

## Table of Contents

<b>Keynote Address.....</b>	1
Making research more relevant: Give it a try! <i>David W. Lime.....</i>	3
<b>Crowding Issues in Resource Management.....</b>	13
Balancing tradeoffs in the Denali Wilderness: An expanded approach to normative research using stated choice analysis. <i>Steven R. Lawson and Robert Manning.....</i>	15
Coping, crowding and satisfaction: A study of Adirondack wilderness hikers. <i>Andrew K. Johnson and Chad Dawson.....</i>	25
Perceived crowding at Boston Harbor Islands National Park Area. <i>Megha Budruk, Robert E. Manning, William A. Valliere, and Benjamin Wang.....</i>	32
Transportation planning and social carrying capacity in the National Parks. <i>William Valliere, Robert Manning, Megha Budruk, Steven Lawson, and Benjamin Wang.....</i>	36
<b>The Role of Information in Travel Planning Decisions.....</b>	41
Assessing information needs and communication behaviors of National Forest summer visitors. <i>James D. Absher, Brijesh Thapa, and Alan R. Graefe.....</i>	43
The commodification process of extreme sports: The diffusion of the X-Games by ESPN. <i>Chang Huh, Byoung Kwan Lee, and Euidong Yoo.....</i>	49
Marketing National Parks: Oxymoron or opportunity? <i>Alan K. Hogenauer.....</i>	53
<b>Demographic Trends in Outdoor Recreation Participation &amp; Travel.....</b>	61
Wildlife-associated recreation in the North Central Region: Participation patterns and management implications. <i>Allan Marsinko and John Dwyer.....</i>	63
The New England travel market: Generational travel patterns, 1979 to 1996. <i>Rod Warnick.....</i>	69
Welcome center research: How valuable is secondary research? <i>Lousia Meyer, Tara Patterson, Lori Pennington-Gray, Andrew Holdnak, and Brijesh Thapa.....</i>	76
<b>Methodology in Outdoor Recreation Research I: Interventions.....</b>	79
Unique programming: An examination of the benefits of a free choice program. <i>Dorothy L. Schmalz, Deborah L. Kerstetter, and Harry C. Zinn.....</i>	81
Outdoor experiential-based training: Motivational and environmental influences affecting outcomes. <i>Teresa (Birdie) High and Alan R. Graefe.....</i>	85
Use of experience sampling method to understand the wilderness experience. <i>Lynn Anderson.....</i>	92
Encounters and the guided group trip: Going "on-the-scene" to examine the situational interpretation of encounters. <i>Erin K. Sharpe.....</i>	98

<b>Leisure Motivations of Outdoor Recreationists.....</b>	<b>105</b>
Differences in SCUBA diver motivations based on level of development. <i>Sharon L. Todd, Alan R. Graefe, and Walter Mann.....</i>	107
Skier motivations: Do they change over time? <i>Erin White and Lori Pennington-Gray.....</i>	115
Sociocultural perspectives of trapping revisited: A comparative analysis of activities and motives 1994 and 2000. <i>Rodney R. Zwick, Ron Glass, Kim Royar, and Tom Decker.....</i>	118
<b>Resource Management &amp; International Tourism Development.....</b>	<b>125</b>
The impact of potential political security level on international tourism. <i>Young-Rae Kim, Chang Huh, and Seung Hyun Kim.....</i>	127
Future of the Korea National Parks: A preliminary Delphi study of key experts. <i>Byung-kyu Lee and Wilbur F. LaPage.....</i>	130
<b>User Satisfaction in Outdoor Recreation.....</b>	<b>133</b>
A preliminary analysis of Florida State Park satisfaction survey data. <i>Andrew Holdnak, Stephen Holland, and Erin Parks.....</i>	135
Recreationists in the Columbia River Gorge National Scenic Area: A survey of user characteristics, behaviors, and attitudes. <i>Robert C. Burns and Alan R. Graefe.....</i>	138
Visitor satisfactions: Backcountry and wilderness users in the White Mountain National Forest. <i>Chad P. Dawson, Rebecca Oreskes, Frederick Kacprzyński, and Tom More.....</i>	144
Participants' perceptions of the 1997-1998 Missouri State Parks Passport Program. <i>Yi-Jin Ye and Jaclyn Card.....</i>	153
<b>Environmental Knowledge, Concern, Behavior &amp; Education.....</b>	<b>161</b>
An evaluation of Appalachian Trail hikers' knowledge of minimum impact skills and practices. <i>Peter Newman, Robert Manning, Jim Bacon, Alan Graefe, and Gerard Kyle.....</i>	163
Who cares and who acts? Different types of outdoor recreationists exhibit different levels of environmental concern and behavior. <i>Mario F. Teisl and Kelly O'Brien.....</i>	168
Visitor behavior and resource impacts at Cadillac Mountain, Acadia National Park. <i>Rex Turner and Wilbur LaPage.....</i>	175
<b>Leisure Constraints of Outdoor Recreationists.....</b>	<b>181</b>
The effects of perceived leisure constraints among Korean university students. <i>Sae-Sook Oh, Sei-Yi Oh, and Linda L. Caldwell.....</i>	183
Exploration of the influence of self-efficacy on recreation participation levels of individuals with visual impairments who use dog guides. <i>Laurlyn K. Harmon and Linda L. Caldwell.....</i>	188
<b>Urban Recreation &amp; Development Issues.....</b>	<b>193</b>
An integrative concept for visitor monitoring in a heavily used conservation area in the vicinity of a large city: The Danube Floodplains National Park, Vienna. <i>Arne Arnberger, Christiane Brandenburg, and Andreas Muhar.....</i>	195

Linkages in the use of recreation environments across the urban to ex-urban spectrum by urban residents. <i>John F. Dwyer and Susan C. Barro</i> .....	202
The role, use and benefits of natural recreation areas within and near residential subdivisions. <i>Christine A. Vogt and Robert W. Marans</i> .....	208
<b>Economic Impacts &amp; Non-economic Benefits of Tourism</b> .....	215
New York State's 1999 agritourism business study. <i>Diane Kuehn and Duncan Hilchey</i> .....	217
Rail-trails and special events: Community and economic benefits. <i>Charles Nelson, Christine Vogt, Joel Lynch, and Daniel Stynes</i> .....	220
Private business perceptions of transportation issues and the Island Explorer Bus system at Acadia National Park, Maine. <i>Rea Brennan, Marc Edwards, and John J. Daigle</i> .....	225
<b>Management Decision-making &amp; Planning for Outdoor Recreation</b> .....	231
Integrating resource, social and managerial indicators of quality into carrying capacity decision making. <i>Peter Newman, Robert Manning, and Bill Valliere</i> .....	233
Redefining roles of science in planning and management: Ecology as a planning and management tool. <i>Greg Mason and Stephen Murphy</i> .....	239
<b>Impacts of Wildlife Viewing</b> .....	247
Elk viewing in Pennsylvania: An evolving eco-tourism system. <i>Bruce E. Lord, Charles H. Strauss, and Michael J. Powell</i> .....	249
Competing values: A case study of Pennsylvania's elk herd as a tourism attraction. <i>Jeffrey A. Walsh and Leonard K. Long</i> .....	253
Impacts of wildlife viewing at Dixville Notch Wildlife Viewing Area. <i>Judith K. Silverberg, Peter J. Pekins, and Robert A. Robertson</i> .....	260
<b>Methodology in Outdoor Recreation Research II: Instruments &amp; Methods</b> .....	267
Effects of pretesting with the adventure recreation model instrument. <i>Anderson Young, Lynn Anderson, and Dale Anderson</i> .....	269
Modeling nonlinear preferences. <i>Donald F. Dennis</i> .....	275
<b>Personal Relevance, Involvement &amp; Loyalty in Outdoor Recreation</b> .....	279
Psychological commitment as a mediator of the relationship between involvement and loyalty. <i>Joohyun Lee and Alan Graefe</i> .....	281
<b>Gender Issues in Outdoor Recreation &amp; Resource Management</b> .....	289
Older Chinese women immigrants and their leisure experiences: Before and after emigration to the United States. <i>Ching-Hua Ho and Jaclyn A. Card</i> .....	291
Towards an understanding of gender differences with respect to whitewater rafting preferences. <i>Duarte B. Morais, Traci Zillifro, and Susanne Dubrouillet</i> .....	298

<b>Trails over Land &amp; Water: Issues of Multiple Use &amp; Conflict</b> .....	305
Use and user patterns among Michigan licensed Off-Highway Vehicles ownership types. <i>Joel A. Lynch and Charles M. Nelson</i> .....	307
Recreation conflict of riparian landowners with personal watercraft and motorboat use along the New York's Great Lakes. <i>Cheng-Ping Wang and Chad P. Dawson</i> .....	314
User preferences for social conditions on the St. Croix International Waterway. <i>Jamie Hannon, John J. Daigle, and Cynthia Stacey</i> .....	320
Security along the Appalachian Trail. <i>James J. Bacon, Robert E. Manning, Alan R. Graefe, Gerard Kyle, Robert D. Lee, Robert C. Burns, Rita Hennessy, and Robert Gray</i> .....	326
Trails research: Where do we go from here? <i>Michael A. Schuett and Patricia Seiser</i> .....	333
<b>Attachments to Places &amp; Activities in Outdoor Recreation</b> .....	337
Visitor meanings of place: Using computer content analysis to examine visitor meanings at three National Capitol sites. <i>Wei-Li Jasmine Chen, Chad L. Pierskalla, Theresa L. Goldman, and David L. Larsen</i> .....	339
The importance of visitors' knowledge of the cultural and natural history of the Adirondacks in influencing sense of place in the High Peaks Region. <i>Laura Fredrickson</i> .....	346
Attachments to places and activities: The relationship of psychological constructs to customer satisfaction attributes. <i>Thomas D. Wickham and Alan R. Graefe</i> .....	356
An exploration of human territoriality in forest recreation. <i>Harry C. Zinn, Laurlyn K. Harmon, Brijesh Thapa, Deborah L. Kerstetter, and Alan R. Graefe</i> .....	365
Community attachment and resource harvesting in rural Denmark. <i>Rodney R. Zwick and David Solan</i> .....	369
<b>Poster Session</b> .....	375
The political economy of wilderness designation in Nova Scotia. <i>Glyn Bissix, Leah Levac, and Peter Horvath</i> .....	377
The Westfield River Watershed Interactive Atlas: Mapping recreation data on the Web. <i>Robert S. Bristow and Steven Riberdy</i> .....	383
Park resources as an essential to urban societies. <i>Kristin Dion, Doug Stefancik, Serena Hawkins, and Robert Bristow</i> .....	386
Parks and recreation employment status: Implications from a civil service perspective. <i>Joel Frater and Arthur Graham</i> .....	390
Natural resources interpretation: The role of researchers – A new-old approach. <i>Mark Gleason</i> .....	395
Mountain bike trail compaction relation to selected physical parameters. <i>Jeff Hale and Rodney R. Zwick</i> .....	399
Internet & branding: A perfect match or a fatal attraction? Analysis of fifty states of the U.S. official tourism websites. <i>Gyehee Lee, Liping A. Cai, Everette Mills, and Joseph T. O'Leary</i> .....	403

Job satisfaction among recreation practitioners. <i>Erin Parks and Andrew Holdnak</i> .....	411
Extensivity and intensity of grants usage in obtaining funding for recreation services and capital improvement projects among park and recreation agencies in the state of Michigan. <i>Jerry L. Ricciardo</i> .....	415
Resident camp directors, spirituality, and wilderness. <i>Michael Rule and Edward Udd</i> .....	418
Social groups preferences relation to motivations and ability levels of whitewater kayakers. <i>Seth Turner and Rod Zwick</i> .....	421
<b>Management Presentation</b> .....	427
Human preferences for ecological units: Patterns of dispersed campsites within landtype associations on the Chippewa National Forest. <i>Lisa Whitcomb, Dennis Parker, Bob Carr, Paul Gobster, and Herb Schroeder</i> .....	429
<b>Roundtable Discussions</b> .....	435
Creating recreation partnerships on private agricultural and forest land in the urban Northeast: A case study from the Great Meadows of the Connecticut River. <i>Robert L. Ryan and Juliet Hansel</i> .....	437
Applied research opportunities in developed campgrounds. <i>Carl P. Wiedemann</i> .....	443
Adapting the Recreation Opportunity Spectrum (ROS) for states lands planning. <i>Susan Bulmer, Linda Henzel, Ann Mates, Matt Moore, and Thomas A. More</i> .....	447
It's time to put the C.A.R.T. before the H.O.R.S.E. or Putting Critical, Analytical, and Reflective Thinking before "Handyman" Oriented Recreation Student Education. <i>David L. Jewell</i> .....	452
<b>Index of Authors</b> .....	457

# **Trails over Land & Water: Issues of Multiple Use & Conflict**

## USE AND USER PATTERNS AMONG MICHIGAN LICENSED OFF-HIGHWAY VEHICLES OWNERSHIP TYPES

Joel A. Lynch, Ph.D.

Research Specialist, Department of Park, Recreation and Tourism Resources, 131 Natural Resources Bldg. Michigan State University, East Lansing, Michigan 48824-1222

Charles M. Nelson, Ph.D.

Associate Professor, Department of Park, Recreation and Tourism Resources, 131 Natural Resources Bldg. Michigan State University, East Lansing, Michigan 48824-1222

---

**Abstract:** Conventional off-highway vehicles (OHVs) range from small personal vehicles, such as motorcycles and all terrain vehicles to full-size passenger vehicles such as four-wheel drive trucks. The market and general recreational use of OHVs has changed markedly over the past thirty years. While many studies of OHV enthusiasts generalize to all OHV types, little research has drawn distinctions among different vehicle ownership segments. Consequently, in a 1998-99 study, Michigan OHV licensees were classified into seven ownership segments and differences among group members assessed. This research is presented and management implications of non-homogeneous users outlined.

---

### Introduction

As in many other states, off-highway vehicles (OHVs) in Michigan are defined as any wheeled motor vehicle capable of off-road travel (Michigan P.A. 319, 1975). This includes small lightweight single person vehicles, such as off-road motorcycles and three and four wheel all terrain vehicles (ATVs) and full-size four-wheel drive passenger vehicles such as trucks, jeeps, sport utility vehicles, and others specialty vehicles like dune buggies (hereafter characterized as SUVs). Snowmobiles are not considered OHVs in Michigan.

The recreational use of these OHVs can be divided into two broad categories pertaining to the basic function of the vehicle (Sheridan, 1979). In one category, the OHV, particularly motorcycles and specialty SUVs, such as dune buggies, is used primarily for recreational trail and scramble area riding. In the other category, mainly ATVs and SUVs such as four-wheel drive trucks, the vehicle is primarily for transportation supporting non-trail recreation and utilitarian pursuits. These include the support of hunting, ice fishing and camping as well as hauling, mowing, and plowing.

### Management Issues

Beginning with modified street motorcycles in the 1920s and converted military vehicles following World War II, OHVs grew in popularity during the 1960s and early 1970s (Hope, 1972). With their popularity came a number of

social and ecological consequences including concerns about noise, trespass and privacy and the amount and impact of soil erosion on surface waters and aquatic life (USDI, 1971; Sheridan, 1979). To contend with these circumstances, numerous states enacted legislation regulating and controlling OHV use, which subsequently led to the creation of OHV programs featuring users paying to develop and maintain trails and scramble opportunities (Belknap, 1988).

However, with the advent of the ATV in the mid-1970s, the OHV situation changed dramatically complicating management. The ATV was a versatile personal vehicle capable of traversing a greater variety of terrain than motorcycles and trucks, that could also transport a person and hundreds of pounds of gear into remote, non-roaded areas. With a treadway width of 50 inches needed for ATVs, many of the developed, designated trails designed for motorcycles in the 1960s and 70s, were too narrow with their 24-inch treadways. By the late 1980s, the ATV had emerged in Michigan as the most widely owned and used OHV (Nelson, 1989; Nelson, 1996). Today, the range of OHVs challenge managers by presenting a wide variety of vehicle widths and serving a myriad of purposes for their operators. Often these operators cross back and forth from public lands and frozen waters to private lands for a variety of recreational and work pursuits. ATVs, especially in areas with little sustained, deep snow cover, are operated year round.

The situation is further compounded because many OHV enthusiasts are complex with each having different motivations, attitudes, and interests depending on the type(s) of OHVs they own and operate (Peine, 1973). For instance, those who own motorcycles may be exclusively interested in designated public trail opportunities, whereas those who only own ATVs may be more interested in riding county road shoulders and cross country travel to reach preferred deer hunting locations. Others may own a variety of OHVs for both trail riding and utilitarian purposes.

Effective management necessitates a more complete understanding of the characteristics, needs and desires of different OHV segments. While many past studies generalized to the OHV user population, some have explored differences between various segments OHV segments. For example, Propst et al. (1977) compared users of motorcycles and four-wheel drive vehicles, identifying differences related to uses of the OHV. More recently, Crimmins (1999) in a 1998 mail survey of Colorado OHV users, found those who used their OHV for hunting or were members of an OHV club differed on opinions about funding priorities from OHV enthusiasts as a whole. While these studies are telling, no comparisons were found in the literature among the full range of OHV ownership segments. Consequently, in a 1998-99 mail study, Michigan OHV licensees were classified into seven ownership segments and differences among group members and management implications were assessed (Nelson et al., 2000).

## Study Background

Michigan's first OHV regulations were promulgated in 1976 with the passage of Michigan Public Act 319 of 1975, commonly referred to as the 'Off-Road Vehicle (ORV) Law.' Since then, the OHV program, administered by the Michigan Department of Natural Resources Forest Management Division (DNR-FMD) has continued to evolve (Nelson, 1996). Today, regulations restrict non-street licensed OHVs to designated trails and areas posted "open to OHVs" on the approximately 3 million acres of state and national forests in the Lower Peninsula. In the Upper Peninsula OHVs may use on any forest road or trail unless posted closed. Non-street licensed OHVs are banned from all but one of the 100 Michigan state parks and all of the state game and wildlife areas (Nelson, 1996). Private lands, with landowner permission, are open to OHV use throughout the state. Regulations also require the licensing of all resident and non-resident OHVs to operate on any public lands or frozen waters. Revenues from licensing are used for trail development, maintenance, law enforcement, environmental damage restoration, safety education and administration. In FY1999 these totaled about \$2 million. Presently, Michigan's designated OHV trail system totals 3,107 miles, with 40% maintained as 40 inch wide motorcycle trail, 43% as 50 inch wide ATV trail (open to cycle and ATV use) and 17% as 96 inch wide or wider OHV route (open to cycles, ATVs and SUVs) (Nelson, 1999). In addition, there are six major designated scramble areas, with the largest 2,500 acres.

## Study Methods

The data for this study was gathered using a mail questionnaire with a sample of Michigan 1998-99 OHV licensees (Nelson et al., 2000). The DNR License Control Division reported that in June 1999 there were 124,731 OHV licenses from the 1998-99 license year (April 1998 – March 1999). Of these, approximately 71,000 were in an electronic licensing system and another 2,500 were in the Michigan Cycle Conservation Club electronic database. The approximately 120 OHV dealers not in the electronic licensing system had sold the other 50,000 licenses. These dealers are not required to maintain records of purchaser names and addresses. Yet, based on input from DNR License Control, the Michigan Cycle Conservation Club Executive Director, and the State OHV Coordinator, it was determined that the electronic system list, in combination with the Cycle Conservation Club list, was likely to be representative of the total OHV licensee population.

To select a representative sample of OHV licensees, all duplicate names (cases where a person had more than one licensed OHV) were removed from both lists. Hence a person with one or five OHVs had the same chance of being sampled. This resulted in a total of 50,904 different OHV licensees from the 71,000 licenses in the electronic system that had one or more Michigan licensed OHVs in 1998-99. A similar procedure was used with the Cycle Conservation Club list resulting in 1,651 persons who had one or more Michigan licensed OHVs in 1998-99. From these two combined lists a systematic sample of every 10th OHV licensee was selected with a random start. Excluding

incomplete addresses, this resulted in a sample of 5,008 individuals.

The mail questionnaire was designed in cooperation with the DNR OHV Trail Coordinator and was reviewed by the Michigan OHV Trail Advisory Committee and the Michigan State University Committee on Research Involving Human Subjects. The 4-page questionnaire had 31 questions and elicited information on OHV ownership use, fuel consumption, spending, management preferences and demographics.

Multiple mailings of the questionnaire were used to encourage response. The initial mailing, sent in mid July 1999, included a questionnaire, explanatory cover letter and business reply envelope. The second mailing sent in early August 1999, used a follow-up reminder postcard. Finally, non-respondents were sent a third mailing of the questionnaire, revised cover letter and business reply envelope in late September 1999. Certified mail was used for the final mailing to emphasize the importance of the survey and to insure the address was correct for the licensee. Data was entered and analyzed using Statistical Package for the Social Sciences (SPSS).

## Results

Of the 5,008 addresses, 312 (6.2%) were invalid. Of the 4,696 valid addresses, 2,405 (51.2%) responded by returning a questionnaire. Of those, 115 (4.8%) no longer owned or used OHVs in Michigan. The remaining 2,290 completed the questionnaire and their responses are used in the analysis.

### Segmentation of OHV Licensees and OHV Use

Michigan OHV licensees were classified into seven ownership segments: motorcycle only, ATV only, SUV only, cycle/ATV, ATV/SUV, cycle/SUV, and cycle/ATV/SUV (Table 1). Altogether, ATV only licensees comprise over half of the OHV licensees, while ownership of all three OHV types accounted for the smallest percentage (3%) of license holders. Other segments with more than 10% of the licenses are motorcycle only and ATV/SUV. The motorcycle only and motorcycle/SUV segments were most likely to use the designated trail and route system, while ATV only segments were least likely to use them. Likewise, the motorcycle/SUV segment was most likely to report using at least one of the six designated scramble areas during July 1998 – June 1999, while ATV only respondents were least likely to visit these areas.

Less than a third of the OHV use in Michigan by licensed OHVs was public land riding (including the designated trail/area system) during a 12-month period in 1998-99 (Table 2). Motorcycles were most focused on public land riding, while half of ATV use was on private lands and more than a quarter was on public or private lands solely to support hunting or ice fishing. SUV riding was more common on public land than private, but over a third of the use was to support hunting or ice fishing on public or private lands.

**Table 1. OHV Ownership and Use of Designated Trails/Areas by 1998-99 Michigan OHV Licensees**

Ownership type	Licensee households	Percentage	
		Use designated trail system	Use designated scramble areas
Motorcycle only	12.5	87.7	45.0
ATV only	53.0	39.7	16.1
SUV only	7.9	65.9	51.4
ATV/SUV	13.4	47.5	29.5
Motorcycle/ATV	6.9	78.6	51.9
Motorcycle/SUV	3.2	86.1	59.7
Motorcycle/ATV/SUV	3.0	73.5	54.4
Total or average (a)	100.0	54.0	29.1

(a) Total for licensee households, means for other columns.

