provide deeper levels of meaning and suitable context, which are impossible to obtain otherwise. Furthermore, use of qualitative methods allowed participants to express their perspectives in their words, without being limited by extraneous assumptions.

5.0 CONCLUSION AND IMPLICATIONS FOR FUTURE RESEARCH

The findings of this study resonate with what is known about travel motivations in general (Cohen 1996) and the travel motivations of college students in particular (Kim et al. 2007). Most researchers concur that the desire to escape something, rather than going in search of something else, is at the root of travel and tourism (Krippendorff 1987). The present findings corroborate that claim, and add to the framework of push-pull travel motives (Dann 1979), lending support to the work of

previous scholars on Spring Break motivations (Klenosky 2002). Furthermore, due to the complexity of the travel decision-making process, one motivation may be dominant (e.g., “getting away”), but all other motives (e.g., friends and family, relaxation) must be considered as well; motivation is a multidimensional construct (Pyo et al. 1989). Finally, findings from this study suggest that researchers and practitioners alike should adopt a more holistic and multidimensional perspective in the study of complex phenomena such as Spring Break, and to the study of travel motivations in general.

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