**Table 2. Michigan OHV Use July 1998 - June 1999 for 1998-99 Michigan OHV Licensees**

Vehicle type	Percentage			
	Public land riding	Private land riding	Hunting/ice fishing	Total
Motorcycle	58.8	38.4	2.8	100.0
ATV	21.1	50.0	28.9	100.0
SUV	41.4	24.2	34.4	100.0
All OHVs	30.6	43.9	25.5	100.0

### OHV Program Management

Motorcycle only segment members were likely to be more positive in their ratings of the Michigan OHV program and have knowledge of specific program aspects than other segments (Tables 3 and 4). Conversely, the ATV only segment was least knowledgeable of OHV program aspects. Those ATV only segment members that had some knowledge of OHV program aspects rated performance lower, except in the cases of law enforcement and safety education.

### OHV Licensee Demographics

The motorcycle only segment had the lowest mean age of all segments (Table 5). On average, motorcycle only licensees were 9 years younger than the ATV only segment, which had the highest average age. The motorcycle only segment also had the highest proportion of males, members with some college education and membership in OHV related organizations. By contrast, ATV only segment had the smallest percentage of members with some college education or membership in one or more OHV related organization. Median income levels were highest for the motorcycle/SUV segment. All segments had

household median income ranges higher than the median for Michigan's population.

Average household size was likely to be smallest for the motorcycle only segment and largest for licensees with all types of OHVs (Table 6). The proportion of household members who operated an OHV was also likely to be smallest for motorcycle only and largest for households with all types of OHVs. The ownership segment where household adults were most likely to have completed an OHV safety class was ATV/SUV and for household children it was the segment that owned all types of OHVs. In no ownership segment had more than one third of those 17 years old and under who actually operate the household's OHVs completed an OHV safety class.

The OHV riding history of households with motorcycles differs markedly from those without (Table 7). In motorcycle oriented segments, the mean age for first riding an OHV was less than 16 years old. Conversely, the ATV only segment, the average age for first OHV ride was almost 31. For every segment except ATV only, the first type of OHV ridden was most likely to be a motorcycle. Motorcycle related segments have much higher percentages of participation in competitive events than other segments.

**Table 3. Rating of Selected Aspects of Michigan OHV Program by Ownership Type for 1998-99 Michigan OHV Licensees (a)**

Ownership type	Regulations		Law Enforcement		Safety Education		Trail Maintenance	
	Mean rating	Percent no knowledge	Mean rating	Percent no knowledge	Mean rating	Percent no knowledge	Mean rating	Percent no knowledge
Motorcycle only	3.38	9.6	3.34	18.1	3.34	45.9	3.37	10.3
ATV only	2.92	21.3	3.23	38.8	3.51	46.2	2.95	51.1
SUV only	3.36	18.6	3.00	24.3	3.25	45.8	3.22	26.6
ATV/SUV	2.86	10.9	3.11	24.5	3.49	39.4	2.93	40.4
Motorcycle/ATV	2.97	10.9	3.29	21.2	3.46	35.3	3.16	17.9
Motorcycle/SUV	3.26	5.6	3.29	12.5	3.66	34.7	3.39	4.2
Motorcycle/ATV/SUV	2.94	8.8	2.90	13.2	3.30	36.8	2.82	17.6

(a) Rating scale: 5 = very good; 4 = good; 3 = OK; 2 = poor; 1 = very poor.

**Table 4. Rating of Selected Aspects of Michigan OHV Program by Ownership Type for 1998-99 Michigan OHV Licensees (a)**

Ownership type	Trail Design		Parking Areas		Trail Maps	
	Mean rating	Percent no knowledge	Mean rating	Percent no knowledge	Mean rating	Percent no knowledge
Motorcycle only	3.81	13.2	3.95	15.3	3.65	14.2
ATV only	3.20	54.0	3.36	61.0	3.23	54.5
SUV only	3.24	28.2	3.31	41.8	3.00	37.9
ATV/SUV	3.14	41.1	3.39	51.0	3.16	44.0
Motorcycle/ATV	3.67	23.7	3.65	27.6	3.41	23.1
Motorcycle/SUV	3.54	4.2	3.72	6.9	3.56	5.6
Motorcycle/ATV/SUV	3.02	19.1	3.75	26.5	3.11	19.6

(a) Rating scale: 5 = very good; 4 = good; 3 = OK; 2 = poor; 1 = very poor.

**Table 5. Selected Characteristics of 1998-99 Michigan OHV Licensees by Ownership Type**

Ownership type	Mean	Percent			Median
	Age	Male	With $\geq 1$ year of college education	Member of $\geq 1$ OHV organization	1998 Household Income
Motorcycle only	38.4	98.2	62.6	59.3	\$40,000-\$59,999
ATV only	47.3	93.6	41.8	17.7	\$40,000-\$59,999
SUV only	39.4	90.2	54.7	26.6	\$40,000-\$59,999
ATV/SUV	43.8	94.9	51.4	27.5	\$40,000-\$59,999
Motorcycle/ATV	38.6	90.9	52.6	44.9	\$40,000-\$59,999
Motorcycle/SUV	34.3	97.1	61.1	58.3	\$60,000-\$79,999
Motorcycle/ATV/SUV	38.9	90.9	51.5	52.9	\$40,000-\$59,999

**Table 6. Selected Characteristics of 1998-99 Michigan OHV Licensees by Ownership Type**

Ownership type	Adults ≥ 18 years old			Children ≤ 17 years old		
	Mean	Percent		Mean	Percent	
	Number	Operated OHV	Completed safety class	Number	Operated OHV	Completed safety class
Motorcycle only	1.91	64.3	8.2	0.84	52.9	16.0
ATV only	2.03	74.6	18.5	0.61	47.0	14.4
SUV only	2.10	70.7	8.2	0.67	18.3	0.9
ATV/SUV	2.10	80.4	22.2	0.63	46.4	12.0
Motorcycle/ATV	2.13	81.6	15.0	1.13	72.9	13.5
Motorcycle/SUV	2.03	76.3	8.6	0.65	68.2	18.2
Motorcycle/ATV/SUV	2.42	90.6	19.4	1.03	83.8	23.5

**Table 7. OHV Riding History by OHV Ownership Type for 1998-99 Michigan OHV Licensees**

Ownership type	Mean	Percent			
	Age first rode OHV	First rode cycle	First rode ATV	First rode SUV	Rode in competitive event (a)
Motorcycle only	15.1	91.6	7.0	1.4	31.9
ATV only	30.8	33.9	61.2	4.0	2.6
SUV only	20.7	45.4	10.9	43.6	7.7
ATV/SUV	23.4	45.6	37.1	17.3	3.4
Motorcycle/ATV	15.2	76.5	18.3	5.3	21.7
Motorcycle/SUV	13.0	84.3	10.0	5.7	40.0
Motorcycle/ATV/SUV	13.8	75.0	17.6	7.4	32.4

(a) Sanctioned event occurred in past 5 years

Region of residence in Michigan is dramatically different by segment (Table 8). The SUV only and all segments with motorcycles are concentrated in more urban southern Lower Michigan. By contrast, members of ATV oriented segments are much more likely to live in the more rural, forested northern two thirds of the state.

Motorcycle oriented segments generally have the highest levels of participation in non-motorized activities,

particularly those that are physically intense such as mountain biking and cross-country skiing (Table 9). Segments containing ATV only, ATV/SUV, and those owning all vehicle types are most likely to participate in ice fishing and deer hunting. Snowmobiling is most popular with segments owning multiple types of OHVs. The ATV only segment is least likely to participate in any of the selected activities with the exception of ice fishing and deer hunting.

**Table 8. Region of Residence of 1998-99 Michigan OHV Licensees from Michigan by OHV Ownership Type**

Ownership type	Percent		
	Upper peninsula	Northern lower peninsula	Southern lower peninsula
Motorcycle only	4.2	18.3	77.5
ATV only	26.6	23.0	50.4
SUV only	8.4	16.9	74.7
ATV/SUV	29.4	19.7	50.9
Motorcycle/ATV	10.3	15.9	73.8
Motorcycle/SUV	3.0	18.2	78.8
Motorcycle/ATV/SUV	17.9	19.4	62.7

**Table 9. Participation in Outdoor Recreation Activity Types during 7/98 – 6/99 by OHV Ownership Type for 1998-99 Michigan OHV Licensees**

Ownership type	Percent participating		
	Snowmobiling	Non-motorized activities (a)	Hunting and fishing
Motorcycle only	31.4	38.9	32.1
ATV only	26.7	21.6	72.0
SUV only	29.9	29.9	58.2
ATV/SUV	40.1	34.3	80.1
Motorcycle/ATV	46.2	31.4	59.6
Motorcycle/SUV	52.8	45.8	45.2
Motorcycle/ATV/SUV	63.2	32.4	76.5

(a) Non-motorized activities includes backpacking, cross country skiing, mounting biking, and hiking.

### Management Implications

#### ATV Only Segment of Licensees

The largest segment of OHV licensee holders is ATV only licensees. They comprise 53% of all OHV licensees. Furthermore, nearly half of them reside in the northern 2/3 of the state where only 15% of the state's population resides. A majority (60%) of this group does not make any use of the designated OHV trail/area system all of which is in the northern 2/3 of the state. Rather, over three fourths of the reported ATV use is on private property, including work around the home, second home, farm or vacant land property and in direct support deer hunting or ice fishing. Consequently, many in this segment appear disconnected from the OHV program that appears focused on designated trails/areas. When asked what should be changed about the current Michigan OHV program two of the three most common suggestions from ATV only members were to allow riding on road shoulders like snowmobiles and to reduce OHV license fees for those using the vehicles for hunting or fishing.

The Michigan DNR has done relatively little to communicate the benefits of the OHV program to non-trail oriented OHV users. First, they have invested over \$500,000 of OHV license dollars since the mid-1990s to restore OHV caused environmental damage. Much of this restoration directly improves fish and wildlife habitat. These grants often go to non-profits focused on fish and wildlife related pursuits such as Trout Unlimited. Considering that hunting and fishing are primary concerns of the ATV only segment, this would be an important positive message to this segment. It may also spur new partnerships among fish and wildlife related organizations to be grant recipients of future restoration funds. Furthermore, a properly designed and designated trail system should safeguard fish and wildlife habitat from impairment by those seeking trail riding experiences, which will also benefit ATV only licensee interests. Finally, OHV license monies finance OHV law enforcement. This in turn further protects fish and wildlife habitat.

However, recent DNR policy decisions restricting deer feeding and baiting to stop the spread of bovine

tuberculosis may present a further policy twist, as many purchased their ATVs specifically to support deer hunting activities. With almost two thirds of the ATV only segment involved in deer hunting, resentment concerning limitations on feeding and baiting may limit opportunities for communication and cooperation with the DNR.

Another issue for this group concerns age and personal mobility. The average age of ATV only licensees is 47, with over 21% 60 or more. Collectively, segment members also started riding OHVs during adulthood, rather than during adolescence like motorcycle oriented segments. This suggests that mobility impairments often related to age, such as arthritis and heart diseases may make ATVs more attractive for many to access outdoor recreational settings they formerly used without motorized assistance. This may bring about challenges related to the Americans with Disabilities Act concerning reasonable accommodation in the recreational use of public non-wilderness lands such as the state and national forests.

#### Motorcycle Oriented Segments of Licensees

Motorcycle only households, when compared to ATV only licensees, are much different. Overall, they were younger averaging 38 years old verses 47 years old for ATV only licensees. Moreover, they were much more likely to have started riding OHVs, especially motorcycles, as teenagers. They also tend to be better educated and be more active in other physically intense outdoor activities than non-motorcycle segments. As a whole, those who owned one or more motorcycles appear more satisfied with the current OHV program. The majority of their use (63%) is oriented to the designated trail/scramble system, which requires extensive travel of two or more hours with a tow vehicle for most to reach from southern Lower Michigan. They were more likely to be knowledgeable of and satisfied with the performance of OHV program managers than other segments. Of all the OHV segments, they also appear the most politically enfranchised, as over half are members of an OHV related organization. The two largest OHV organizations in Michigan, the Cycle Conservation Club and the American Motorcyclist Association, also directly represent motorcyclists by name.

Other segments that contain a motorcycle also seem to be more like motorcycle only segments than non-motorcycle segments. This includes early initiation of OHV use, higher use of the designated trail system and residing in the more urbanized southern Lower Peninsula of Michigan. This creates a challenge for broadening the scope of Michigan's OHV program to be more inclusive of ATVs. Currently all the designated trail system can be used by the motorcycle only segment, while only 60% is wide enough for use by ATVs and only 17% is wide enough for SUV use. To maintain highly technical trails, especially the type that appeal to those who ride in competitive motorcycle events, narrow (40 inches as handle bar height and 24 inches on the ground) trails are vital. Since the majority of grant money for trail maintenance and development also flows through non-profit motorcycle oriented groups, there is little incentive for change.

#### SUV Oriented Segments of Licensees

The SUV oriented segments, while relatively small, are strongly focused on the designated scramble area system. Operators seek places to test their vehicles and compete in such tests against other riders. Scramble areas that contain hill climbs and large areas of rolling, sandy terrain are especially attractive. The three most heavily visited scramble areas for such activities are part of a sand dune oriented state park near Lake Michigan and two areas of more than a thousand acres in the central portion of the northern Lower Peninsula, one on state forest land and one on national forest land. Development of additional scramble areas is controversial, as law enforcement, safety and environmental problems are daunting. All attempts to develop additional public facilities for this activity in southern Lower Michigan, even in abandoned industrial sites such as gravel pits, have met with strong opposition and have been stopped.

Because of their street licensed status, this segment can use the forest road system to support activities such as deer hunting and dispersed camping. However, most of the off-road trail system is inaccessible. Widening existing ATV or motorcycle trails to accommodate these larger vehicles would present significant safety risks and environmental challenges. The 17% of the trail system with 96-inch wide trail that accommodates these vehicles is also discontinuous, generally being comprised of sections of forest roads designated as OHV trail so loops of the cycle and ATV trail system can be connected. Street licensed vehicles not possessing an ORV license can also legally use this 96-inch wide trail. Hence, like the ATV only segment, SUV oriented segments have little use of the total trail system and no exclusive use areas.

#### **Conclusion**

The complexity of OHV management is steadily increasing in Michigan as the range of OHV options expands and as competition for designated trail/area space increases within the OHV community and beyond with other land uses. This segmentation of OHV ownership types provides insight into these complexities and suggests future challenges.

Principally it suggests that treating OHVs as a single class of vehicles whose operators have similar interests may be ill advised and that managers need to become more sophisticated in their approach to OHV use and users.

#### **References**

Alexander, S., & Jansen, G. (1977). Off-Road vehicles: Gasoline consumption and patterns of use. Lansing: Office of Surveys and Statistical Services, Michigan Department of Natural Resources.

Belknap, L. (1988). Off-highway motorcycles. In The President's Commission on American Outdoors: A Literature Review. Activities-19-29.

Crimmins, T. (1999). Colorado OHV user survey: Summary of results. Coeur d'Alene, ID: Trails Consultant.

Hope, J. (1972). The invasion of the awful ORVs. Trends, 9(3), 14-22.

Michigan Public Act 319 of 1975. An act to provide for the regulation and registration of off-road vehicles.

Nelson, C. (1989). Registered Michigan off-road vehicle use and users. East Lansing: Department of Park and Recreation Resources, Michigan State University.

Nelson, C. (1996). Registered Michigan off-road vehicle use and users: Forest policy implication. Northern Journal of Applied Forestry, 13(2), 84-88.

Nelson, C. (1999). An assessment of Forest Management Division's recreation programs. Lansing: Forest Management Division, Michigan Department of Natural Resources.

Nelson, C., Lynch, J., & Stynes, D. (2000). Michigan licensed off-road vehicle use and users:1998-99. East Lansing: Department of Park, Recreation and Tourism Resources, Michigan State University.

Peine, J. (1973). Land management for recreational use of off-road vehicles: Tucson Arizona study. In D. Holecek (Ed.), Proceedings of the 1973 Snowmobile and Off the Road Vehicles Research Symposium (Tech. Rep. No. 9, pp. 9-32). East Lansing: Michigan State University, Department of Park and Recreation.

Propst, D., Schomaker, J., & Mitchell, J. (1977). Attitudes of Idaho off-road vehicles users and managers (Bulletin No. 23). Moscow: College of Forestry, Wildlife and Range Sciences, University of Idaho.

Sheridan, D. (1979). Off-road vehicles on public land. Washington DC: Council on Environmental Quality.

USDI. (1971). Off road recreational vehicle task force study report. Washington DC: US Department of the Interior.

# RECREATION CONFLICT OF RIPARIAN LANDOWNERS WITH PERSONAL WATERCRAFT AND MOTORBOAT USE ALONG THE NEW YORK'S GREAT LAKES

Cheng-Ping Wang

Graduate Student, SUNY College of Environmental Science and Forestry, 1 Forestry Drive, Syracuse, NY 13210

Chad P. Dawson

Professor, SUNY College of Environmental Science and Forestry, 1 Forestry Drive, Syracuse, NY 13210

---

**Abstract:** Riparian landowners of the New York's Great Lakes (NYGL) are reportedly in conflict with some motorboat and personal watercraft (PWC) use. Goal interference theory was used to explain landowners' perceived conflict caused by motorboat and PWC use. A study conducted in the NYGL area surveyed the riparian landowners' perceived conflict and problems caused by motorboat and PWC use. Data were collected from six sites: Alexandria Bay, Sandy Pond, Sodus Bay, Olcott Harbor, N. Niagara River, and Handford Bay. Study results showed three of Jacob and Schreyer's four conflict dimensions were determinants of landowners' perceived conflict. Only the resource specificity dimension was not statistically significant in predicting landowners' perceived conflict.

---

## Introduction

Riparian landowners on the New York's Great Lakes (NYGL) reportedly have experienced conflict with personal watercraft (PWC) and motorboat users (Wang & Dawson, 2001). The various types of conflict from PWC and motorboat use include safety, environmental, and unsafe behavior issues. PWC operation has been a safety issue, such as speeding, operating too close to swimmers or facilities, jumping boat wakes, and cutting across the courses of other water craft. Environmental issues can include noise, water pollution, odors, disturbing wildlife habitat, and destroying water plants. With the rapidly increasing use of PWC and motorboats, these problems have become potentially more serious to riparian landowners.

Increased recreation use on water bodies (e.g., rivers or lakes) can result in conflicts between waterfront landowners and other waterfront users. Conflict between riparian landowners and boaters has been the focus of several studies (Adcock, 1999; Dawson et al., 1982; Roggenbuck & Kushman, 1980). Most of these studies compared the landowners' and river visitors' perceptions of river conditions and their different preferences on management actions. Few studies mentioned what social-psychological factors influenced riparian landowners' perceived conflict. Those factors can help resource

managers and researchers to understand how landowners perceive conflict and take management actions or develop educational programs to reduce that conflict.

Compared to general recreational users, such as swimmers, anglers, PWC users, or motorboat users, riparian landowners may have several unique characteristics that cause them to feel conflict differently from participants in other activities. First, in addition to encountering other recreational users when participating in recreation activities, landowners may be disturbed by the noise from a passing motorboat or PWC without direct contact, or by observing a motorboat or PWC operating close to swimmers. Second, unlike recreation users who can substitute or displace their activities, landowners own properties along the water body and are attached to their property for which there is no easy substitution. Third, various attractions of a site, such as recreational activities, scenery, the price of land or geographic characteristics, may attract different types of landowners. For example, because of the numerous islands in the Alexandria Bay Area, watercraft are not only recreation equipment, but also transportation with which local people can go to work or visit friends.

Goal interference theory (Jacob & Schreyer, 1980) has been applied to explain recreation conflict between various recreation users, such as the conflict between cross-country skiers and snowmobilers (Jackson & Wong, 1982), hikers and stock users (Blahna et al., 1995; Watson et al., 1994) and canoeists and motorboaters (Aldelman et al., 1982; Ivy et al., 1992). Goal interference theory proposed four dimensions of conflict factors — activity style, resource specificity, mode of experience, and lifestyle tolerance. Among these four dimensions, lifestyle tolerance is one determinant that consistently predicts recreation conflict. Previous studies usually identified lifestyle based on the recreation activities users participated in, such as PWC users, motorboat users and landowners; however, whether recreation users have ever participated in the activities they encounter may also influence their perceptions of goal interference (Wang & Dawson, 2001). For example, landowners owning a PWC may have different conflict levels than those without a PWC. In addition, landowners from different sites may have different lifestyles causing different conflict levels. Therefore, this study examined if riparian landowners should be categorized based on study sites or watercraft equipment ownership.

The purpose of this paper is twofold. First, the relationships of conflict factors to study site and landowners' ownership of a PWC and/or a motorboat were examined. Second, based on the goal interference theory, this study tested the four important factors for predicting the conflict of NYGL riparian landowners with PWC and motorboat users.

## Methods

For this study, New York's Great Lakes area was considered to include the shoreline of the St. Lawrence River, Lake Ontario, the Niagara River and Lake Erie within New York State. Data was collected from six sites

along NYGL with relatively high motorboat and PWC use. The six sites were: Alexandria Bay, Sandy Pond, Sodus Bay, Olcott Harbor, N. Niagara River, and Hanford Bay. Alexandria Bay and Sodus Bay are regional recreation attractions and have heavy recreational use during summer months.

The landowner sample was selected from the tax maps of the six study sites because of the detailed information available, such as: development on the property (e.g., docks, buildings, and land), the owner's name and address, and use type (e.g., home or summer house). The range of each study site extended one mile along the coast from either the mouth of the river or the edge of the bay; the sample range also included those landowners along the bays and rivers: The sample was selected systematically and did not include vacant lands or lands with docks only. About 100 individuals were selected from each study site with a total of 634 landowners selected overall. A mail survey with one initial mailing and two follow-up mailings was conducted in summer, 1999.

The independent variables used in this paper were factors derived from the 10 dimensions containing 94 survey items and reported previously (Wang & Dawson, 2001). The 10 dimensions were: motivation, activity style, resource specificity, lifestyle tolerance, mode of experience,

problem from PWC use, problem from motorboat use, experience, sensitivity to conflict, and expected behavior of PWC and motorboat users. Each dimension contains several factors derived from factor analysis, and each factor contains one or several survey items. The relationships among dimensions, factors and survey items are listed in Table 1.

Respondents were also asked to report their ownership of personal watercraft (PWC) and motorboats. Four different ownership groups could be categorized, including landowners owning a PWC and motorboat, landowners owning a PWC only, landowners owning a motorboat only, and landowners without any PWC or motorboat. Through analysis of variance (ANOVA) with the least square distance (LSD) option, Wang and Dawson (2001) found that landowners owning a PWC and motorboat and landowners owning a PWC could be grouped together because only four items were different. Therefore, the four types of respondents were combined into three study groups based on their ownership similarities (Wang & Dawson 2001). The three study ownership groups were named: landowners owning a motorboat and PWC (L-m-pwc), landowners owning a motorboat only (L-m), and landowners without any PWC or motorboat (L). This study developed perceived conflict models for each of the three study groups.

**Table 1. The Relationship among Dimensions, Factors, and Survey Items**

Dimension	Factor	# of items	Dimension	Factor	# of items
Motivation	Nature enjoyment	3	Problem from PWC use	Operator behavior & machine impact	6
	Relax, rest & get away	5		Environment problems	4
	Social interaction	4	Problem from Motorboat use	Machine impact problems	3
	Excitement & exercise	2		Environment related problems	4
	Skill & equipment	3		Operator behavior problems	3
Activity Style	Self-identity	5	Experience	Year	1
	Value sharing	4		Importance of land ownership	1
Resource Specificity	Place dependence <sup>a</sup>	3	Sensitivity of conflict	Sensitivity to motorboating	1
	Place identity <sup>a</sup>	8		Sensitivity to PWC	1
Lifestyle Tolerance	Evaluation of jet skiers	9	Expected behaviors	Positive statements about PWC	3
	Evaluation of motorboaters	9		Negative statements about PWC	6
Mode of exp.	Focus on social and the nature	4		Regulations	2

a. Intending to test place attachment theory, this paper renamed factor "Best Place" and "Place Dependence" in the previous paper (Wang & Dawson, 2001) to "Place Dependence" and "Place Identity" respectively in this paper.

## Results

A total 634 initial surveys were mailed out, and 37 surveys were undeliverable. After two follow-up mailings, the adjusted response rates for the six sites were between 53% and 77%, with an average of 63% (Table 2).

A two-way contingency table (Table 3) shows that ownership combination were significantly associated with the study sites (Chi-Square=75.889, df=10, and P-value<0.001). Most landowners at Alexandria Bay, Sandy Pond, and Sodus Bay have a motorboat, but only 9%~14% of the landowners at these three do not own any motorboat

**Table 2. Mail Survey Response Rates from the Six Study Sites**

Study site	Sample	Undelivered	Returned	Response rate
Alexandria Bay	115	8	66	62%
Sandy Pond	114	5	71	65%
Sodus Bay	123	9	88	77%
Olcott Harbor	100	3	51	53%
N. Niagara River	82	4	48	62%
Hanford Bay	100	8	50	54%
<b>Total</b>	<b>634</b>	<b>37</b>	<b>374</b>	<b>63%</b>

or PWC. About half of landowners at Olcott and N. Niagara River do not have a motorboat or PWC, and 6%~8% of the landowners at these two sites own a PWC. Compared to other study sites, Sandy Pond and Hanford Bay have more landowners who own a PWC. These results indicate that whether riparian landowners own a motorboat or a PWC is associated with the characteristics of the study sites.

The relationship between conflict level and study site was examined (Table 4) and Chi-square statistics show landowners' perceived conflict from motorboating is significantly associated with the study sites (Chi-square=21.092; df=5; P-value=0.001). Alexandria Bay has the highest reported conflict level with 48% of landowners feeling conflict from motorboat users. Sandy Pond landowners (14%) reported the least interference from motorboat use.

Interference from PWC use is not significantly associated with the study sites (Chi-square=10.012, df=5, and P-value=0.075). Alexandria Bay has the highest reported conflict level from PWC use (55%) and the N. Niagara River (29%) landowners report the least conflict from PWC use.

Overall (Table 4), riparian landowners at Alexandria Bay reported the highest conflict levels from both PWC use and motorboat use probably because of its highly developed water-based tourism and recreation use. Landowners at Sandy Pond, Sodus Bay, Olcott Harbor, and Hanford Bay reported less interference from motorboat use than from PWC use. One possible reason for this could be spatial

separation of PWC and motorboat use in bays or ponds, where motorboaters need to operate their boats further from the shoreline than PWC users because of the shallow water near shore. However, landowners on the N. Niagara River reported more conflict from motorboat use than from PWC use not only because of the low use level by PWC, but also because high river banks distance landowners from PWC use.

In order to understand how ownership groups and study sites affect conflict factors and landowners' problem perceptions, multiple analysis of variance (MANOVA) was used (Table 5). Results of MANOVA indicate several factors were significant, including the importance of the land ownership, sensitivity to PWC use, two motivation factors, evaluation of PWC users, problems from PWC use, problems from motorboat use, and two of the social value factors about PWCs. For these differences, most affects were caused by ownership groups but not by study site or the interaction between study site and ownership groups. Only the importance of land ownership was affected by study site, and three factors had affects on the interaction between study site and ownership combination, including: importance of land ownership and two of the motivation factors (relax, rest & get away and social interaction). These results indicate that ownership groups were an important variable that influences landowners' perceived conflict caused by PWC and motorboat users, but study site is not so important.

Logistic regression was applied to examine the four Jacob and Schreyer (1980) dimensions of conflict factors that reportedly cause the interference felt by the three groups from PWC use (Table 6). For landowners owning a motorboat and PWC (L-m-pwc), no factor was significant to predict perceived conflict, and most of this group felt no conflict with PWC users. For landowners owning a motorboat (L-m), Self-identity and Lifestyle Tolerance were significant in predicting the perceived conflict. For landowners (L), Lifestyle Tolerance and Focus of Social and the Nature were significant in predicting landowners' perceived conflict. When all landowner types were pooled together, Self-identity, Lifestyle Tolerance, and Focus of Social and the Nature emerged as predictors of landowners' perceived conflict attributed to PWC use.

Comparing the three group models, lifestyle tolerance is the only relatively consistent factor in predicting landowners' perceived conflict. The negative relationship of lifestyle tolerance with perceived conflict indicates that landowners with lower lifestyle tolerance levels reported more interference when encountering a PWC. Self-identity, a factor of the activity style dimension, is only significant in the model of landowners owning a motorboat (L-m). Its positive value indicated landowners with higher self-identity scores reported more conflict with PWC use. Mode of experience is significant in the model of landowners (L), the positive value indicated landowners with higher scores of focusing on the social and natural settings felt more interference from PWC use. Three factors (Value Sharing, Place Dependence, and Place Identity) were not significant to predict landowners' perceived conflict with PWC use.

**Table 3. Percent of Each Ownership Group in Each Study Area**

Study Sites	Ownership Groups Percent			Total
	L-m-pwc	L-m	L	
Alexandria Bay	16.7	74.2	9.1	100
Sandy Pond	23.9	62.0	14.1	100
Sodus Bay	14.8	75.0	10.2	100
Olcott Harbor	5.9	39.2	54.9	100
N. Niagara River	8.3	41.7	50.0	100
Hanford Bay	22.0	38.0	40.0	100

**Table 4. Percent of NYGL Landowners' Reporting Interference from Motorboat and PWC Use**

Study sites	Interference from motorboat use		Interference from PWC use	
	No	Yes	No	Yes
Alexandria Bay	52	48	45	55
Sandy Pond	86	14	66	34
Sodus Bay	64	36	55	45
Olcott Harbor	75	25	58	42
N. Niagara River	67	33	71	29
Hanford Bay	76	24	53	47

**Table 5. Multiple Analysis of Variance (MANOVA) P-value Test Results for Various Social-psychological Factors (P-values<0.05 are in bold type)**

	Corrected Model	Effect from study site	Effect from ownership	Interaction of site and status
<b>Experience</b>				
Year	0.619	0.361	0.628	0.830
Importance of land ownership	<b>0.022</b>	<b>0.008</b>	<b>0.017</b>	<b>0.010</b>
<b>Conflict Sensitivity</b>				
Sensitivity to motorboat use	0.372	0.134	0.980	0.597
Sensitivity to PWC use	<b>&lt;0.001</b>	0.565	<b>&lt;0.001</b>	0.279
<b>Motivation</b>				
Nature enjoyment	0.168	0.085	0.724	0.087
Relax, rest & get away	0.129	0.412	0.060	<b>0.018</b>
Social interaction	<b>0.017</b>	0.794	<b>0.027</b>	<b>0.014</b>
Excitement & exercise	0.364	0.623	<b>0.008</b>	0.777
Skill & equipment	<b>&lt;0.001</b>	0.667	<b>&lt;0.001</b>	0.083
<b>Activity Style</b>				
Self-identity	0.158	0.664	0.148	0.435
Value sharing	0.808	0.726	0.530	0.608
<b>Resource Specificity</b>				
Place dependence	0.610	0.939	0.769	0.447
Place identity	0.319	0.637	0.523	0.117
<b>Lifestyle Tolerance</b>				
Evaluation of jet skiers	<b>&lt;0.001</b>	0.496	<b>&lt;0.001</b>	0.472
Evaluation of motorboaters	0.136	0.076	0.510	0.300
<b>Mode of Experience</b>				
Focus of social and the nature	0.762	0.950	0.394	0.430
<b>Problem from PWC Use</b>				
Operation behavior & machine impact	<b>&lt;0.001</b>	0.659	<b>&lt;0.001</b>	0.193
Environment problems	<b>&lt;0.001</b>	0.973	<b>&lt;0.001</b>	0.257
<b>Problem from Motorboat Use</b>				
Machine impact problems	<b>0.003</b>	0.201	0.062	0.084
Environment related problems	<b>0.005</b>	0.924	<b>0.001</b>	0.568
Operator behavior problems	<b>0.009</b>	0.577	<b>0.039</b>	0.059
<b>Expected Behaviors</b>				
Positive statements about PWC	<b>&lt;0.001</b>	0.666	<b>&lt;0.001</b>	0.278
Negative statements about PWC	<b>&lt;0.001</b>	0.831	<b>&lt;0.001</b>	0.385
Regulations	0.474	0.969	0.170	0.676

**Table 6. Regression Coefficients of Significant Variables in Predicting the Landowners' Perceived Conflict Caused by PWC Use**

	L-m-pwc	L-m	L	Total
Constant	-1.340	-1.236	-5.882	-3.165
<b>Activity Style</b>				
Self-identity <sup>a</sup>	—	0.843	—	0.428
Value Sharing <sup>a</sup>	—	—	—	—
<b>Resource Specificity</b>				
Place Dependence <sup>a</sup>	—	—	—	—
Place Identity <sup>a</sup>	—	—	—	—
<b>Mode of Experience</b>				
Focus of Social and the Nature <sup>b</sup>	—	—	1.343	0.583
<b>Lifestyle tolerance<sup>c</sup></b>	—	-1.580	-1.279	-1.388
Nagelkerke RS	0.000	0.444	0.458	0.410
Correct prediction (%)	79.2	76.4	78.5	77.7

- a. Variables coded on a 5-point scale from "strongly disagree" (-2) to "strongly agree" (2).  
b. Variables coded on a 6-point scale from "never focus" (0) to "extremely focused" (5).  
c. Variables coded on a 5-point scale from "negative term" (-2) to "positive term" (2).

The conflict factors were used to predict the interference between the three types of riparian landowners and motorboat users (Table 7). The activity style, lifestyle tolerance, and mode of experience dimensions are statistically significant in predicting landowners' perceived conflict attributed to motorboat use. For landowners owning a motorboat and PWC (L-m-pwc), Self-identity and Lifestyle Tolerance are significant in predicting landowners' perceived conflict. For landowners owning a motorboat only (L-m), Lifestyle Tolerance and Focus of Social and the Nature significantly affect landowners' perceived conflict from motorboat use. For landowners without any PWC or motorboat (L), Value Sharing, Lifestyle Tolerance, and Focus of Social and the Nature are significant in predicting landowners' perceived conflict from motorboat use. If all three types of landowners are pooled together, only Lifestyle Tolerance and Focus of Social and the Nature are significant in the perceived conflict model.

Comparing the significant predictors of conflict caused by motorboat use, it was found that lifestyle tolerance with its negative relationship to interference was the only consistent factor across the three landowner groups. Mode of experience was significant in two of the three groups: landowners owning a motorboat (L-m) and landowners (L). In addition, the positive regression coefficients for mode of experience indicate landowners who focus more on the social and natural settings felt more interference from motorboat use. Landowners owning a motorboat and PWC (L-m-pwc) and landowners (L) both are significant in activity style dimension, but in different factors. For landowners owning a motorboat and PWC (L-m-pwc), a positive coefficient for Self-identity indicates those who identify themselves more as landowners feel more interference from motorboat use. However, for landowners (L), Value Sharing had a negative value, indicating landowners who shared their values with others felt less interference from motorboat use. In addition, both factors in the resource specificity dimension, Place Dependence

and Place Identity, do not significantly predict landowners' perceived conflict with motorboat use.

## Discussion

Multiple analysis of variance results showed the social-psychological conflict factors and landowners' problem perception were most significantly different in activity status, but not in study site or in the interaction between activity status and study site. This indicated the relationship between social-psychological factors and landowners' perceived conflict. The study site was not an important influence, but ownership groups were important. This also supports previous empirical studies in which conflicted groups were categorized based on the activities respondents participated in, such as hikers versus mountain bikers (Ramthun, 1995) or skiers versus snowboarders (Vaske et al., 2000).

This study applied goal interference theory (Jacob & Schreyer, 1980) to explain riparian landowners' conflict with motorboat and PWC use. Logistic regression results indicate goal interference theory is a good model to explain riparian landowners' interference from PWC and motorboat use. However, only the lifestyle tolerance dimension and the mode of experience dimension are relatively consistent in predicting conflict in both overall models.

Like previous studies (Ivy et al., 1992; Jacob & Schreyer, 1980; Ramthun, 1995), this paper suggests that the lifestyle tolerance dimension is important in predicting landowners' conflict with PWC and motorboat use in NYGL's area. In general, lifestyle tolerance negatively relates to goal interference; indicating visitors more tolerating of the lifestyle of encountered groups will perceive less interference. Although not significant in every model, the mode of experience dimension helps predict recreation conflict, especially, for landowners without any PWC or motorboat, it became an important factor in determining their perceived conflict from PWC and motorboat use.

**Table 7. Regression Coefficients of Significant Variables in Landowners' Predicting Conflict Caused by Motorboat Use**

	L-m-pwc	L-m	L	Total
Constant	-1.657	-3.033	-5.344	-3.049
<b>Activity Style</b>				
Self-identity <sup>a</sup>	1.175	—	—	—
Value Sharing <sup>a</sup>	—	—	-0.813	—
<b>Resource Specificity</b>				
Place Dependence <sup>a</sup>	—	—	—	—
Place Identity <sup>a</sup>	—	—	—	—
<b>Mode of Experience</b>				
Focus of Social and the Nature <sup>b</sup>	—	0.795	1.363	0.754
<b>Lifestyle Tolerance<sup>c</sup></b>	-1.227	-0.921	-0.733	-0.943
Nagelkerke RS	0.270	0.181	0.346	0.191
Correct prediction (%)	77.4	69.5	76.2	71.7

a. Variables coded on a 5-point scale from "strongly disagree" (-2) to "strongly agree" (2).

b. Variables coded on a 6-point scale from "never focus" (0) to "extremely focused" (5).

c. Variables coded on a 5-point scale from "negative term" (-2) to "positive term" (2).

These results support goal interference theory in which visitors who focus more on their activity in certain ways are more prone to perceive interference. However, the activity style dimension was not consistent in both model sets: PWC conflict models and motorboat conflict models. Self-identity, one factor of the activity style dimension, was only significant in the PWC model of landowners owning a motorboat (L-m) and in the motorboat model of landowners owning a motorboat and PWC (L-m-pwc). Value sharing, another factor of the activity style dimension, was only significant in the PWC model of landowners without any motorboat or PWC (L). Therefore, this study did not support activity style as a strong determinant of recreation conflict.

The resource specificity dimension proposed by goal interference theory is not a significant determinant in both model sets. The resource specificity dimension corresponds to two factors, Place Dependence and Place Identity. Neither of these two factors were significant in any model. These results do not support goal interference theory and other empirical studies (Adelman et al., 1982; Vaske et al., 2000). Resource specificity is not a useful determinant of landowners' perceived conflict perhaps because most landowners thought their property and the NYGL area was so important to their daily life they reported high values for these two factors. Therefore, these two factors were more like constants among landowners.

Comparing the two conflict model sets -- PWC conflict models and motorboat conflict models -- it was found that landowners' experience with the activity they encountered would affect the prediction ability of goal interference theory. In the PWC conflict model, for instance, the six conflict factors explain the least variation in the perceived conflict model for landowners owning a motorboat and PWC (L-m-pwc). Similarly, in the motorboat conflict model, the six factors explain very little of the variation in perceived conflict for landowners with a motorboat (L-m). Goal interference theory best explains conflict for landowners without any motorboat or PWC (L) in both models. This suggests that landowners without experience with the activity they encountered had more crystallized norms and had a clear pattern in perceiving conflict from motorboat and PWC use. These results are supported by a similar idea from previous studies (Vaske et al., 2000) in which goal interference theory could better explain out-group conflict, but not in-group conflict.

Goal interference theory (Jacob & Schreyer, 1980) can help explain landowners' conflict with motorboat and personal watercraft use. However, only mode of experience and lifestyle tolerance were relatively consistent factors in predicting landowner's interference. Resource specificity is not a determinant in predicting landowners' perceived conflict with PWC and motorboat use. The results of the study suggest that recreation conflict is more complex than past studies found, as equipment and visitors' experiences can affect their perceived conflict.

## Literature Cited

- Adcock, A. M. (1999). Predictors of management preferences among riverfront landowners and boaters on the Great Egg Harbor River: A study of stakeholders in a multi-jurisdictional setting. Unpublished master thesis, Virginia Polytechnic Institute and State University.
- Adelman, B. J. E., Heberlein, T. A., & Bonnicksen, T. M. (1982). Social psychological explanations for the persistence of a conflict between paddling canoeists and motorcraft users in the Boundary Waters Canoe Area. Leisure Sciences, *5*, 45-61.
- Blahna, D. J., Smith, K. S., & Anderson, J. A. (1995). Backcountry llama packing: Visitor perceptions of acceptability and conflict. Leisure Sciences, *3*, 185-204.
- Dawson, C. P., Decker, D. J., & Smolka Jr., R. A. (1982). Management preferences of boaters and landowners along the Upper Delaware Scenic and Recreation River. In D. W. Lime (Tech Coordinator). Forest and River Recreation: Research Update (Miscellaneous Publication 18, pp. 14-19). Agriculture Forest Experiment Station, Department of Forest Resources, University of Minnesota, St. Paul.
- Ivy, M. I., Stewart, W. P., & Lue, C. C. (1992). Exploring the role of tolerance in recreational conflict. Journal of Leisure Research, *24*(4), 348-360.
- Jackson, E. L., & Wong, A. G. (1982). Perceived conflict between urban cross-country skiers and snowmobilers in Alberta. Journal of Leisure Research, *1*, 47-62.
- Jacob, G. R., & Schreyer, R. (1980). Conflict in outdoor recreation: A theoretical perspective. Journal of Leisure Research, *12*, 368-380.
- Ramthun, R. (1995). Factor in user group conflict between hikers and mountain bikers. Leisure Sciences, *17*, 159-169.
- Roggenbuck, J. W., & Kushman, K. G. (1980). Riparian landowners' attitudes toward a state wild river program. Journal of Forestry, *78*(2), 91-93.
- Vaske, J. J., Carothers, P., Donnelly, M. P., & Baird, B. (2000). Recreation conflict among skiers and snowboarders. Leisure Sciences, *22*, 297-313.
- Wang, C. P., & Dawson, C. P. (2001). A comparison of recreation conflict factors for different water-based recreation activities. In G. Kyle (Compiler). Proceedings of the 2000 Northeastern Recreation Research Symposium (Gen. Tech. Rep. NE-276, pp. 121-130). Radnor, PA: USDA, Forest Service, Northeastern Research Station.
- Watson, A. E., Niccolucci, M. J., & Williams, D. R. (1994). The nature of conflict between hikers and recreational stock users in the John Muir Wilderness. Journal of Leisure Research, *26*(4), 372-385.

## USER PREFERENCES FOR SOCIAL CONDITIONS ON THE ST. CROIX INTERNATIONAL WATERWAY

Jamie Hannon

Graduate Student, University of Maine, Parks, Recreation and Tourism Program, Nutting Hall, Orono, ME 04469

John J. Daigle

Assistant Professor, University of Maine, Parks, Recreation and Tourism Program, Nutting Hall, Orono, ME 04469

Cynthia Stacey

Associate Professor, University of New Brunswick, Recreation and Leisure Studies Program, Fredericton, NB E3B 5A3

---

**Abstract:** In cooperation with the St. Croix International Waterway Commission the University of New Brunswick and University of Maine conducted a study of waterway users during the summer of 1999 to determine: 1) characteristics of the waterway visit, including activities, method of travel on the waterway, length of stay, camping conditions encountered; 2) characteristics of visitors, including type of groups, previous experience, place of residence, and other sociodemographic descriptions; and 3) visitor preferences for resource and social conditions encountered on the waterway. A mailback questionnaire was administered to a sample of waterway users. Approximately 404 usable questionnaires were returned, for an overall response rate of 62 percent. One of the management objectives of the St. Croix waterway is to provide opportunities for secluded watercourse travel and camping. The waterway has a diverse range of water-oriented settings, defined by geographic features, accessibility, and use history. Therefore, we examine visit and visitor characteristics based upon travel within the areas of the waterway. We compare the significance of indicators for secluded travel and camping for experience quality among the different user groups.

---

### Introduction

The St. Croix International Waterway is a complex of lakes and river segments stretching approximately 115 miles (185km) along the border of eastern Maine and New Brunswick. The waterway is comprised of three major geographic zones: a headwater lakes and river section characterized by mostly undeveloped shoreline, a lower river section of developed and industrialized river, and a tidal estuary and bay system. This study is concerned exclusively with the headwater lakes and upper river section. This region is the longest stretch of undeveloped international waterway east of the Boundary Waters Canoe Area of Minnesota and Ontario. It is listed as one of the state of Maine's Twenty Outstanding Rivers, and it is officially recognized as the St. Croix Waterway Recreation Area by the province of New Brunswick. Most

significantly, the St. Croix was included in the Canadian National Heritage river system in 1991, the first such designation in Atlantic Canada.

Since the waterway is an international boundary, recreation and resource management is conducted by several agencies, including the International Joint Commission, the Bureau of Parks and Lands and the State Forest Service in Maine, and the Department of Natural Resources and Energy in New Brunswick. In 1986 a Memorandum of Understanding between Maine and New Brunswick created the St. Croix International Waterway Commission, an advisory agency, that has since taken the lead in studying waterway-related issues and coordinating planning for future waterway management needs. In a 1993 report, the St. Croix International Waterway Commission noted that "distinct land and water management policies are applied without integration on opposite sides of the waterway, leaving it vulnerable to incompatible uses and potential quality loss" (SCICW, 1993, p. 13). It called for further recognition of the region as an "International Heritage Waterway." At the same time it also recommended a range of policies intended to guide development and management in a way that protects the area's cultural and natural heritage, environmental quality, and traditional high-quality recreational opportunities. Particular focus of the latter is placed on secluded backcountry canoe experiences available in the headwater lakes and upper river region.

Providing and maintaining a quality recreation experience requires an understanding of the resource and social conditions that exist on the waterway. Indicators and standards of quality illustrate what visitors to an area expect, prefer, or will accept as part of their recreation experience. This concept has emerged as a central focus of recreation management. Indicators of quality are measurable variables that help define the quality of the recreation experience and standards of quality that define the minimum acceptable conditions of indicator variables (Manning, 1999). Good indicators are practical to measure quantitatively, sensitive to the type and amount of use, and potentially responsive to management control (Lucas & Stankey, 1985; Watson et al., 1998). Several studies examining indicators of quality have revealed some variables to be more important than others (Manning, 1999). For example, litter and other signs of visitor use impacts appear to be more important as compared to management-related impacts such as signs and presence of rangers. Social indicators of quality at secluded campsite locations are more important than ecological indicators. Visitors to more primitive areas or sites may be generally more sensitive to a variety of potential indicators of quality than visitors to more highly used and developed areas or sites. Watson and others (1998) have reported similarity in the rankings of social and resource indicators by wilderness boaters even though users were found to have diverse motivations or experience preferences. On the St. Croix waterway, users have unrestricted access to both primitive and developed sites and a wide range of water-oriented opportunities. The situation suggests the need to understand the diverse recreation experiences and indicators of quality.

One of the management objectives of the St. Croix waterway is to provide opportunities for secluded watercourse travel and camping. The management objective related to "secluded," much like "solitude," is not commonly measured directly but rather through indicators believed to provide feedback on forces that threaten the "secluded" or "solitude" opportunities (Watson et al., 1998). For example, commonly used indicators for this factor include "the number of groups that camp within sight or sound of my campsite" or "the number of boats I see along the waterway in a day". In attempting to understand the management needs for providing for secluded travel and camping in the St. Croix Waterway, this paper does three things. Based upon visitor surveys we first report trends in visit and visitor characteristics in a way that distinguishes the distinct sub-groups of the user population. Second, we examine the significance of different indicators measuring solitude to the waterway experience desired by these sub-groups. Finally, we assess the varying standards held by each of these distinct sub-groups for these indicators of solitude. Several important management implications emerge.

## Methods

A multi-stage cluster sampling design was utilized to select users of the St. Croix waterway. The sample period was from June 6, 1999, to September 10, 1999. The primary sampling unit was blocks of time established as sampling shifts of either 7:00 a.m. to 1:00 p.m. or 1:00 p.m. to 7:00 p.m. In total 14 put-in or take-out locations along the waterway were covered by four field technicians. To reduce travel time and distances for the technicians, two were responsible for four sites each and two were responsible for three sites each. This division created four sampling clusters. For each cluster, the sample sites and time were determined by random selection. Each waterway user was greeted, briefly introduced to the purpose of the study, and asked to participate. If users agreed, an interview lasting approximately 2 minutes, was used to determine group type, travel destination, length of visit, number of previous visits and average number of visits per season or if this was the first time visiting the St. Croix waterway. Also, the technician noted the type and number of boats in the group as well as group size.

A self-administered, mailback questionnaire was sent to the sample of waterway users who agreed to receive and complete the survey. Questionnaires were sent to 332 users from the United States, 336 users from Canada, and 13 users from another country, for a total of 681. The mailout procedure basically followed the approach recommended by Dillman (1983). The initial mailing included a questionnaire with a cover letter and postage-paid business reply envelope. One week after the first mailing, a postcard reminder and thank you was sent to everyone. Three weeks after the initial mailing, a follow-up mailing was sent to those who had not responded. A different cover letter in this mailing emphasized the importance of everyone's response. Another questionnaire and postage-paid business reply envelope were included. A second follow-up was

sent to those who still had not responded 7 weeks after the initial mailing.

In response to the Waterway Commission's strong desire to protect opportunities for secluded backcountry canoe travel and camping among other desires, we employed a similar visitor survey approach conducted by Watson and others (1992). Among other variables we obtained assessments from waterway users on the significance of social and resource indicators on a 5-point Likert scale from mattering "not at all" to mattering "extremely" in defining the quality of experience on the waterway. The list of proposed indicators posed to all users of waterway were compiled from a literature review and feedback from select resource management specialists. Social indicators to capture secluded backcountry travel and camping included among others "the number of boats I see along the waterway," "the number of large groups (more than 6 boats) that I see along the waterway," "the amount of noise associated with human activity along the waterway," and the number of groups camped within sight or sound of the campsite," and "the percent of time other people are seen while traveling on the waterway." Preferences for these certain indicators were also assessed in a separate set of questions by asking respondents for a preferred number within a given range, as well as for ranges of acceptability and unacceptability.

The waterway has such a diverse range of water-oriented opportunities, each defined by geographic features, accessibility, and use history, that we decided to compare users based upon travel zones within the area. In assessing visit and visitor characteristics we first chose to examine what differences emerged between the five groups defined by these travel zones. The first regional group is that which utilized only the upper lakes. The next is that which utilized only the lower lakes. The third is that which utilized only the upper river, a section typified by quick water and numerous, easy rapids. The fourth is that which utilized the entire, forty-mile river section, combining the quick water of the upper river with a more remote and placid lower section. The final group we defined as those users group who traveled on both lakes and river and stayed out for two or more nights. Visit and visitor characteristics were assessed for each of these groups separately and for the survey population as a whole. In addition, we compared the significance of social indicators among the different user groups.

## Results

For the onsite waterway user interviews, response rate was over 99 percent. Only a couple of the waterway users did not want to be interviewed. Of the 681 surveys mailed to waterway users, 31 were not deliverable due to incorrect addresses. Part of this return figure can be attributed to the fact that the Province of New Brunswick was in the process of adopting a 'civic numbering' plan (Stacey & Daigle, 2000). A total of 404 completed surveys were returned with 220 coming from US users, 181 from Canadian users, and three from other countries for an overall response rate of 62 percent. The majority of the survey respondents were male (80%). The vast majority of

Canadian users were from the province of New Brunswick (94%). The origins of US users were more diverse, but 73 percent were from the New England states of Maine, Massachusetts, Rhode Island, Vermont, Connecticut and New Hampshire. Of the Canadian respondents, only 32 percent were first time users of the waterway and 48 percent of the US respondents were first time users. Of those who have used the waterway previously, approximately 49 percent reported using it between one and 20 times, 29 percent between 21 and 100 times and 22 percent over 100 times.

#### Visit and Visitor Characteristics

The segmentation of users based upon travel areas within the St. Croix waterway included the upper lakes (n=154), lower lakes (n=38), upper river (n=107), full river (n=57), and extended trippers (n=35). Thirteen users were not part of this classification scheme because of insufficient travel data. Approximately equal proportions of Canadian and US visitors utilized the upper lake region of the St. Croix Waterway (Table 1). Slightly more Canadians utilized the lower lakes (63 percent) and upper river (59 percent) areas. However, US visitors were much more likely to be full

river users (89 percent) and extended trippers using both lakes and the river (94 percent). Much more day use was reported by users of only lower lakes (76 percent) as compared to the users of only upper lakes (41 percent). Most overnights in the upper lakes stayed 2 or more nights (66 percent). As might be expected, users of the full river and extended trippers were more likely to utilize the waterway for extended overnight stays. The two lake groups tend to be more oriented toward motorized use and fishing, with the lower lake group strongly focused on a day-fishing experience. Boat type and primary activity indicate that the upper lakes group is less homogenous than the lower lakes group. On the river sections parties tend to be larger, with more boats. The latter two of these river groups, the two groups that stayed the longest, are also distinctly American in composition. One of the most striking differences between these river groups is in their previous experience with the waterway, with less than 1% of the upper river group visiting for the first time, compared to 65% and 49% for the other two river groups. The two lake groups also have very high levels of previous experience with the waterway compared to all the river groups. Finally, each group also differs from the survey average represented by the overall results.

**Table 1. Trends in Visit and Visitor Characteristics**

	Waterway user groups					
	Upper Lakes (n=154)	Lower Lakes (n=38)	Upper River (n=107)	Full River (n=57)	Extended Trip (n=35)	All Responses (n=404)
Citizenship	53% Can.	63% Can.	59% Can.	89% US	94% US	45% Can.
Percent day use	41%	76%	21%	0%	0%	29%
Typical overnight stay	66% ≥ 2 nights	1 night	38% 1 night 54% 2-3 nights	95% 2-4 nights	74% 4-6 nights	17% 1 night 27% 2 nights 24% 3 nights
Boat type	46% Motor 30% Canoe	45% Motor 45% Other	87% Canoe	100% Canoe	100% Canoe	58% Canoe 27% Motor
Primary activity	31% Fishing 18% Camp 16% Canoe	92% Fishing	64% Canoe 11% Fishing	79% Canoe	63% Canoe	42% Canoe 26% Fishing 10% Camp
Group size (median)	3	2	7	6	7	3.5
Number of boats (median)	1	1	2	3	3	1
First visit	10%	27%	<1%	65%	49%	26%
Number of years visiting area since first visit (mean)	24.4	19.0	12.7	8.3	7.7	18.6

**Significance of Indicators for Secluded Travel and Camping**

Table 2 shows the relative influence of 4 potential indicators on the quality of visitor experiences related to secluded travel and camping. The five waterway user groups are again easily distinguished when considering potential indicators of secluded travel and camping. Table 2 shows that for all four questions the lower lakes group responded with the lowest ratings. In no category does the mean response reach even a "matters moderately" level for this group. Conversely, the full river and extended trip groups have significantly higher rankings than the other three groups for these indicators. For all four indicators these two groups responded with averages of "matters very much" or "matters extremely." Again, each group responds in a distinct way from the overall survey results.

We should note that two other indicators ranked higher than the above items for potential indicators of secluded travel and camping. For example, indicators such as "the amount of manmade noise originating away from the waterway" and "the amount of noise associated with human activity along the waterway" were rated as being more important as factors effecting experience quality as compared to number of other users seen on the waterway. These items were consistently ranked higher regardless of the waterway user group and the full river and extended trippers were especially sensitive to noise.

**Preferences for Solitude**

When respondents were asked to indicate a preferred condition for these potential indicators of secluded travel

and camping, the same trends appear. Table 3 shows that on the most densely used section of the waterway, the upper river, respondents have the highest preferred levels for number of boats seen in a day and number of large groups seen in a day. The lower lakes group, predominantly day-use fishers, had the highest preferences for number of groups camped within sight or sound and percent time other people are in sight. Not surprisingly, the lower lakes group also placed very low importance on these two categories as factors influencing experience quality. The two lake groups and the two lower river groups share similar preferences for the number of large groups seen in one day, but the latter have a strong preference for camping away from other groups.

The preferred condition can be useful to identify a proximate standard to describe central tendencies and to determine group norms for visitor acceptance of social impacts for indicators of experience quality. However, more analyses are required to investigate appropriate standards for example, "norm prevalence" (Kim & Shelby, 1998). Of particular importance is the relative significance of the potential indicators that helps define the quality of visitor experience. For certain user groups such as the upper and lower lakes as well as upper river users it might do little good to monitor preferences for conditions if these indicators are not as important as compared to other indicators in defining the quality of the visitor experience. A challenge is posed when for certain user groups, for example, extended trippers, where this indicator is important and travel zone areas overlap by the very nature of the activity.

**Table 2. Significance of Potential Experience Indicators on Secluded Waterway Travel and Camping**

This matters to me	Waterway user groups <sup>a</sup>					All Responses (n=404)
	Upper Lakes (n=154)	Lower Lakes (n=38)	Upper River (n=107)	Full River (n=57)	Extended Trip (n=35)	
The total number of boats I see along the waterway	2.84	2.39	2.78	3.56	3.47	2.94
The number of large groups (more than 6 boats) that I see along the waterway	2.86	2.49	2.79	3.65	3.64	2.99
The number of other groups that camp within sound of my campsite	3.04	2.18	3.07	4.04	4.03	3.22
The percent of time other people are in sight while I am boating along the waterway	2.50	2.00	2.70	3.51	3.51	2.73

<sup>a</sup> Mean answers on a 5-point Likert scale: 1=matters not at all, 2=matters slightly, 3=matters moderately, 4=matters very much, 5=matters extremely.

**Table 3. Preferences for Conditions Related to Secluded Travel and Camping on the St. Croix Waterway**

Indicator (range)	Waterway user groups <sup>a</sup>					All Responses n=404
	Upper Lakes (n=154)	Lower Lakes (n=38)	Upper River (n=107)	Full River (n=57)	Extended Trip (n=35)	
# Boats seen/day (0-50)	10	11	15	5	7.5	10
# Large groups seen/day (0-25)	3	3	5	2	3	3
# Groups camped nearby (0-25)	3	4	3	1	0	2
% Time see other people (0-100)	20	30	20	10	10	20

<sup>a</sup> Median responses for waterway user groups.

### Management Implications

In designing experience-based management plans, resource managers must strive to protect the resource and the experience without unnecessarily restrictive or heavy-handed techniques. To apply a single management scheme to an area with a complex geography and pattern of visitation will ultimately fail on both these counts. Some groups will be restricted unnecessarily and others will suffer from a diminished experience. The results of this research highlight the importance of conducting baseline investigations of use and user characteristics.

As use levels increase, recreation management planning will be necessary to provide and protect the diverse experiences desired by the St. Croix visitor population. This study demonstrates that opportunities for secluded travel and camping influence experience quality for most visitors to the waterway and are very influential for certain visitors, especially for those visitors who are traveling the waterway on extended canoe trips. As such it may be a key component of planning, along with other factors which were also ranked highly such as litter, campsite condition, visibility of forestry operations from the water, and water levels.

The multiplicity of visitor groups, each with unique standards, seems at first as though it could lead to conflicts between visitors. However, the geographic zones of the waterway provide a management opportunity for offering a diversity of experiences. For example, visitors to the mostly flat water portion of the river have the most restrictive standards for solitude, therefore this region could be zoned in such a way to protect this opportunity without unnecessarily restricting visitors to the upper or lower lakes or upper river. Outreach efforts to achieve this goal might be best focused on the American visitor population, since

this group is predominantly from the US. Efforts aimed at enhancing the lower lakes visitor experience should focus on improving the quality of day-oriented fishing excursions. The upper lakes, with the most diverse visitor population, might benefit from campsite types that range from primitive to developed, with certain islands or shoreline sections designated similarly. Presently, the large area of these lakes allows for diverse recreation opportunities without significant conflict.

The upper river is the area which suggests the greatest potential for conflict. Three groups utilize this zone, the upper river group, the full river travelers and the extended trip group. The upper river section could easily be traveled in a long single day. However, more than one half of the upper river group stayed 2 or more nights. This relatively slow rate of travel could perhaps lead to congestion of the limited number of sites in this zone. Also, this group has different standards regarding solitude from the other two groups. A preliminary analysis of other survey questions related to motivation, however, suggests more commonality. Approximately one quarter of the upper river group indicated the primary reason was to spend time with companions as compared to 10 percent for other river groups. However, the majority of all river groups indicated the primary reason they chose the St. Croix waterway was to engage in specific outdoor activities, especially canoeing, fishing and camping.

### References

- Dillman, D. A. (1983). *Mail and telephone surveys*. New York: John Wiley and Sons.
- Kim, S., & Shelby, B. (1998). Norms for behavior and conditions in two national park campgrounds in Korea. *Environmental Management*, 22, 277-85.

Lucas, R. C., & Stankey, G. H. (1985). Role of research in applying the limits of acceptable change system. In A. E. Watson (Ed.), Proceedings: Southeastern Recreation Research Conference (pp. 1-15). Statesboro: Georgia Southern College, Department of Recreation and Leisure Services.

Manning, R. E. (1999). Studies in outdoor recreation: Search and research for satisfaction (2<sup>nd</sup> ed.). Corvallis: Oregon State University Press.

Stacey, C., & Daigle, J. J. (2000). Recreational use assessment of the St. Croix International Waterway: An overview of recreational user characteristics and perspectives. Orono: Department of Forest Management, University of Maine.

SCIWC. (1993). St. Croix International Waterway: A heritage – a future. Plan for the long-term cooperative management of the St. Croix International Waterway. St. Stephen, New Brunswick: St. Croix International Waterway Commission.

Watson, A. E., Williams, D. R., Roggenbuck, J. W., & Daigle, J. J. (1992). Visitor characteristics and preferences for three National Forest Wildernesses in the South (Res. Pap. INT-455). Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station.

Watson, A. E., Hunger, D., Christensen, N., Spildie, Becker, K., & Comstock, J. (1998). Wilderness boaters: Protecting unique opportunities in the Frank Church-River of No Return Wilderness, Idaho, U.S.A. In A. E. Watson, G. H. Aplet, & J. C. Hendee (Comps.), Personal, Societal, and Ecological Values of Wilderness: Sixth World Wilderness Congress Proceedings on Research, Management, and Allocation, Vol. I (RMRS-P-4, pp. 151-158). Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

## SECURITY ALONG THE APPALACHIAN TRAIL

James J. Bacon, Robert E. Manning

University of Vermont

Alan R. Graefe, Gerard Kyle, Robert D. Lee

Penn State University

Robert C. Burns

University of Florida

Rita Hennessy, Robert Gray

National Park Service

---

**Abstract:** The Appalachian National Scenic Trail (AT) is a public footpath that spans more than 2,000 miles of Appalachian Mountain ridgelines. It stretches from Mount Katahdin in Maine to Springer Mountain in Georgia and passes through twelve other states along the way. It is estimated that the AT lies within a day's drive of over half the country's population. Thus, the AT is in close proximity to some of our nation's most densely populated areas.

Security along the trail has emerged as an important topic for trail managers, at least partially in response to recent high-profile crimes on or near the trail. How safe do visitors feel on the AT? It is a goal of trail managers to provide a safe and secure environment in which visitors can enjoy the natural, scenic, historic, cultural and recreational resources of the Appalachian Mountains. In order to assess the issue of security, managers need to be informed as to what types of security issues are arising, where they occur, and how visitors perceive the issue of security.

A wide-ranging study of visitors to the AT was conducted in the summer and fall of 1999 and included a number of questions about security. Security questions addressed the number and type of incidents encountered, preventative behaviors, and visitor's perceptions of security on and adjacent to the trail. This study presents descriptive findings from these questions and an analysis of the relationships between security and selected independent variables, including respondent gender, age, experience, and race/ethnicity, type of hiker, and location along the trail.

**Key Words:** Security, Outdoor Recreation, Appalachian Trail

---

### Introduction

Recent high-profile crimes in national parks and related areas have contributed to a heightened awareness of and concern for security in parks and outdoor recreation areas. In 1996 a double homicide occurred near the Appalachian Trail (AT): two women were killed near their campsite in

Shenandoah National Park (New York Times, 1996). Similarly, a series of homicides occurred in Yosemite National Park in 1999 and a National Park Service ranger was killed in Honokohau National Historical Park that same year (USA Today, 2000; NPS, 2001). These are only a few examples of violent crime in outdoor recreation settings. While these incidents may be isolated occurrences, they raise the question of how secure visitors feel in parks and related areas.

Outdoor recreation areas serve a distinct function in our society. They are the places we play, enjoy the natural world, and re-create ourselves. They give us the chance to withdraw from society and its problems, if only for a short time. However, incidents like the murders near the AT and in Yosemite give us a stark reminder of the realities of our contemporary world. National parks and related areas are not divorced from the security issues that trouble the rest of society. One of the principle values of these areas is the opportunity they present for escape from daily routines and pressures, and when crimes occur, there is a resonating impact on the recreating public. To what degree is security a problem in parks and related areas? How do crime and security issues affect recreationists? How safe do visitors feel in outdoor recreation settings?

A wide-ranging study of visitors to the AT was conducted in the summer and fall of 1999. The study included several questions about security. Questions addressed the number and type of security incidents encountered, preventative behaviors, and visitors' perceptions of security on and adjacent to the trail. This paper presents descriptive findings from these questions and an analysis of security on the AT in relation to several study variables, including age, gender, race/ethnicity, location, hiker type, experience, and group size.

### Security Issues in Outdoor Recreation

Security can have multiple meanings and connotations in a recreation setting. For instance, security may refer to feelings of safety when the possibility of encountering wildlife such as a bear or mountain lion is present. The same can be said for feelings toward inclement weather or other adverse conditions in the recreation setting. Security can also be defined by users' own experience level in a particular activity and whether they are undertaking an activity that is beyond their skill level and therefore produces feelings of discomfort or insecurity. Finally, security can refer to feelings or perceptions of threat from other people. This latter definition was used for the purposes of this study. Respondents were given the following definition of security in the study questionnaire, "Security refers to feeling free from being threatened or attacked by other people on the trail." This paper focuses on security issues along the AT from this perspective.

The issue of security in outdoor recreation can be complex. The types of incidents that take place in outdoor recreation settings are continually diversifying. It is becoming increasingly apparent that parks, forests, and related areas are not devoid of the security problems that exist in society at large. Often the types of security issues that arise in

outdoor recreation settings are identified with urban problems. Chavez and Tynon (2000) identified several categories of criminal activities that take place on areas administered by the US Forest Service in the West, including one category entitled *urban-associated crime*. One common hypothesis is that criminal activity is more prevalent in front-country or urban settings. The thought is that urban problems "spill over" into adjacent recreation settings. However, outdoor recreation settings present a specific context for security issues, and it has been suggested that security in parks and recreation receive more explicit and comprehensive attention (Pendleton, 2000).

Security issues can have a dramatic effect on the visitor experience. For example, Fletcher (1983) found that perceptions of security problems negatively affect visitors' enjoyment of parks. Additionally, a pilot study conducted by Burns and associates (2000) on the AT and several Army Corp of Engineers lakes focused on visitors' perceptions of security and found that perceptions of security varied with visitor characteristics and recreation setting. These studies represent recent attempts to address this issue. Historically, however, little research has been done specifically on the issues surrounding crime and security in outdoor recreation settings. As recreation managers endeavor to provide a safe environment in which visitors may enjoy the out-of-doors and provide quality experiences, it becomes increasingly important to understand how visitors perceive of security in these settings. Clearly, an encounter with a security problem can substantially affect the visitor experience. Initial research suggests that perceived security problems may even displace visitors from parks and related areas (Fletcher, 1983; Burns et al., 2000).

### **Security on the AT**

The AT is a vast and unusual recreation resource. It spans more than 2,000 miles of Appalachian Mountain ridgelines along the eastern third of the United States. It is estimated that over half of the country's population lives within a day's drive of the AT. Thus, the AT is in close proximity to some of our nation's most populated areas. Due in part to recent high-profile crimes on and near the Trail and its proximity to densely populated areas, security issues have increasingly become a concern of trail managers. It is a goal of trail managers and planners to provide a safe and secure environment in which visitors may enjoy the natural, scenic, historic, cultural, and recreational resources of the Appalachian Mountains. In order to meet this objective, managers and planners need to be informed about specific security issues along the AT. Further, if they are to effectively and efficiently address security concerns on the AT, managers will need to be knowledgeable about the frequency, types, and locations of security issues along the trail, and visitor perceptions of trail security.

The AT is also quite unusual in terms of its administration and management. The AT is jointly maintained by volunteer hiking clubs, the US Forest Service and the National Park Service. Such a coordinated effort presents challenges for trail management (Burns et al., 2000). The

trail passes through a myriad of jurisdictions ranging from local municipalities to state and federal agencies. Similarly, the trail passes through a wide range of natural landscapes from remote highlands to the roadsides of local communities. Additionally, there are a multitude of access points along the vast expanse of the trail. These characteristics present further challenges to the effective management of security issues.

### **Study Methods**

The primary study method consisted of a survey of randomly selected users along the AT. Sampling took place in the summer and fall of 1999 (84% of the sample was obtained in the summer and the remaining 14% in the fall). Subjects were approached and asked if they would be willing to complete a mail-back questionnaire. A total of 2,847 AT users agreed to participate in the survey and were mailed a questionnaire. Four mailings were sent out; an initial mailing (a questionnaire, a cover letter, and a postage-paid, pre-addressed return envelope), a postcard reminder, a follow-up questionnaire and a final mailing to non-respondents. Nearly 2,000 questionnaires were completed and returned, representing a response rate of 66 percent. The sample was designed to be as representative as possible of all users of the AT over 18 years of age.

For purposes of management, the AT is divided into four geographic regions - New England, Mid-Atlantic, Southwest Virginia, and the Deep South. Four types of visitors were defined in the study population, 1) day users (respondents who reported being "on the trail for one day only", 2) overnight visitors (respondents who reported being "out for more than one day", 3) section hikers (respondents who reported "hiking sections of the Appalachian Trail with the intent of hiking the entire trail over an extended period of time"), and 4) thru hikers (respondents who were "hiking the entire AT in a calendar year"). Thru hikers were purposively sampled to ensure an adequate sample size. Thus, while study data are designed to be representative of thru hikers, thru hikers do not represent as large a proportion of AT visitors as suggested in the tables. Study data are analyzed across the four regions of the trail and the four types of hikers.

### **Study Findings**

#### Visitor Perceptions of Security on the AT

Respondents were first asked about their perceptions of security. Again, security was defined for respondents as "feeling free from being threatened or attacked by other people on the trail". Security ratings were based on a four-point Likert scale ranging from "Very secure" to "Very insecure". Visitors were asked to rate their perceptions of security at two locations: while on the AT and while leaving the AT (e.g., to go into surrounding towns). The majority of all AT users felt "very" or "reasonably" secure while on the trail (Table 1). However, feelings of security tended to decline when leaving the trail, especially for section and thru hikers. There were no significant regional differences in the responses to this question.

**Table 1. Visitor Perceived Security**

<b>While you were out on the AT</b>					
	<b>Day user</b>	<b>Overnight</b>	<b>Section hiker</b>	<b>Thru hiker</b>	<b>Total</b>
	<i>Percentages</i>				
Very Secure	67.8	64.2	58.8	74.5	66.5
Reasonably Secure	30.6	33.6	38.8	24.2	31.7
Somewhat Insecure	1.3	2.0	2.3	1.3	1.6
Very Insecure	0.3	0.2	0	0	0.2
<b>While leaving the AT (e.g., to go into surrounding towns)</b>					
	<b>Day user</b>	<b>Overnight</b>	<b>Section hiker</b>	<b>Thru hiker</b>	<b>Total</b>
	<i>Percentages</i>				
Very Secure	64.8	55.9	34.0	26.6	50.3
Reasonably Secure	33.8	40.0	60.9	67.3	46.0
Somewhat Insecure	1.2	4.0	4.3	6.1	3.4
Very Insecure	0.2	0.2	0.8	0	0.2

The next question asked respondents to rate their level of satisfaction with security at trailheads and parking lots, and with assistance from rangers, ridge runners and volunteers. Again, this question had a four-point response ranging from "Very satisfied" to "Very unsatisfied". Most AT visitors were "reasonably satisfied" with the level of security at trailheads and parking lots (Table 2). However, most visitors were "very satisfied" with the level of assistance from rangers, ridge runners, and volunteers along the AT. These findings were generally consistent across hiker types and geographic/administrative divisions.

**Number and Types of Security Problems on the AT**

The next set of security questions addressed the number and types of security problems encountered. Again, a

distinction was made between two locations, along the trail and at trailheads, parking lots or within a few miles of the trail. Respondents were asked whether they encountered a security problem on or near the trail in the last 12 months, whether the incident involved a personal threat or attack, or vandalism or theft of personal property, and was the incident reported to authorities. A final open-ended question asked respondents to briefly describe any security problems experienced. Study findings are reported in Tables 3 and 4.

Only a small minority of all types of hikers reported experiencing a security problem on the trail in the past 12 months. Section and especially thru-hikers were more likely to have experienced a security problem, probably because they spend considerably more time on the trail.

**Table 2. Satisfaction with Level of Security and Assistance**

<b>Level of security at trailheads and parking lots</b>					
	<b>Day user</b>	<b>Overnight</b>	<b>Section hiker</b>	<b>Thru hiker</b>	<b>Total</b>
	<i>Percentages</i>				
Very Satisfied	35.7	36.3	27.7	29.1	33.6
Reasonably Satisfied	56.4	55.4	60.2	59.9	57.3
Somewhat Unsatisfied	6.9	7.7	9.6	9.7	8.1
Very Unsatisfied	1	0.6	2.4	1.4	1.1
<b>Level of assistance from rangers, ridge runners, and volunteers along the AT</b>					
	<b>Day user</b>	<b>Overnight</b>	<b>Section hiker</b>	<b>Thru hiker</b>	<b>Total</b>
	<i>Percentages</i>				
Very Satisfied	56.7	68.9	60.2	46.2	59.3
Reasonably Satisfied	35.9	29.6	33.3	48.2	35.7
Somewhat Unsatisfied	5.4	0.9	5.6	4.6	3.8
Very Unsatisfied	1.9	0.6	0.8	1	1.1

**Table 3. Security Problems along the Trail in Last Twelve Months**

<b>Security problem along the trail in last 12 months</b>					
	<b>Day user</b>	<b>Overnight</b>	<b>Section hiker</b>	<b>Thru hikers</b>	<b>Total</b>
	<i>Percentages</i>				
<b>Yes</b>	2.2	1.4	4.2	13.7	4.3
<b>No</b>	97.8	98.6	95.8	86.3	95.7
<b>Did incident involve personal threat or attack</b>					
	<i>Percentages</i>				
<b>Yes</b>	10.0	6.7	33.3	14.6	15.8
<b>No</b>	90.0	93.3	66.7	85.4	84.2
<b>Did incident involve vandalism or theft of personal property</b>					
	<i>Percentages</i>				
<b>Yes</b>	5.0	7.1	10.5	27.7	17.0
<b>No</b>	95.0	92.9	89.5	72.3	83.0
<b>Was the incident reported to law enforcement authorities</b>					
	<i>Percentages</i>				
<b>Yes</b>	10.5	20.0	23.5	37.8	27.5
<b>No</b>	89.5	80.0	76.5	62.2	72.5

**Table 4. Security Problems at Trailheads, Parking Lots and Near Trail in Last Twelve Months**

<b>Security problem at a trailhead or parking lot or within a few miles of the trail in last 12 months</b>					
	<b>Day user</b>	<b>Overnight</b>	<b>Section hiker</b>	<b>Thru hiker</b>	<b>Total</b>
	<i>Percentages</i>				
<b>Yes</b>	1.6	3.1	5.3	9.4	4.0
<b>No</b>	98.4	96.9	94.7	90.6	96.0
<b>Did incident involve personal threat or attack</b>					
	<i>Percentages</i>				
<b>Yes</b>	7.1	5.3	10.5	10.3	8.6
<b>No</b>	92.9	94.7	89.5	89.7	91.4
<b>Did incident involve vandalism or theft of personal property</b>					
	<i>Percentages</i>				
<b>Yes</b>	23.1	47.1	27.8	17.2	27.3
<b>No</b>	76.9	52.9	72.2	82.8	72.7
<b>Was the incident reported to law enforcement authorities</b>					
	<i>Percentages</i>				
<b>Yes</b>	41.7	70.6	41.7	50.0	52.2
<b>No</b>	58.3	29.4	58.3	50.0	47.8

Only a very small minority of security problems experienced involved a personal threat or attack. The vast majority of respondents did not report the security problem they experienced to law enforcement authorities. The number and types of security problems experienced at trailheads, parking lots or within a few miles of the trail were generally similar to those experienced on the trail. However, visitors tended to report these security problems to law enforcement authorities more often.

While the percentage of all visitors to the AT who experienced security problems may be relatively low (approximately 4%), the absolute number of all visitors to the trail who experience such problems may be relatively high, perhaps startling so. While there are no official counts of the number of visitors to the AT (such counts would be inherently difficult to conduct), the National Park Service estimates that the trail accommodates at least three million visits per year. Even if only a very small

percentage of visitors report a security incident, this represents a potentially large number of such incidents per year!

Most respondents' open-ended descriptions of security incidents can be grouped into three general categories: (1) vandalism or theft of personal property (2) inappropriate behavior (i.e. partying, heckling, and sexual harassment) and (3) perceived risk or threat from others. Vandalism and theft of property tended to be more common at trailheads and parking lots and usually pertained to automobile break-ins. Inappropriate behavior tended to be most common on the trail or in camp. Examples of this problem include loud parties nearby or illegal activities such as horseback riding and hunting. Examples of perceived risk or threat from others include encountering people acting "strangely" and people who were inebriated.

#### Visitor Behavior

A final security question concerned visitor behavior in response to security problems. Respondents were asked whether they intentionally hike or camp near other people for reasons of safety or personal security. If they answered positively they were asked to explain in an open-ended format. Most AT users do not hike or camp near other people for reasons of safety or personal security (Table 5). However thru hikers are much more likely to do so than other hikers.

Explanations for this behavior were diverse. Generally, many users hike or camp near others as a precautionary measure. A common theme along this vein is the motto "safety in numbers". Still others were inclined to adopt this behavior as a result of specific encounters with others. AT users who did adopt this behavior tended to do so when camping more than hiking.

#### Demographic Analysis

As mentioned earlier, the questions about security were part of a larger, wide-ranging study of use and users of the AT. Respondents were queried about several variables including various demographic questions. Data were analyzed to explore for statistically significant associations between responses to security questions and other independent variables. These included gender, age, race/ethnicity, group size and type, backcountry experience, and place of residence (e.g. rural or urban). Very few significant relationships were found as a result of this analysis. Of the variables tested, gender had the most significant affect on responses to security questions (Table 6). For example, women were more likely to encounter a security problem involving personal threat or attack, were far less likely to report incidents to law enforcement authorities, and were twice as likely to hike or camp near other people for reasons of safety or personal security.

**Table 5. Intentionally Hike or Camp for Safety or Security**

	Day user	Overnight	Section hiker	Thru hiker	Total
Yes	13.1	13.7	22.5	40.6	19.8
No	86.9	86.3	77.5	59.4	80.2

**Table 6. Relationship between Security on the AT and Gender**

<b>Did the incident involve a personal threat or attack against you? (N=82; Chi<sup>2</sup>=5.53; p=0.02)</b>			
	Female	Male	Total
<i>Percentages</i>			
Yes	22.2	4.7	8.5
No	77.8	95.3	91.5
<b>Was the incident reported to law enforcement authorities? (N=67; Chi<sup>2</sup>=4.15; p=0.04)</b>			
<i>Percentages</i>			
Yes	29.4	58.0	50.7
No	70.6	42.0	49.3
<b>When travelling on the AT, do you ever intentionally hike or camp near other people for reasons of safety or personal security? (N=1642; Chi<sup>2</sup>=43.34; p=0.00)</b>			
<i>Percentages</i>			
Yes	29.9	15.6	19.6
No	70.1	84.4	80.4

Other variables with significant associations to security questions include group size and type, level of backcountry experience, and type of place currently living in (Table 7). Visitors who were hiking alone felt less secure while leaving the trail than visitors hiking with family, friends, or other types of groups. Similarly, moderate association was found between group size and whether the respondent hiked or camped near others for reasons of security. As group size increased respondents were less likely to adopt such behavior. Likewise, the more backcountry experience a respondent reported having, the less likely they were to hike or camp near others. Finally, visitors who currently live in a medium city or major metropolitan area were slightly more apt to hike or camp near others for reasons of security than respondents from more rural or suburban areas.

### Conclusions and Implications

Security issues on the Appalachian Trail affect visitors in varying ways. While the vast majority of visitors do not personally experience security problems on the AT, many visitors do not feel fully secure and often seek out the safety of others. Moreover, this study includes only visitors to the trail. Not included in the sample are people who were fearful enough for their security that they did not hike the trail at all. To what extent this is occurring is uncertain. Nevertheless, we have a sample of visitors who

expected to be relatively safe. Further, it should be noted that data from this study reflect visitor reports and perceptions of security issues on the AT. This may not necessarily reflect the full extent of actual security issues. For example, Tynon and Chavez (2000) surveyed a selected group of resource managers and law enforcement personnel from areas managed by the US Forest Service in the West and found that many crimes that take place in these areas are not reported to the public. One law enforcement officer stated, "if the general public had any idea, they would not go out there." These are powerful words that suggest that visitor and manager perceptions of security issues in outdoor recreation settings may be at odds. Given the length and diverse character of the AT, it may be useful to re-examine the findings reported here with information obtained from other sources as reported by managers, park rangers, volunteers and law enforcement authorities.

Is security a problem on the AT and, by extension, in parks and outdoor recreation more broadly? Inescapably, the answer appears to be "yes". While only a small minority of visitors in this study report encountering a security problem, the absolute number of visitors to the AT and the security incidents this represents may still be high, perhaps even shockingly so. Still more troubling is the degree to which perceived insecurity generated by such incidents – especially those that receive attention in the national news

**Table 7. Relationship between Security on the AT and Other Independent Variables**

<b>Hike or camp near others for security/ Number of people in group (N=1659; Chi<sup>2</sup>=42.33; p=0.00)</b>								
	1	2	3	4	5	More than 5	Total	
	(Percentages)							
Yes	26.9	19.4	14.3	12.5	10.2	14.6	19.6	
No	73.1	80.6	85.7	87.5	89.8	85.4	80.4	
<b>Security while leaving the trail/Type of group (N=1693; Chi<sup>2</sup>=44.02; p=0.00)</b>								
	Alone	Family	Friends	Family & Friends	Organized group	Commercial group	Other	Total
	(Percentages)							
Very Secure	39.9	53.6	53.9	62.7	58.8	66.7	40	50.4
Reasonably Secure	55.7	42.8	42.4	37.3	37.1	33.3	56.7	46
Somewhat Insecure	4.1	3.7	3.4	0	4.1	0	3.3	3.4
Very Insecure	0.4	0	0.4	0	0	0	0	0.2
<b>Hike or camp near others for security/Level of backcountry experience (N=1631; Chi<sup>2</sup>=10.21; p=0.04)</b>								
	Novice	Intermediate	Skilled	Advanced	Expert	Total		
	(Percentages)							
Yes	12.8	15.1	19.3	22.3	20.3	19.6		
No	87.2	84.9	80.7	77.7	79.7	80.4		
<b>Hike or camp near others for security/ Type of place currently living in (N=1645; Chi<sup>2</sup>=8.09; p=0.15)</b>								
	On a Farm or Ranch	Rural or Small Town	Town	Small City	Medium City	Major City or Metropolitan Area	Total	
	(Percentages)							
Yes	14.3	13.8	18.7	19.2	21.4	23.2	19.4	
No	85.7	86.2	81.3	80.8	78.6	76.8	80.6	

media – ripples through the population of trail users. Incipient doubts about personal security seem to have crept into the minds of many trail users, even to the point of seeking the safety of others while hiking and camping.

To be fair, the data reported in this study should be considered within a broader context. Clearly, crime rates are substantially higher in population centers than they are in parks and related outdoor recreation areas. In the words of one of our study respondents, "I go to get away from people. If I wanted to feel insecure, I would stay at home." However, as our study indicates, crime on the AT, and probably in other parks and recreation areas as well, is substantially underreported. And in the words of another respondent, "You just never know".

What should park and recreation managers do about problems of visitor security? Perhaps a first step is to assess and monitor the nature and extent of the problem through studies like the one described here. If security is found to be a significant problem, then management action is warranted. More focus on law enforcement may be called for, especially in the event of serious criminal activity or threats to visitor safety. However, in large parks and dispersed outdoor recreation areas such as the AT, there are obvious limits to the effectiveness of this approach, and it may even be inappropriate if carried to an extreme. Perhaps a more effective approach is to communicate clearly and deliberately with visitors, including an objective assessment of security issues, suggested guidelines for ensuring a safe visit, and encouraging visitors to report security problems encountered. The Appalachian Trail Conference, the organizing body for hiking organizations that manage the AT, has developed such guidelines that are posted on its website. These guidelines may serve as a model for other park and recreation managers.

Information about the number and types of security issues occurring in recreation settings should be an integral part of resource management. Additional research is needed to obtain more detailed information on the number and types of security problems experienced by visitors, how perceptions of security affect visitor behavior and experiences, the most effective and efficient methods for dealing with security issues in outdoor recreation settings, and how these practices might impact visitors.

## Literature Cited

Burns, R. C., Lee, R. D., & Graefe, A. R. (2000). Visitor perceptions of personal security and crime at outdoor recreation areas: Contemporary issues at US Army Corps of Engineers lakes and along the Appalachian Trail. In G. Kyle (Comp., Ed.), Proceedings of the 1999 Northeastern Recreation Research Symposium (Gen. Tech. Rep. NE-269, pp. 186-189). Newtown Square, PA: USDA, Forest Service, Northeastern Research Station.

Chavez, D. J., & Tynon, J. F. (2000). Triage law enforcement: Societal impacts on national forests in the West. Environmental Management, 26(4), 403-407.

Chavez, D. J., & Tynon, J. F. (2000). Urban crimes in natural environments: Are we prepared? In Proceedings of the 3<sup>rd</sup> Social Aspects and Recreation Research Symposium.

Fletcher, J. E. (1983). Assessing the impact of actual and perceived safety and security problems on park use and enjoyment. Journal of Park and Recreation Administration.

Killings defile sanctuary of nation's remote trails. (1996, June 10). New York Times.

National Park Service (2000). Suspect arrested in murder of park ranger, Press Release: <http://165.83.219.72/release/Detail.cfm?ID=8> (Accessed January 25, 2001).

Pendleton, M. R. (2000). Leisure, crime and cops: Exploring a paradox of our civility. Journal of Leisure Research, 32(1), 111-115.

Pendleton, M. R. (1998). Policing the park: Understanding soft enforcement. Journal of Leisure Research, 30(4), 552.

USA Today (2000) Campers wary after Yosemite slayings. ONLINE: <http://www.usatoday.com/life/travel/lt122.htm> (Accessed October 31, 2000).

## TRAILS RESEARCH: WHERE DO WE GO FROM HERE?

Michael A. Schuett

Associate Professor, Recreation Parks and Tourism Resources Program, Division of Forestry, West Virginia University, Morgantown, WV 26506

Patricia Seiser

Doctoral Candidate, Recreation Parks and Tourism Resources Program, Division of Forestry, West Virginia University, Morgantown, WV 26506

---

**Abstract:** This paper describes a recent study focusing on trails research needs. This study was supported by American Trails. Using a Delphi technique, 86 trails experts representing a variety of federal, state and local agencies, nonprofits, and trail uses were queried by email on trails research needs. A Delphi technique is a prognostic tool for dealing with complex problems or issues. The project took place in three phases: Initially, individuals were chosen to participate in the study (expert panel) and respond on the type of trails research that is needed for the future. More than 200 comments were returned covering a plethora of topics, i.e., assessing physical impacts to establishing a national information clearinghouse to trail design. This information was analyzed using content analysis. Secondly, a list of 65 trails research items was sent back to the panel to be rated by level of importance, 1=Not at all Important, 10=Extremely Important. Response rate was 87% (n=75). Thirdly, after these responses were entered and scored, they were sent to the panel for final review and commentary. An overview of the findings show that the panelists rated several trails research needs as very important including values of trails to the community, economic impacts, and trail usage and demand. Results will be highlighted along with a discussion on the topics of research funding, information dissemination, and a national agenda for trails research.

---

### Introduction

The body of literature on trails has largely been concentrated in several general areas including: trail users, (motorized, mountain bikers), benefits (personal, economic), management (training, type of use), construction and maintenance (bridge building, erosion prevention) and planning (public involvement, standards). In examining this growing body of literature in more detail, it has some limitations, because it is agency specific, lacks rigor, tends to be parochial, and often times, the actual studies can be very difficult to obtain (Schuett & Seiser, 2000). In examining the literature specifically on *trails research*, a few studies have been done by specific agencies concerning their own types of trails and needs. For example, in 1996, the National Park Service compiled a list of suggestions for trails-related research. The topics that were put together by managers focused on design, layout, construction, use patterns and facilities. In the fall of 1999, the Interagency Trails Council, spearheaded by the

Bureau of Land Management, conducted a needs assessment to examine trail training needs and opportunities (Bureau of Land Management, 2000). As a result of this needs assessment, the National Trail Training Partnership (NTTP) was formed to address specific tasks that were identified on trail training programs, courses and information dissemination. However, the trails research information that is available is limited and has not been conducted across all parties involved including federal, state, local managers, users, and trails groups.

### Purpose

The purpose of this study was to obtain information from trails experts in the field about the types of trails research that is needed for managers. This research was based on two pilot studies conducted at conferences in 1998, one at the National Trails Symposium and the other, the National Association of Recreation Resource Planners.

### Method

This study used a Delphi technique to obtain the information on trails research from trails experts. The Delphi technique is a consensus-building tool used for futures research (Dalkey, 1969). This technique is a method of forecasting based upon the collective opinion of knowledgeable experts using several rounds of information gathering. The Delphi has been popular forecasting method since its inception in the mid 1950s and was been used in several areas in the recreation and parks literature (see Young & Jamieson, 2001 for a Delphi review). An overview of the Delphi process is as follows: a working problem is identified, individuals are selected who will be part of the Delphi panel, a pre-determined number agree to participate and the researcher uses multiple rounds of questionnaires to collect these data.

In this study, a first round questionnaire was used in an open-ended format to identify trails research needs. The panel chosen for inclusion in the study was made up of trails experts who were involved in a managerial or supervisory capacity with all types of trails and agencies. Names were obtained from a variety of sources including conference attendance lists, the trails literature, referrals, workshop organizers, academics, and personal knowledge from the researcher. Initially a list of 100 experts were contacted with a final list of 86 individuals agreeing to participate in the study.

Data were collected using an electronic survey, through the use of individual email addresses and a website. The electronic survey format was chosen for several reasons including time, efficient administration of the questionnaire, and ease of data entry. Three rounds of data collection was used in the Delphi process.

### Results

In the initial round, the panelists were asked to list trails research needs. Individuals obtained the questionnaire in two ways to facilitate the process, via email in the body of the

message or by access to a website using a password. Results from this round, yielded over 200 comments. These comments were then recorded, categorized using content analysis, and put together into a structured questionnaire for comment. These items were checked for reliability using outside experts. The questionnaire had a total of 65 trails research items representing several areas including benefits, management and impacts. In the second round, these items

were rated on an Importance scale from 1-10, 1= Not at All Important to 10=Extremely Important. The third round had respondents examine the final results giving comments as needed. Overall response rate was 87%, (n=75). The results of the top ten items in the Delphi process can be found in Table 1. The items that received the highest overall score (between 7-10) by at least 70% of the respondents are listed in Table 1.

**Table 1. Top Ten Research Needs**

Research Need	Percentage*
Values of the trail to the community	85
Economic impacts of a trail to local communities and adjacent landowners.	83
Trail usage and demand on local, state, regional, and national levels.	83
Affect of educational / informational programs on reducing user conflicts on multiple-use trail	79
Impacts of trail design, type, and use on natural resources (flora, fauna, and environment).	77
Assessment of adjacent property owners' perceptions of a trail.	77
Impacts of multiple use on trail user experiences.	76
Volunteer groups' trail maintenance and monitoring programs.	76
Health and quality of life impacts on trail users.	73
Implications of permitting additional forms of trail use (equestrian, trail bikes, etc.).	72

\* reflects items in the 7-10 range

### Discussion and Implications

The purpose of this study was to establish and obtain feedback from trails experts on research needs. The strength of the results lies in the varied backgrounds of those chosen for the study including trails in federal, state, and local areas. The findings are limited to those experts who decided to participate in the study and the items used in the Delphi process. Nonetheless some degree of generalization is appropriate given the fact that trails research priorities have limited availability on a national scale. It is clear that several of the items in the study emerged as important establishing some patterns to consider in future research. In highlighting some of the results, values of the trail to the community emerged as the most important item on the least. The value of a trail can be concrete measured through increased property values and economic impacts or more subjective as in place

attachment and benefits. This item although difficult to measure at times, is a powerful force for trail users and communities. More information is needed about how these values can be measured and determined. Specific types of values were also expressed as important including health and quality of life issues. Managers are clearly looking for more information about the personal values of trails to individuals and communities. Impacts, economic and physical, also surfaced as an important group of items. Economic impacts and property values are a continual concern for communities to justify trail creation, maintenance and construction. For many communities a new trail can add "life" to a community. More tangible outcomes, economic impacts outcomes are something concrete that can be measured and can be very helpful in trail creation and promotion. Several studies have outlined the economic impacts of trails (Moore & Barthlow, 1998) but obviously more are needed.

Considering the increased usage trails are experiencing now and in the future, (Cordell, 2001) along with new and varied uses (e.g., mountain bikes, motorized vehicles), more studies about physical impacts are also needed. This finding on resource impacts also relates to the need for more information about participation trends. Numerous agencies and states are collecting more pertinent information on participation patterns and trends as they incorporate these data in their trail plans. However, this type of data can be expensive, difficult to obtain and time consuming to collect and interpret.

It is clear that managers from a variety of areas representing many different types of trail users feel trails research is important and have specific needs. The needs are diverse, varying from demand trends to resource information. Yet the needs are there and a unified effort amongst the trails community needs to be considered in creating a research agenda. Funding issues can often be one of the reasons research is not done which is compounded by historically low budgets on a federal and state level. More partnerships need to be created with the public, private and third sector (nonprofits) in order to make more funds available for research. The availability of information can be problematic, too. The research that is being conducted is often times agency specific, lacks application or goes unpublished, and therefore may not be widely disseminated. Some information clearing houses have been set up by mostly by non profit trail groups on the Internet making current studies available, i.e., American Trails, National Off-Highway Vehicle Conservation Council, Inc., International Mountain Biking Association and South Carolina State Parks. A research agenda put forth by a national group such as American Trails or drafted as part of a Trails Summit should be put forth in conjunction with federal, state and local agencies and private industry. This is a topic that should be strongly considered for future Trails Symposia.

The dissemination of this research could also be improved by the creation of a journal more exclusively for trails. At the present time, trails research appears in a number of journals from recreation and parks to landscape architecture. None of these periodicals have the title of "trails journal" and one may need to be created and supported from a wide constituency. In this way the information could be made available to all types of managers from basic research to action research. In closing, as trails continue to become more important and intertwined into the fabric of our lives, more information will need to become available to address and improve the management, construction, demand, and impacts of trails everywhere.

## References

- Bureau of Land Management (2000). Interagency trails training needs assessment. Internal Report.
- Cordell, K. (2001). Outdoor recreation in American life: A national assessment of demand and supply trends. Champaign, IL: Sagamore Publishing.
- Dalkey, N. C. (1969). An experimental study of group opinion. Futures, 1, 408-426.
- Moore, R., & Barthlow, K. (1998). The economic impacts and uses of long-distance trails. Washington, DC: USDI National Park Service.
- Schuett, M. A., & Seiser, P. (2000, September). Trails research agenda: What do you want? Presented at the National Trails Symposium, Redding, CA.
- Young, S. J., & Jamieson, L. M. (2001). Delivery methodology of the Delphi: A comparison of two approaches. Journal of Park and Recreation Administration, 19(1), 42-58.

# **Attachments to Places & Activities in Outdoor Recreation**

# VISITOR MEANINGS OF PLACE: USING COMPUTER CONTENT ANALYSIS TO EXAMINE VISITOR MEANINGS AT THREE NATIONAL CAPITOL SITES

Wei-Li Jasmine Chen

Doctoral Candidate, Division of Forestry, West Virginia  
University, P.O. Box 6125, 322 Percival Hall,  
Morgantown, WV 26506

Chad L. Pierskalla

Assistant Professor of Recreation, Parks and Tourism  
Resources, Division of Forestry, West Virginia University,  
P.O. Box 6125, 322 Percival Hall, Morgantown, WV  
26506

Theresa L. Goldman

Assistant Professor of Recreation, Parks and Tourism  
Resources, Division of Forestry, West Virginia University,  
P.O. Box 6125, 322 Percival Hall, Morgantown, WV  
26506

David L. Larsen

Training Specialist/ Interpretive of Stephen T. Mather  
Training Center, National Park Service & National  
Conservation Training Center, P.O. Box 77, Harpers Ferry,  
WV 25425-0077

---

**Abstract:** A mix method study designed to explore the meanings, interest, and connections visitors ascribe to three National Park Service sites: National Capital Parks—Central, Rock Creek Park, and George Washington Memorial Parkway's Great Falls Park. The researchers employed the focus group interview technique and asked visitors prior to and then after an interpretive encounter what the resource and the place meant to them. Both hand-coding and the Minnesota Contextual Content Analysis (MCCA) software program were used in the analysis process. Selected findings suggested audiences' understanding and appreciation of the park resource.

---

## Introduction

Recent studies have explored and documented the relationships among recreation resources, visitor meanings and perspectives of place, and the likelihood of participating in resource stewardship. Williams, Patterson, Roggenbuck, and Watson (1992) suggest to incorporate the concept of "sense of place" to better understand recreation. Sense of place concerns people's *meanings* associated with places, which are formed through personal experience (Tuan, 1974, 1977; Relph, 1976). Various studies suggest applying the sense of place concept in resource management and interpretation (Appleyard, 1979; Roggenbuck, Williams & Bobonski, 1992; Brandenburg & Carroll, 1995; Masberg, 1996; William & Stewart, 1998; Galliano & Loeffler, 1999).

Every year, visitors from the U.S. and other countries flock to national parks to understand the places and to be inspired. Visitors attach significant personal meanings to national park sites such as the Lincoln Memorial and Vietnam Veterans Memorial (Goldman, Chen, & Larsen, in press). Quality interpretation requires an effort to integrate knowledge of the resource, knowledge of the audience, and appropriate techniques to yield desired interpretive outcomes (NPS, 1997; 2000a; 2000b). Understanding visitors' meanings of place can increase interpreters' knowledge of their audience and regenerate interpreters' passion toward both the resource and the visitors (Goldman et al., in press). Interpretive managers and front-line interpreters need a more comprehensive understanding of the meanings that visitors bring to sites as well as the ability to apply that understanding to the development of interpretive programs. Understanding and interpretation are closely related, and most sociologists now recognize that some interpretation is involved in the acts of understanding (Marshall, 1994). To help interpreters achieve desired interpretive outcomes of facilitated intellectual and emotional connections with the resource and therefore a sense of stewardship, this study explored the meanings that visitors attach to the resources at three National Park Service (NPS) administered sites: National Capital Parks—Central, Rock Creek Park, and Great Falls Park.

## Literature Review

### Meanings, Places & Resource Stewardship

Meaning is the most fundamental unit to understand people and their perceptions (Blumer, 1969; Marshall, 1994). Dutch hermeneutic phenomenologist Van Manen (1990) believes that the whole human science research "is concerned with meanings—to be human is to be concerned with meaning, to desire meaning" (p. 79). Meanwhile, The concepts of "place" and "meanings" have archived prominence in the fields of geography, landscape architecture, public administration, historic preservation, natural resource management, education, counseling, and cognitive and social psychology. Place is a powerful concept that enables researchers to understand people's attitudes, values, motivations and behavior more holistically (Williams & Stewart, 1998). Specifically, place-based research explores the psychological engagement that transforms space into place (Tuan, 1977). Participation in resource stewardship increases when visitors connect to resource/place meanings (Roggenbuck et al., 1992).

### Meaning—The Fundamental Element

It would be difficult to imagine any sociological study did not look at how people think about the social world and social relationships—in other words, the *meanings* that the society has for individuals and groups. Osgood (1952) defines meanings as "a bundle of components including experiences, images, and feelings in addition to information." Indeed, some schools of thought (mainly the Chicago School) argue that meaning emerges through interaction (Blumer, 1969). For Blumer, whom later being

considered as the leader of symbolic interactionism, meanings are organic and can “grow” through the interacting and interlinking between one and another. He illustrated this point as followed:

Human group life consists of the fitting to each other of the lines of action of the participants indicating to one another what to do and in turn interpreting such indications made by the others. People are prepared to act toward their objects on the basis of the meaning these objects have for them. Human beings face their world as organisms with selves, thus allowing each to make indications to [oneself]. Human action is constructed by the actor on the basis of what [one] notes, interprets, and assesses. And the interlinking of such ongoing action constitutes organizations, institutions, and vast complexes of interdependent relations. (Blumer, 1969)

Researchers have been closely associated the concept of meaningful action with Max Weber, who distinguishes it from behavior (Marshall, 1994). Weber distinguishes meaningful actions from merely behavioral movement of which the actor does not attach a meaning (for example breathing). Meaningful social action, by contrast, is the action directed towards others and to which we can attach a subjective meaning. In addition, sociologists and linguists are interested in social actions because they draw from a socially constructed and acceptable language. Giddens (1984) addresses the significance of peoples' meanings of place; he suggests that places are both enabling and embedding. Physical locations affect people and people in turn affect those locations, constructing social meanings and determining their significance.

#### Meanings of Place & National Park Service's Interpretive Philosophy

Phillips (1997) links three components in his conceptualization of the meaning-making process: individual ascription, social consensus, and specific attributes of the object, event or place. The National Park Service's Interpretive Development Program (IDP) adopts a similar approach to understanding meanings. The IDP views meanings as inherent in the resource (i.e., “the resource possesses meanings and has relevance”) due to social consensus and specific attributes of the resource (Larsen, 1997). The IDP also recognizes that visitors ascribe personalized meanings to the resource (NPS, 2000a). Thus, a resource represents layers of meanings, and meanwhile, humans bring various perspectives to the site. The IDP also emphasizes the importance of incorporating universal concepts into interpretation. A universal concept, as defined by the National Park Service, is any intangible meaning (e.g., idea, concept, system, process) that is relevant to almost everyone but that does not mean the same thing to any two people (NPS, 2000a). Universal concepts can be any broadly relevant concept including, for example, beauty, family, love, death, justice, change, survival, power and freedom. They can be applied to human relationships, cultural resources or the natural environment. Ham (1992) refers to these concepts as

“highly personal things” including, “ourselves, our families, our health, our well-being, our quality of life, our deepest values, principles, beliefs and convictions” (p. 13). Ham urges interpreters to incorporate these concepts into interpretation and connect them to the inner circle of their lives. Universal concepts can be used to tap into the memories, values and experiences that many visitors share (Silverman, 1997; Wager, 1975).

#### Meanings of DC Parks—National Icons & Urban Wildland

As the national capital, Washington, DC is the home for several world-renowned heritage sites, which represent the spirit of America. Frequently, people consider these sites as the “national icons.” Take the Triangle for example, the Lincoln Memorial, the Korean War Veterans Memorial, and the Vietnam Veterans Memorial constitute a triangle area which is one of the most visited sites in Washington, DC. The Lincoln Memorial is a tribute to President Lincoln and the Union he sought to preserve. The memorial records Lincoln's Gettysburg Address and Second Inaugural Address. The steps, plaza and reflecting pool in front of the Lincoln Memorial have functioned as a place of protest and a forum for discussing issues such as race, civil rights, war and peace, and AIDS. The Vietnam Veterans Memorial has drawn millions of visitors from all over the country over the years. The site commemorates the sacrifice of American military personnel during one of the nation's least popular wars (NPS, 1998b). A journalist from the New York Times described the memorial as “a hallowed site” with a “spiritual dimension that transforms it into something like a sacred shrine, where pilgrims come and devotions are paid” (Niebuhr, 1994, November 11th). The Korean War Veterans Memorial is dedicated to all those who served during the Korean War (1950-1954), the first major conflict of the Cold War. The returning veterans were the first Americans not to receive a heroes welcome in recognition of the hardships they endured in their fight for freedom (NPS, 1998a). Taken together, the three study sites at NCP—Central represent diverse meanings related to war and peace, freedom and slavery, civil rights and patriotic duty, national leaders and common heroes, and the fundamental ideals upon which our nation was founded.

Meanwhile, Washington, DC is not just about memorials. “Urban” parks—parks that are located in urban areas but large enough to provide a sense of wildness are favorites for Washingtonians (e.g., Great Falls Park and Rock Creek Park). Rock Creek Park holds its uniqueness for which it contains both of a city park's connivance and a wilderness' pristine and diversity. The picturesque valley of Rock Creek has earned its fame especially during the spring by the visitors. But the 1,754 acres of forest, meadows, groves, paths, trails, and heritage landscapes within 5 miles of the White House, offers “a quiet respite from the bustle of urban life all year long for both Washingtonians and visitors to the Nation's Capital” (NPS, 2000c). The extensive system of trails and paths gradually leads the urban explorers from the street corners to a world of foodchains and ecosystems. In addition, Rock Creek Park has been recognized by city planners as a model of an urban “preserve,” for which the park is “penetrate deeply

into the city” and with “easy access to nature” (Duany, Plater-Zybek, & Speck, 2000, pp. 143-4). This unique characteristic is highly appreciated by landscape architects and urban residents. In addition, it serves as a boundary to restrain urban sprawl and unregulated rapid growth. Urban parks such as Rock Creek Park that cover large geographic areas may not be considered as “true” wilderness in the ecological sense, however, these parks provide “a close approximation of a wilderness experience” for many urban dwellers (Rust, 1994; Hester, 1999).

Unique challenges and opportunities present themselves as one tries to interpret resources like the memorials in our nation’s capital that reflect such diverse meanings as war and peace, freedom and slavery, civil rights and an obligation to serve (Martinez, 1988; Machlis, 1992; Bennett, 1998). An expanded understanding of the meanings of the resource, a sense of connecting with significant places, and spiritual experiences sound like worthwhile goals, but is this what visitors want? Visitors come to sites with a range of pre-existing meanings, but often it is unclear what meanings they bring. How does on-site experience influence the meanings visitors attach to these sites? Do visitors really care about relating to park sites in a way that transcends their sense of self and provides meaning at a deeper than intellectual level (Schroeder, 1990)? When interpretive rangers are overwhelmed with daily responsibilities and visitors’ “ludicrous questions” (Tilden, 1977, p. 46), they can easily overlook the extent to which these dynamics might be in play. Therefore, this study was undertaken to better understand the meanings visitors ascribe to three significant places on the national landscape: Great Falls Park, National Capital Parks—Central, and Rock Creek Park to foster the excellence of interpretation and a sense of stewardship.

### Study Objectives

This study did not intend to measure visitor attitude and then predict their behavior. Instead, the researchers propose to better understand the meanings that visitor have toward the three National Park Service sites at the greater Washington, D.C. area and provided suggestions for resource management and interpretive program development. The four study objectives include:

- To identify the meanings visitors attach to three NPS sites: Great Falls Park, NCP—Central (the Lincoln Memorial, the Korean War Veterans Memorial, and the Vietnam Veterans Memorial), and Rock Creek Park.
- To identify visitor interests related to interpretive programs.
- To identify the type and frequency of connections between the meanings of the resource and the interests of the visitor that occur among participants who have attended interpretive programs.
- To provide recommendations to improve interpretive training and on-site interpretive programming through expanded interpreter knowledge of the audience.

### Methods

The study incorporated a mixed method design. Methods include purposeful sampling for visitor interview participants, quasi-experimental pre-test/post-test design, focus group interview, and both quantitative and qualitative data analysis. During the summer of 1998, researchers conducted 89 focus group interviews and interviewed a total of 527 visitors. The study recorded participant responses to open-ended questions. The study used both hand coding and the Minnesota Contextual Content Analysis (MCCA) computer program to analyze the differences and similarities in visitor meanings between visitors who attended an on-site ranger-led interpretive program and those who did not.

### Sample Interview Questions

Focus group interviews were ideal for this study because “...the intent of focus groups is not to infer but to understand, not to generalize but to determine the range, not to make statements about a population but to provide insights about how people perceive a situation” (Krueger, 1994, p. 87). Focus group data also have high face validity because of the believability of participant comments (Krueger, 1994). During the focus group interview, researchers sought to elicit participant responses to open-ended questions about visitor meanings, interests and connections. Sample interview questions include the following:

- What drew you to the site today?
- What do these sites teach us?
- When you look at the statue of Lincoln, what thoughts go through your mind?
- What would you tell the younger generations about this place?
- When you are here, do you have a sense of interacting with history? How so?
- If you were a ranger, what would you tell your audience?
- *(For those who had attended an interpretive program)* Did the ranger’s talk help you think about this place in a new way?

Focus group interviews were tape recorded and transcribed verbatim.

### Computer-aided Content Analysis Software

MCCA was chosen for its ability to help users to compare a large number of complex texts. MCCA has been used to disambiguate and categorize word meanings of a wide variety of general social science concepts (Pierskalla & Anderson, 2000). The analysis procedures are standardized and extremely reliable for texts  $\geq 500$  words (McTavish & Pirro, 1990). MCCA calculates two normed score profile for each text segment: institutional or social context scores (c-scores) and concept emphasis scores (e-scores). First, *emphasis scores* or *e-scores* are computed for 116 idea/word categories and are measures of the overemphasis

or underemphasis of visitor ideas compared to usual English usage. Examples of E-score categories include: cognition, sanction, enjoy-like, virtue, future, community, deviance, and self-expression. Secondly, *contextual* or *c-scores* are computed for four social perspectives (traditional, practical, emotional, and analytical) and are measured of the overemphasis or underemphasis of a social perspective of a text.

### Selected Findings

#### Participant Demographics

Focus group interview participants (N=527) were approximately half male (46%) and half female (54%). They came from various geographic regions. Participants from the United States represented more than 30 states and the District of Columbia. International participants came from England, Canada, Israel, Mexico, China, France, Nigeria, Germany, Russia, and the Netherlands. Results of the participants geographic regions indicated that the three study sites have different visitor compositions. For the National Capitol Parks—Central, only 1.1% were from nearby area and states (Washington DC, Virginia and Maryland) and 10.9% were international visitors. For Great Falls Par, 51.3% were local visitors and 6% were from other foreign countries. While for Rock Creek Park, the majority of the participants were from local (96.4%) and less than 1 % were international visitors. Participants were drawn from a wide range of age groups: 17% were under 13 years of age; 7% were 13-18 years old; 9% were 13-25 years old; 28% were 26-40 years old; 24% were 41-55 years old; and 15% were 56 years of age or older. The majority of participants were first time visitors to the site (41%) and 30% had visited the site five or more times. Not a question directly asked in the questionnaire, the researchers noted that most participants were of Anglo descent, although participants of African, Hispanic and Asian descent did engage in the interview process.

In terms of participant representation, the 182 participants interviewed at the National Capitol Parks—Central in this

study closely mirrored participants in a much larger visitor study (N=2,720) conducted at the same park during summer 1998 (Littlejohn & Hoffman, 1999). One notable difference between the two study populations is that the present study included more participants who had visited the site five or more times (17%) compared to Littlejohn & Hoffman who found that 8% of their sample had visited the site five or more times. Similarly, 44% of participants in the present study were first-time visitors to the site, compared to 56% first-time visitors in the Littlejohn & Hoffman study. Although the relative proportions still hold, these differences suggest that repeat visitors may have been more inclined to participate in an on-site focus group interview, and first-time visitors may have been less inclined to do so. However, the close demographic correlation between the two studies across all information categories suggests that the present study obtained a fairly representative sample of on-site visitors.

#### Emphasis Scores (E-Scores)

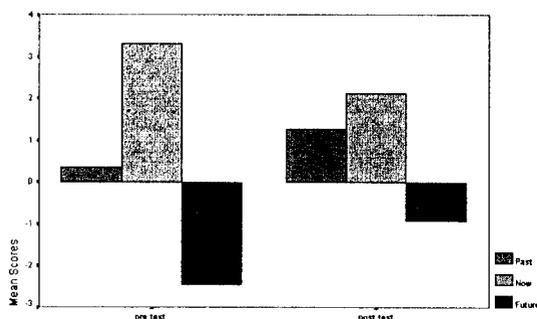
The MCCA computes the overemphasis or underemphasis of context ideas compared to standard English usage. These emphasize ideas are categorized into 116 idea/word categories with nominal scores (E-Scores) (McTavish & Pirro, 1990). The results of the computer-aided content analysis indicated the ideas emphasized by study participants. In Table 1, visitors as a whole emphasized several idea categories including (listed by frequency ranking: tender, cognition, object, location, move-in-space, if, reasoning, implication, humor-expression, and happy). These top-ten idea categories were identical for Rock Creek Park and Great Falls Park but in different orders. The results for the National Capital Parks—Central were distinguished from the other two parks. The highest score in the top ten list was the "object" rather than the "tender" category. Visitors of the National Capital Parks—Central highlighted different idea categories including "study," "we," and "being." Meanwhile, three idea categories that were excluded from the overall top-ten idea category list. These three idea categories were reasoning, happy and humor-expression.

Table 1. Overemphasized Idea Categories

	All Three Parks	Great Falls Park	Rock Creek Park	National Capitol Parks—Central
Rank 1	Tender	Tender	Tender	Object
2	Cognition	Location	Cognition	Tender
3	Object	Move-In-Space	Move-In-Space	Location
4	Location	Cognition	Object	Cognition
5	Move-In-Space	Object	If	Study*
6	If	Reasoning	Reasoning	Implication
7	Reasoning	If	Location	If
8	Implication	Humor-Expression	Implication	We*
9	Humor-Expression	Implication	Happy	Being*
10	Happy	Happy	Humor-Expression	Move-In-Space

\* Indicated idea categories that were not in overall the top-ten list.

The study results indicated the differences between visitors who had attended interpretive programs and those who had not. The researchers choose three emphasis scores which may have the implication on a concern for the parks' future: the *past*, *now*, and *future* idea categories. Figure 1 shows the relative shift of emphasis on these three categories for all three park sites. The three bars on the left indicate the e-scores of the three categories for the people who did not attend an interpretive program. The three bars on the right show the e-scores for the people who had attended a program. For the three categories, there was an increased overemphasis of the *past* idea for the after interpretation group interviews, a decrease of overemphasis on the *now* category, and an increase of the underemphasis on the *future* category.



**Figure 1. Emphasis Scores of Pre and Post Groups on All Three Sites**

## Discussion

The study intended to identify visitor meanings and interests of park resources. The study also intended to measure the intellectual and emotional connections that visitors made through interpretation with the meanings of the park. Study results suggested that visitors actively engaged in various park experiences. The top ten e-scores suggested that visitor did ascribe meanings to park resources when responding to interview questions. The results of the three focused e-scores “past, now, and future” suggested the shifts of emphasis between people who were exposed to interpretation and those who were not.

Heuristic e-scores suggest the overall character of ideas that are emphasized in the text (McTavish & Pirro, 1990; Garwick, Detzner, & Boss, 1994). The top ten e-scores suggested visitor meanings and their on-site experiences. Through thematic analysis, it was better understood the phenomenon of visitors experienced park settings physically by moving through the site and viewing it from all angles (move-in-space). They were strongly oriented to the physical space where their experience occurred (location and object). They thought about the meanings of site resources (reasoning, cognition, implication, if, study). They cared about site resources (tender). They enjoyed

themselves while on site (happy, humor-expression). They fully immersed themselves in the on-site experience (being), and in some cases that experience was group oriented (we) and a concern of the society as a whole.

The three focused e-scores measured the differences between visitors who *have* and *have not* attended interpretive programs in terms of their relative emphasis on meanings and connections. The scores implied interpreters' ability in facilitating connections with the past and future as this participant expressed a sense of willingness to act as a citizen in the future for the whole society:

[This place teaches us that] however big the problem, and however diverse the people involved, if you all have a common goal you can get together and do it. All races, all religions, they have experienced what these [sites] memorialize. And we've all [overcome the problems] in the U.S. together. (Post 1, pp. 4-5)

Van Manen (1990) raises a philosophical discussion on the idea of time that people experienced in the lived world. We act our lives of time. As van Manen examines, “the temporal dimensions of past, present, and future constitute the horizons of a person’s temporal landscape” (p. 104). For the park managers who seek to foster a sense of stewardship with the park resource, a connection with the past and, mostly, an increased connection with the future may imply a success on caring about the park resource in the future. Study results not only help researcher to better understand the phenomenon of visitor meanings, interest, and connection, they also help interpretive trainers to strategize the sequence and contents of interpretive training and development.

The MCCA e-score profiles function like an “idea spectrograph” or a park “fingerprint.” Over time, the researchers may become well experienced in analyzing park “MCCA fingerprints.” Future research may be able to compare fingerprints across various types of parks/resource settings, predict which concepts will be most likely to be emphasized, identify “surprises” in terms of categories emphasized, and better articulate what it means that visitors emphasized category X.

## Conclusion

The Minnesota Contextual Content Analysis program’s e-score profiles can help qualitative researchers zero in on visitor quotes that contain frequently emphasized concepts, serving as a “check” on the representativeness of the quote. Other visitors may not have expressed ideas so eloquently, but if a quote contains commonly emphasized idea categories, it’s probably not too “unlike” other quotes in the transcripts. The ultimate goal may be to develop software that can pick up more of the nuances that we are interested in for interpretive training and recreation/natural resource management.

## Acknowledgements

The authors wish to thank the West Virginia University Agriculture and Forestry Experiment Station, the Stephen T. Mather Training Center, Great Falls Park, National Capital Parks—Central, and Rock Creek Park for the financial and technical support they provided to this research effort.

## References

- Appleyard, D. (1979). The environment as a social symbol: Within a theory of environmental action and perception. American Planning Association Journal, 53, 143-153.
- Blumer, H. (1969). Symbolic interactionism: Perspective and method. Englewood Cliffs, NJ: Prentice-Hall.
- Brandenburg, A. M., & Carroll, M. S. (1995). Your place or mine?: The effect of place creation on environmental values and landscape meanings. Society and Natural Resources, 8, 381-398.
- Galliano, S. J., & Loeffler, G. M. (1999). Place assessment: How people define ecosystems. In T. M. Quigley (Ed.), Interior Columbia Basin Ecosystem Management Project: Scientific assessment (Gen. Tech. Rep. PNW-GTR-462). Portland, OR: USDA, Forest Service, Pacific Northwest Research Station.
- Garwick, A. W., Detzner, D., & Boss, P. (1994). Family perceptions of living with Alzheimer's disease. Family Process, 33, 327-340.
- Giddens, A. (1994). The constitution of society. Berkeley, CA: University of California Press.
- Goldman, T. L., Chen, W. L. J., & Larsen, D. L. (in press). Clicking the icon: Exploring the meanings visitors attach to three National Capitol Park Memorials. Paper submitted for the Journal of Interpretation Research.
- Ham, S. H. (1992). Environmental interpretation: A practical guide for people with big ideas and small budgets. Golden, CO: North American Press.
- Hester, R. T., Jr., Blazej, N. J., & Moore, I. S. (1999). Whose wild? Resolving cultural and biological diversity conflicts in urban wilderness. Landscape Journal, 12(2), 137-146.
- Krueger, R. A. (1994). Focus group: A practical guide for applied research (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Larsen, D. L. (1997). Module 101: What interpretation is. Interpretive Development Program Homepage. [On-line]. Available: <http://www.nps.gov/idp/interp/101/iesplan.htm>
- Littlejohn, M., & Hoffman, C. (1999). National monuments and memorials-Washington, DC: Visitor study (Visitor Services Project Report 105). Washington, DC: National Park Service.
- Machlis, G. E. (1992). Interpreting war and peace. In G. E. Machlis & D. R. Field (Eds.), On interpretation: Sociology for interpreters of natural and cultural history (Revised ed., pp. 233-244). Corvallis: Oregon State University Press.
- Martinez, D. A. (1988). Interpreting controversial historic sites: Insights and strategies applied at Custer Battlefield and the USS Arizona Memorial. In Program Paper of the National Interpreters Workshop (pp. 144-154). Fort Collins, CO: Association of Interpretive Naturalists.
- Masberg, B. A. (1996). Using ecotourists to assist in determining the content for interpretation. Journal of Park and Recreation Administration, 14(2), 37-52.
- Marshall, G. (Ed.). (1994). The concise Oxford dictionary of sociology. Oxford, NY: Oxford University Press.
- McTavish, D. G., & Pirro, E. B. (1990). Contextual content analysis. Quality and Quantity, 24, 245-265.
- National Park Service. (1997). Module 101: Why we do interpretation: Meeting the NPS mission. Interpretive Development Program Homepage. [On-line]. Available: <http://www.nps.gov/idp/interp/101/index.htm>
- National Park Service. (1998a). Korean War Veterans Memorial Homepage [On-line]. Available: <http://www.nps.gov/kwvm/>
- National Park Service. (1998b). Vietnam Veterans Memorial Homepage [On-line]. Available: <http://www.nps.gov/vive/>
- National Park Service. (2000a). Module 101: How interpretation works: The interpretive equation. Interpretive Development Program Homepage. [On-line]. Available: <http://www.nps.gov/idp/interp/101/howitworks.htm>
- National Park Service. (2000b). Module 103: Prepare and present an effective interpretive talk. Interpretive Development Program Homepage. [On-line]. Available: <http://www.nps.gov/idp/interp/103/index.htm>
- National Park Service. (2000c). Rock Creek Park Homepage. Available: [On-line]: <http://www.nps.gov/rocr/>
- Niebuhr, G. (1994, November, 11). More than a monument: The spiritual dimension of these hallowed walls. New York Times, p. A12.
- Osgood, C. E., Suci, G. J., & Tannebaum, P. H. (1957/1990). The measurement of meaning. Urbana: University of Illinois Press.

- Pierskalla, C. D., & Anderson, D. H. (2000). Turning qualitative text into interval-level data: A computer content analysis approach. In D. N. Bengston (Ed.), Applications of computer-aided text analysis in natural resources (Gen. Tech. Rep. NC-211, pp. 15-18). St. Paul, MN: USDA Forest Service, North Central Forest Experiment Station.
- Phillips, D. C. (1997). How, why, what, when, and where: Perspectives on constructivism in psychology and education. Issues in Education, 3(2), 151-195.
- Rolph, E. (1976). Place and placelessness. London: Pion Limited.
- Roggenbuck, J. W., Williams, D. R., & Bobinski, C. T. (1992). Public-private partnership to increase commercial tour guides' effectiveness as nature interpreters. Journal of Park and Recreation Administration, 10(2), 41-50.
- Silverman, L. H. (1997). Personalizing the past: A review of literature with implications for historical interpretation. Journal of Interpretation Research, 2(1), 1-12.
- Tilden, F. (1977). Interpreting our heritage (3rd ed.). Chapel Hill: The University of North Carolina Press.
- Tuan, Y. (1974). Topophilia: A study of environmental perception, attitudes and values. Englewood Cliffs, NJ: Prentice-Hall.
- Tuan, Y. (1977). Space and place: The perspective of experience. Minneapolis: University of Minnesota Press.
- Van Manen, M. (1990). Researching lived experience: Human science for an action sensitive pedagogy. The State University of New York.
- Wagar, J. A. (1975). Effectiveness in interpretation. The Interpreter, 7(3), 6-11.
- Williams, D. R., Patterson, M. E., Roggenbuck, J. W., & Watson, A. E. (1992). Beyond the commodity metaphor: Examining Emotional and symbolic attachment to place. Leisure Sciences, 14, 29-46.
- Williams, D. R., & Stewart, S. I. (1998). Sense of place: An elusive concept that is finding a home in ecosystem management. Journal of Forestry, 96(5), 18-23.

## THE IMPORTANCE OF VISITORS' KNOWLEDGE OF THE CULTURAL AND NATURAL HISTORY OF THE ADIRONDACKS IN INFLUENCING SENSE OF PLACE IN THE HIGH PEAKS REGION

Laura Fredrickson

Assistant Professor in Environmental Studies, St. Lawrence University, 101 Memorial Hall, Canton, NY 13617

---

**Abstract:** This study examined various dimensions of the sense of place experience felt by visitors to the High Peaks of the Adirondack Park. More specifically, a 6-page questionnaire (mail-back postage-paid) was distributed to 803 people over a three-month period (June, July & August, 1999). The two primary objectives of this study were to: 1) explore the various characteristics that influence visitors' sense of place within the High Peaks (including the emotive ties and symbolic associations visitors' assign to their special place), and 2) explore a possible relationship between visitors' knowledge of the cultural and natural history of the Adirondacks and a broader personal preservation/environmental ethic. Final results indicated that many visitors who experience a sense of place in the High Peaks feel so because it is a place of 'exceptional beauty' and many feel a sense of place based on their 'knowledge of the cultural and natural history of the Adirondacks'. Further analysis revealed that the level of importance visitors' felt toward their 'knowledge of the cultural and natural history of the Adirondacks' had some influential effect on their personal preservation/environmental ethic. Not surprisingly, there was a strong correlation between those visitors who felt a sense of place—verses—those who did *not* experience a sense of place, and the likelihood of them possessing a preservation/environmental ethic. Results indicate there is room for additional educational and interpretive programming in the area, focusing specifically on educating visitors about the cultural and natural history of the Adirondacks, besides basic visitor education about the conditions (and means by which) wilderness is realized.

---

### Introduction

The prevailing approach to research on outdoor recreation has been to focus primarily on the recreational setting itself. That is, focusing on the various physical, social, and managerial factors that create a particular setting. In addition, past research on outdoor recreation has tended to further reduce the analysis to a general and frequently broad overview of the level of satisfaction one associates with a particular recreational setting, given he or she can carry out his or her preferred recreational activity in that particular setting. However, both modes of analysis are somewhat limited. In that, the first approach attempts to identify setting features necessary to support specific activities or desired experiences (Schreyer, Knopf & Williams, 1985), and in so doing, the recreational setting is seen as a collection of features or attributes that allow the individual recreationist to fulfill or realize his or her personal recreational goal.

According to this view, the setting (described by its attributes) that the recreationist seeks out -- and eventually uses and impacts -- is ultimately viewed as a means to an end (McCool, Stankey & Clark, 1985). In effect, this approach to studying outdoor recreation underscores a utilitarian approach and suggests a degree of substitutability with regard to the recreational setting. That is, if a particular group of features or attributes are present at a given recreational setting -- allowing for specific types of recreational activities to occur -- than it seems likely that individual recreationists will be pleased or satisfied with the recreational setting itself. However, by emphasizing the role of setting attributes in the decision-making process, the problem of designing recreational settings (and allocating increasingly limited funds) is simply reduced to that of identifying the most valued and optimal combination of attributes for a given clientele (Peterson, Stynes, Rosenthal & Dwyer, 1985).

Furthermore, Williams (1989) observes that this view of the recreational setting as merely a collection of features and attributes leads to a severely limited view of the recreational setting as more of a uniform commodity (much like our mass produced automobiles) than a one of a kind setting that is special to the individual recreationist for reasons beyond its setting attributes. Furthermore, this utilitarian or commodity oriented view has resulted in numerous empirical studies which attempt to identify and measure the perceived utility of various setting attributes in satisfying various recreation goals (Cooksey, Dickinson & Loomis, 1982; Manfredi, Driver & Brown, 1983; McCool et al., 1985).

The second mode of analysis -- which is somewhat linked to the first -- attempts to gauge or measure the overall quality of the recreational experience itself according to a host of somewhat uncontrollable factors such as the number of visitors one encounters when engaged in the recreational activity of their choice. Moreover, how this positively (or negatively, which is more often the case) influences the individuals' recreational experience. For example, several studies document that privacy from persons in other parties and other users camping near one's campsite is the most important attribute of a wilderness experience (Stankey, 1973; Graefe, Donnelly & Vaske, 1986).

Both modes of outdoor recreation analysis are limited however. In that, both views tend to overlook the "meaningfulness" of the recreational experience as a whole. That is, the more affective or emotional and symbolic qualities of the recreation experience as a whole -- moving beyond merely the physical setting or the activities one engages in. The previous modes of analysis view recreation settings as somewhat interchangeable or reproducible provided there are similar combinations of replicable setting attributes. Brown (1989) however, asserts that outdoor recreation studies call for a more holistic type of analysis, one that tends toward the gestalt, rather than separate and disparate pieces of information.

## Various Place Phenomena

Within the past decade various studies have emerged that tend toward a more holistic characterization of the outdoor recreational engagement as a phenomenological experience (Fishwick & Vining, 1992; Fredrickson & Anderson, 1999; Mitchell, Force, Carroll & McLaughlin, 1991; Roberts, 1996). That is, recognizing that there are direct (through the senses) and indirect (through cognitive and symbolic processes) ways in which we take in information – and hence, make sense of, or derive *meaning* from our various life experiences. Furthermore, Williams (1988) suggests that there are three primary “modes” of outdoor recreation experience: activities, companions, and place settings.

Yet as Greene (1996) suggests, there are still only a few relevant studies that recognize the importance of the place setting by recreation researchers. More specifically, that an individual may experience a sense of affinitive connection or ‘sense of place’ toward a particular place. That is, a sense of special-ness or connectedness that the individual has for that particular place. Greene (1996) summarizes that a place acquires special meaning when an individual moves through a particular setting, acquiring information about the place and encountering memorable place-related experiences -- which are influenced by the characteristics of the physical setting, the characteristics of the social setting and characteristics of the individual perceiver. In effect, a sense of place results from an interaction between the unique cultural and physical characteristics of a setting and the personality and behavior of an individual in that setting (Steele, 1981). As Tuan suggests (1974) sense of place is frequently associated with an emotional or affective bond between an individual and a particular place. The bond may vary in intensity from immediate sensory enjoyment to a long-lasting deeply rooted attachment to a particular place.

Therefore, undifferentiated space becomes ‘place’ as one gets to know it better and endows it with value or *meaning*, and essentially what results is a degree of place attachment toward a particular geographic locale. A place becomes inextricably associated with certain life events and the people with whom the individual shared the event, and for many people what results is a strong sense of attachment toward that particular place or a deep identification with the place (Low & Altman, 1992; Korpela, 1989; Proshansky, Fabian & Kaminoff, 1983; Stokols & Schumaker, 1981; and Proshansky, 1978).

### **Research Objective**

It seems natural to suggest that when an individual develops a strong association or special attachment to a particular place that the individual would extend a certain ethic of concern and care toward that particular place. That is, if an individual has strong feelings about a particular place they would be concerned about its long-term welfare – just as if the place were a family member or friend. The degree to which there is a correlation between one’s feelings of strong place attachment and one’s broader environmental concerns is central to this study. Moreover,

the underlying focus of this study is to determine whether a relationship exists between an individual’s symbolic association with the High Peaks region of the Adirondack - - vis-à-vis various place phenomena -- and one’s broader stewardship concerns for the natural world, evidenced by their involvement and membership in a conservation/environmental organization.

Preserving the unique character of the Adirondack Park -- which many would agree is a global model for integrated land use and conservation – is something that cannot be accomplished without understanding more completely the various reasons people choose to live and recreate in the region. Thus, identifying the various factors that contribute to, and/or influence a persons’ sense of place and place attachment for the High Peaks region may help future regional managers understand public reactions to various management directives, such as limiting the number of hikers per group or banning campfires in designated wilderness areas that fall above a certain altitude. More specifically, by determining whether a person’s strong sense of place attachment influences their conservation/environmental concerns, this could aid area managers in planning for and making future environmental education and visitor interpretation decisions, among other management directives.

The issue of place attachment and the degree of land stewardship peoples have toward special places in the High Peaks region of the Adirondacks is of particular interest, given the newly approved unit management plan for that area. For years the High Peaks region -- which lies in the northeastern section of the Park -- had been carrying out its field operations without any guiding long-term management plan for the area. Many would agree that managing in this way could possibly result in landscape degradation and misuse of resources, and in some instances the sensitive alpine vegetation in and around the summit areas of several High Peaks would suffer greatly.

### **Study Design**

#### Study Area

Whereas the western and southern Adirondacks are a gentle landscape of hills, lakes, wetlands, ponds and streams, the northeast section of the park contains the High Peaks. Forty-three of them rise above 4,000 feet and eleven have alpine summits that rise above timberline, making them quite popular for hikers and backpackers. Thus, the High Peaks region is the most popular region of the Adirondack Park, and subsequently receives heavy and intense visitation throughout the spring, summer and fall.

The Adirondack Park is the largest park in the contiguous United States. It contains six million acres, covers one-fifth of New York State and is nearly three times the size of Yellowstone National Park. More than half of the Adirondack Park is private land, devoted principally to forestry, agriculture and open-space recreation. The Park is home to 130,000 permanent and 110,000 seasonal residents, and hosts an estimated nine million visitors each

year. The remaining 45 percent of the Park is publicly owned Forest Preserve, protected as "Forever Wild" by the New York State Constitution since 1895. One million acres of these public lands are designated as wilderness, where a wide range of non-mechanized recreation may be enjoyed in a natural setting. The majority of the public land (more than 1.3 million acres) is classified as Wild Forest, where motorized uses are permitted on designated waters, roads and trails. Nearly 75 million people live within a day's drive of the Adirondack Park and the Park hosts more than 10 million people each year. Within the Park are more than 2,800 lakes and ponds, and more than 1,500 miles of rivers, fed by an estimated 30,000 miles of brooks and streams. Backcountry use of the most popular wilderness areas of the Parks, especially the High Peaks Wilderness Area, is increasing at about six percent per year.

With such an interesting (and often perplexing) mix of public and private lands, the overall management of the Adirondack Park itself has proven over time to be ultimately challenging. In the next century and beyond, the Adirondack Park must continue to offer vast areas of undisturbed open space as a sanctuary for native plant and animal species, and as a natural haven for human beings in need of physical and spiritual rejuvenation. It must also provide for sustainable, resource-based local economies and for the protection of community values in a Park setting.

#### Data Collection

The data for this study was collected over a three-month period beginning in June of 1999 and continued through August of the same year. Visitors were contacted primarily at the main trailhead and parking area at the Adirondack Loj, located approximately 12 miles southeast of the hamlet of Lake Placid, New York. The Adirondack Mountain Club, a non-profit conservation organization that performs vital trail maintenance functions throughout the Park, manages the Adirondack Loj itself, and the surrounding parking areas. However, the interior of the High Peaks region is managed under the broader land management directive of the State's Department of Environmental Conservation. Thus, historically, this accounts for some of the public's misunderstanding and resistance to particular recreation management directives.

The first time visitor is usually unaware that the Adirondack Mountain Club is responsible for much of the trail system throughout the Park, yet the state's Department of Environmental Conservation (DEC) is responsible for region wide resource management directives. These directives include not only recreational concerns but also issues regarding watershed management, fish and wildlife management, and various law enforcement matters. Oftentimes, the way in which the various regions of the Park are managed is often confusing to the first time visitor.

A total of 169 groups were contacted over the three-month sampling period. Of those, 125 were contacted in and

around the Adirondack Loj and adjacent parking area. The remaining 44 groups were contacted at one of several critical trail junctures within the interior of the High Peaks region -- primarily those in and around Mount Marcy and the John's Brook Lodge -- as well as the summits of several frequently climbed peaks in the region. Within the study period, three weekend (Friday - Sunday) and two week day (Monday - Thursday) sampling clusters were randomly selected each month. During sampling all parties entering or leaving the area were contacted and a short interaction took place between potential study participants and a field research assistant to determine whether or not the person(s) was interested in taking part in the research.

Those people who were interested in partaking in the study (and were at least 18 years old), were given a 6-page questionnaire to complete and mail-back in a pre-addressed stamped envelope. Daily sampling occurred from the hours of 10:00 a.m. until 8:00 p.m. A total of 803 surveys were distributed over the three-month sampling period. Of the parties initially contacted, only five individuals declined to participate in the study. In addition to first-person field contacts, field research assistants left 27 questionnaires on parked vehicles left along the roadside in non-designated parking areas just outside the managerial boundary of either the Adirondack Mountain Club or the DEC.

#### Instrument

A review of relevant sense of place and place attachment literature did not reveal a standardized scale for measuring place attachment. Past research efforts have employed individualized methods suited to the specific study (Fredrickson & Anderson, 1999; Greene, 1996; Shumaker & Taylor, 1983). Toward that end a pilot study was conducted over a two-month period during the summer of 1998 in the High Peaks region of the Park. The pilot study aimed to identify and evaluate self-report response items that captured various aspects of the sense of place and place attachment phenomena.

A six-page questionnaire was devised in conjunction with the information that was originally gathered from the pilot questionnaire. The questionnaire used for this study contained four distinct sections. The first section focused on examining the individuals' experience of various place phenomena, including various characteristics that influence a sense of place, the emotional and symbolic ties one attaches to their special place. The second section focused on examining whether or not the individuals possessed an preservation/environmental ethic based on their understanding of the cultural and natural history of the Adirondacks. The third section gathered general demographic information, and the fourth section identified various trip characteristics of individual respondents.

The first section provided an introductory descriptive statement about what constitutes a sense of place and place attachment, and the following operational was put in a text box at the top of the first page to prompt the participant as to the various types of place phenomena the questionnaire was designed to explore:

*'Sense of place' and 'place attachment' refers to the emotional or affective bonds that you form with a particular place; this bond may vary in intensity from immediate sensory delight to long lasting and deeply rooted attachment. It may occur even though you have visited a particular place only once. In other words, the place takes on special and important meaning for you. When you experience this deep sense of place attachment, the particular place lingers in your mind long after you have left it. These are the types of places I want to know about.*

The first question was designed to distinguish between respondents who had no special attachment for a particular place in the High Peaks region of the Adirondack Park, and those who did. After reading the previous description, respondents were then asked the following question "Is there a place in the High Peaks region of the Park that is particularly important or special to you -- a place toward which you experience a deep sense of place or sense of attachment as described above?" Respondents were forced to choose between a 'yes', or 'no', response. The next series of questions (questions 2 - 5) were designed to explore the range of characteristics, emotional ties and symbolic associations that respondents held for their special place in the High Peaks.

The second section of the questionnaire focused on the participants' knowledge of the natural and cultural history of the Adirondacks as it relates to a conservation/environmental ethic. Two key questions were asked in this particular section and the first read as follows: "Has your knowledge of the cultural history of the Adirondacks encouraged a desire to preserve the long-term health and integrity of the 'people, places, and community' that make up the Adirondacks? In other words, has your knowledge of the cultural history of the Adirondacks stimulated a conservation ethic in you?" The second key question read: "Has your knowledge of the natural history of the Adirondacks made you want to preserve the long-term health and integrity of the 'natural places and biotic community' that make up the Adirondacks? In other words, has your knowledge of the natural history of the Adirondacks stimulated a conservation ethic in you?" Respondents were asked to answer each question with a 'yes', 'somewhat' or 'no, not at all' response. If they answered 'yes' to either of the questions, they were then asked to identify the specific part(s) of the cultural or natural history of the Adirondacks that was especially important to them.

The third section of the questionnaire solicited general demographic information such as the participant's age, gender, location of primary residence, and annual income. The fourth and final section of the questionnaire gathered basic trip characteristics for each participant such as: day of week visited, length of stay, activities pursued during visit, and group size.

#### **Data Analysis**

To learn more about the underlying characteristics that influence an individuals' sense of place or place attachment

for a particular place in the High Peaks region a general frequency distribution was run on 7 independent characteristic variables. The characteristic variables were then examined to determine any general trend in the data. In addition, general frequency distributions were generated to determine the emotional ties and symbolic associations participants' had towards their special place. As well, frequency distributions were generated to examine whether individuals' perceived an acceptable substitute for their special place within the Adirondack Park.

To compare the responses of two particular questions with several potential answers, two-way tables (contingency tables) were produced with a Chi-square analysis of the distribution ( $\alpha = .05$ ). Observed responses were compared with expected responses to determine the source of significant associations between two questions. For example, Chi-square analysis was used to establish whether a relationship existed between those individuals' who experienced the presence or absence of a sense of place and their overall level of understanding of the natural and cultural history of the Adirondacks.

In addition, Chi-Square analysis was used to determine whether or not a significant relationship existed between those individuals' who claimed their understanding of the natural and cultural history of the Adirondacks influenced their conservation/environmental ethic and their involvement -- vis-à-vis membership -- in an environmental or conservation organization, such as *The Nature Conservancy*, *The Adirondack Mountain Club* or the *Environmental Defense Fund*.

#### **Results**

Of the 803 surveys that were distributed, 312 were completed and returned through the mail by the fall of 1999. Three surveys were initially dismissed from the analysis due to the fact that the participant was either not 18 years of age or older, or the questionnaire had been only partially completed. A total of 309 surveys were used in the final analysis, yet some variation in the sample size still exists for a few questions due to respondents who randomly skipped a particular question.

Since one of the primary goals of this study was to learn more about the various characteristics that influence an individuals' sense of place or place attachment (i.e. strong sense of connection to a particular place), the first question on the survey was designed to distinguish between those respondents who did experience strong place attachment for a particular place within the High Peaks region of the Adirondack Park and those who did not. Of the 309 questionnaires that were used in the final analysis, 217 were from participants who self-identified as having experienced strong place attachment to a particular place in the High Peaks region and the remaining 92 responses were gathered from participants who claimed no special place attachment to a particular place in the High Peaks region. Sampling results are summarized in Table 1.

**Table 1. Survey Contacts and Response Rate**

Survey Contacts	Study Area		Total
	Adirondack Loj Parking Area	Hiking Trails & Trail Junctures	
Total individuals contacted (number of <u>groups</u> contacted)	627 (125)	176 (44)	803 (169)
Valid surveys completed and returned by mail	172	137	N = 309
Participants who experience a strong sense of place	145	72	217
Participants who do not experience a strong sense of place	61	31	92
Response rate per study area (%)	27	78	38(%)

**Key Question Results**

Participants were asked to rank the importance of several characteristics that potentially influence attachment to a special place: 'exceptional beauty' was the most influential characteristic (83% ranked it as "very important"), with 'the knowledge of the cultural & natural history of the Adirondacks as second-most influential (81% of 199 respondents). Participants also included characteristics such as: 'engagement in recreational activities' (67% of 202

respondents), and 'wilderness' (52% of 203 respondents). See Table 2.

The third question asked participants about the emotional ties that they had for their special place: eighty-three percent of the 217 respondents felt 'refreshed/restored'; seventy-one percent felt 'relaxed'; seventy-three felt 'wonder & awe'; and surprisingly, eighty-six of all 217 respondents indicated *not* feeling 'peaceful' toward their special place.

**Table 2. Characteristics That Influence Visitors' Sense of Place Within the High Peaks**

Characteristic	N	Response	Frequency	Percent
Past Personal History	203	Not Important	65	0.32
		Somewhat Important	52	0.26
		Very Important	86	0.42
Knowledge of the Cultural & Natural History of the Adirondacks	199	Not Important	8	0.02
		Somewhat Important	13	0.06
		Very Important	162	0.81
Engagement in Recreational Activities	202	Not Important	16	0.08
		Somewhat Important	51	0.25
		Very Important	135	0.67
Place of Exceptional Beauty	208	Not Important	5	0.02
		Somewhat Important	30	0.14
		Very Important	173	0.83
Place Has Spiritual Meaning	192	Not Important	54	0.28
		Somewhat Important	64	0.33
		Very Important	74	0.39
Place is Part of My Personal Identity	198	Not Important	30	0.15
		Somewhat Important	70	0.35
		Very Important	98	0.49
Place is Wilderness	203	Not Important	17	0.08
		Somewhat Important	80	0.39
		Very Important	106	0.52

The next question sought to determine the broader symbolic associations participants made in response to their special place: seventy-one percent of 217 respondents indicated the place represented 'serenity/peace'; sixty-nine percent indicated it represented 'wonderment'; and surprisingly, only eighty percent indicated their special place represented 'refuge/sanctuary'.

Of the 217 respondents who experienced place attachment to a particular locale in the High Peaks, nearly three-quarters of the participants (73%) felt there was a suitable substitute for their special place. Moreover, sixty-six percent felt they could find a substitute special place in another area of the Park.

The next question attempted to gauge the level of influence various environmental, social and managerial conditions had on visitors' sense of place. As shown in Table 3, respondents found: the 'absence of litter, soap in the water, and trail erosion' as extremely positive (69%); 'direct encounters with other park visitors' as extremely negative (75%), while thirty-nine percent indicated that 'in-direct encounters with other park visitors' as somewhat negative; almost half of the respondents (40%) found 'encounters with park officials (rangers, peak stewards, etc.)' as

somewhat positive; and nearly half of the respondents (40%) found the 'presence of park facilities (trail markers, lean-to's, interpretive signage)' as somewhat positive.

The following two questions were designed to assess whether the participants understanding and knowledge of the cultural and natural history of the Adirondacks precipitated a particular land ethic. For example, question number 7 read, "Has your knowledge of the cultural history of the Adirondacks encouraged a desire to preserve the long-term health and integrity of the people, places and communities that make up the Adirondacks? In other words, has your knowledge of the cultural history of the Adirondacks stimulated a preservation ethic in you?" The number of respondents (N=302) who responded 'yes', 'somewhat' and 'no, not at all' was 35%, 32% and 32% respectively. Participants were additionally asked to indicate which parts of the cultural history of the Adirondacks visitors found important. Typical responses included: era of the Great Camps; history of lumbering; history of the Adirondack Park formation; State declaration of the "Forever Wild" forests; era of guiding and the importance of guide boats; and the era of hunting & trapping.

**Table 3. Influence Various Environmental, Social & Managerial Conditions Has On Visitors' Sense of Place In High Peaks**

Condition	N	Response	Frequency	Percent
Absence of Human Induced Impacts (e.g. Litter, Soap in Water, Trail Erosion)	213	Extremely Negative	7	0.03
		Somewhat Negative	3	0.01
		Neutral	14	0.07
		Somewhat Positive	41	0.19
		Extremely Positive	148	0.69
Direct Encounters With Other Park Visitors (e.g. on trail, campsite, trail juncture)	203	Extremely Negative	152	0.75
		Somewhat Negative	37	0.18
		Neutral	11	0.05
		Somewhat Positive	3	0.01
		Extremely Positive	0	0.00
In-Direct Encounters With Other Park Visitors (e.g. distant sights and sounds)	206	Extremely Negative	35	0.17
		Somewhat Negative	81	0.39
		Neutral	73	0.35
		Somewhat Positive	12	0.06
		Extremely Positive	5	0.02
Encounters With Park Officials (e.g. rangers, peak stewards)	205	Extremely Negative	3	0.01
		Somewhat Negative	11	0.05
		Neutral	58	0.28
		Somewhat Positive	82	0.40
		Extremely Positive	51	0.25
Presence of Park Facilities (e.g. trail markers, lean-to's, interpretive signage)	205	Extremely Negative	4	0.02
		Somewhat Negative	3	0.01
		Neutral	45	0.22
		Somewhat Positive	81	0.40
		Extremely Positive	72	0.35

The next question read, "Has your knowledge of the natural history of the Adirondacks made you want to preserve the long-term health and integrity of the natural places and biotic community that make up the Adirondacks? In other words, has your knowledge of the natural history of the Adirondacks stimulated an environmental ethic in you?" Out of 293 respondents who completed this question, nearly half (49%) replied 'yes', roughly one-third (29%) indicated 'somewhat' and the remainder of the participants indicated 'no, not at all.' Additionally, participants were asked to identify which parts of the natural history of the Adirondacks visitors found important: extirpation of wolves and extinction of other species; geologic history and the landforms of the region; ecological history (e.g. natural fire regimes; shift in species composition; forest succession, etc.

Moreover, Chi-square analysis was performed on the results of those individuals who experienced a sense of place versus those who *did not* experience a sense of place to determine the degree to which the importance of their knowledge about the cultural history of the Adirondacks influenced a preservation ethic: there was a statistically

higher incidence of those individuals who experienced a sense of place (verses those who did not) and the likelihood of them possessing a preservation ethic (Table 4). In addition, Chi-square analysis was performed on the results of those individuals who experienced a sense of place versus those who *did not* experience a sense of place to determine the degree to which the importance of their knowledge about the natural history of the Adirondacks influenced an environmental ethic: there was a statistically higher incidence of those individuals who experienced a sense of place (verses those who did not) and the likelihood of them possessing an environmental ethic (Table 5).

Correspondingly, a comparison of results was conducted to determine the significance of an individuals' knowledge of the cultural and natural history of the Adirondacks and their membership in a conservation, preservation or environmental organization. Chi-square analysis showed a strong association between those who placed great importance on their knowledge of the cultural and natural history of the Adirondacks and the likelihood of them belonging to a conservation/environmental organization. (See Tables 6 and 7.)

**Table 4. Importance of Knowledge of the Cultural History of the Adirondacks with Regard to Visitors' Preservation Ethic**

	Park Visitors Who Did Not Experience A Sense of Place	Park Visitors Who Did Experience A Sense of Place	All Park Visitors
Cultural History Not At All Important to Visitors' Preservation Ethic	44 28.56	54 69.44	98 98.00
Cultural History Somewhat Important To Visitors' Preservation Ethic	20 28.56	78 69.44	98 98.00
Cultural History Highly Important to Visitors' Preservation Ethic	24 30.89	82 75.11	106 106.00
All Park Visitors	88 88.00	214 214.00	302 302.00

Chi-Square = 17.572, DF = 2, P-Value = 0.000

**Table 5. Importance of Knowledge of the Natural History of the Adirondacks with Regard to Visitors' Environmental Ethic**

	Park Visitors Who Did Not Experience A Sense of Place	Park Visitors Who Did Experience A Sense of Place	All Park Visitors
Natural History Not At All Important to Visitors' Environmental Ethic	30 18.41	35 46.59	65 65.00
Natural History Somewhat Important to Visitors' Environmental Ethic	21 23.80	63 60.20	84 84.00
Natural History Highly Important to Visitors' Environmental Ethic	32 40.79	112 103.21	144 144.00
All Park Visitors	83 83.00	210 210.00	293 293.00

Chi-Square = 13.275, DF = 2, P-Value = 0.001

**Table 6. Significance of Individuals' Knowledge of the Cultural History of the Adirondacks and Their Membership in A Conservation, Preservation or Environmental Organization**

	Non Member of Preservation Organization.	Member of Preservation Organization	All Park Visitors
Cultural History Not At All Important	70 55.53	28 42.47	98 98.00
Cultural History Somewhat Important	58 54.97	39 42.03	97 97.00
Cultural History Highly Important	42 59.50	63 45.50	105 105.00
All Park Visitors	170 170.00	130 130.00	300 300.00

Chi-Square = 20.961, DF = 2, P-Value = 0.000

**Table 7. Significance of Individuals' Knowledge of the Natural History of the Adirondacks and Their Membership in A Conservation, Preservation or Environmental Organization**

	Non Member of Environmental Organization	Member of Environmental Organization	All Park Visitors
Natural History Not At All Important	48 36.86	17 28.14	65 65.00
Natural History Somewhat Important	58 47.06	25 35.94	83 83.00
Natural History Highly Important	59 81.08	84 61.92	143 143.00
All Park Visitors	165 165.00	126 126.00	291 291.00

Chi-Square = 27.544, DF = 2, P-Value = 0.000

#### Socio-demographic Results

Exactly half of the participants were between the ages of 34-54, and 57 percent of the respondents were male while 43 percent were female. Half of the respondents had completed advanced graduate level education. One third of the respondents who permanently resided in a suburban location, while 25 percent resided in urban areas over 75,000 people. The remaining participants were from rural areas, small villages or lived within the Park itself. Of the respondents who participated in the study, 79 percent had previously visited the High Peaks before, and of those who had previously visited, over half (58%) claimed to visit the area several times a year. Well over half of the respondents (89%) had visited the High Peaks as part of a larger group (1-5 people), while only eleven percent traveled solo. Just over half of the respondents (56%) visited on a weekday and the remainder visited on a weekend. Sixty-six percent of the respondents included an overnight stay during their visit. The range of reasons for visiting the High Peaks included: the availability of diverse outdoor recreation opportunities (42% of respondents); because the High Peaks is a wilderness area (23%); because of their strong attachment to the place (22%); and fourteen percent of the respondents indicated it gave them time to enjoy companionship with others.

#### Discussion & Management Implications

What these study results clearly indicate, is that many visitors to the High Peaks region of the Adirondack Park

experience a strong sense of place or place attachment that is due, in part, to their knowledge of, and importance they place on understanding, the area's cultural and natural history. Furthermore, that this strong sense of place or place attachment is *not necessarily* based on past, repeat visitation to the area, nor living in close proximity to the area – which is a particular viewpoint several researchers and scholars hold (Low & Altman, 1992; Shumaker & Taylor, 1983; Tuan, 1974; Seamon, 1980). Rather, primarily the visitors' knowledge of the cultural and natural history of the Adirondacks, the relative beauty of the area, and the fact that much of the High Peaks is a wilderness area greatly influence visitors' experience of various place phenomena. This is not to suggest that visitors' past personal history with the area has no influence on sense of place – it is comparatively just less influential.

The state Department of Environmental Conservation, in conjunction with the Adirondack Mountain Club (ADK), may want to develop and promote additional cultural and natural history interpretive programming, considering the number of respondents who claimed that having knowledge of the history of the Adirondacks was important to their sense of place. Additionally, given the number of respondents who claimed their knowledge of the cultural and natural history was very important, and it was an influential factor on their membership in a preservation, conservation or environmental organization, the DEC and the ADK would be wise to further develop collaborative interpretive programming partnerships – similar to the collaborative effort demonstrated by the Peak Stewards Program.

Moreover, considering visitors' responses to the various environmental, social and managerial conditions present in the High Peaks and the impact direct encounters with other Park visitors had on participants' sense of place, it appears that the recently implemented reduction in party size limits in the High Peaks would be viewed as a positive management action. Additionally, considering the number of visitors who viewed direct encounters with Park officials, as positive overall, Park officials should continue with the various environmental/visitor-use education efforts they currently have in place – and perhaps, enhance those efforts to include basic information about the cultural and natural history of the Adirondacks.

Results also indicate that the DEC and other organizations that are involved in stewardship activities within the High Peaks – such as the Adirondack Mountain Club – should continue with various rehabilitative and conservation efforts in the area. For example, continuing with trail restoration efforts and re-vegetation and tree planting in areas that have experienced severe overuse, such as the site in the immediate vicinity of Marcy Dam. Another management strategy that could be implemented to mitigate or lessen the impact at heavily used areas is to amplify visitor education efforts regarding *other* wilderness options within the larger Adirondack Park considering the number of respondents who felt they could find a suitable substitute for their 'special place' in another part of the Park. In other words, put additional effort into educating users about other use options – thereby dispersing use overall.

Lastly, considering the number of visitors who claimed to experience a sense of place in the High Peaks region based on the fact that the area was a wilderness, additional visitor education efforts could be put into place to educate users about the unique characteristics that "define" wilderness. For example, some first time visitors might not understand the necessity of party size limits, non-motorized use regulations, or the need to limit future development on tracts of land that are classified as wilderness.

## Conclusion

Resource managers are just beginning to recognize the impact of managing recreational settings for their emotional, symbolic, and even spiritual values (Roberts, 1996; Salwasser, 1990), and the investigation of how sense of place and other place phenomena adds to our growing understanding of the importance of managing for these types of values. While the results presented here represent an initial exploratory step about how one's understanding of the cultural and natural history of an area helps to shape or influence sense of place, much remains to be done to understand and further measure the meaning of places outside the High Peaks.

The significance of a place approach is that it attempts to establish the connections between people and geographic areas directly rather than establishing such connections indirectly in the form of use and user characteristics, and activities-based recreation research. This approach can enhance future wilderness planning in the Adirondack Park.

For instance, much of the resource planning that has occurred in the past has failed to satisfy the public, in part because plans often do not indicate where proposed actions are to take place, *specifically*. Place attachment and strong sense of place reminds resource managers and other decision makers that the public is intimately involved with specific places under their jurisdiction. Furthermore resource planning fails to adequately capture the full range of meaning associated with wilderness and other wild lands. More often than not, planning has emphasized the ecological – and certainly the economic – values, while tending to ignore or overlook the emotional, symbolic and spiritual values of wilderness. Approaching the management of such richly complex areas as the Adirondack Park through a place perspective prompts managers to reconsider the outdated commodity approach to resource management. That is, the place perspective demonstrates that places are not just the sum of interchangeable attributes, but whole entities in themselves that people care passionately about. This type of approach acknowledges that resources – both ecological and historical – are not simply raw materials to be manipulated into a particular recreational opportunity. Rather, and perhaps more importantly, wilderness areas such as the High Peaks are places rich with deep history, places that hold significant symbolic value for the novice and return visitor alike, and lastly, those places which invoke a deep sense of place – for many people – bring shape, purpose and meaning to ones' life.

## References

- Brown, P. J. (1989). Quality in recreation experience. In A. Watson (Comp.), Outdoor recreation benchmark 1988: Proceedings of the National Outdoor Recreation Forum (Gen.Tech. Rep. SE-52). Ashville, NC: USDA, Forest Service, Southeastern Forest Experiment Station.
- Cooksey, R., Dikenson, T., & Loomis, R. (1982). Preferences for recreational environments: Theoretical considerations and a comparison of models. Leisure Sciences, 5, 19-34.
- Fishwick, L., & Vining, J. (1992). Toward a phenomenology of recreation place. Journal of Environmental Psychology, 12, 57-63.
- Fredrickson, L., & Anderson, D. (1999). A qualitative exploration of the wilderness experience as a source of spiritual inspiration. Journal of Environmental Psychology, 19, 21-39.
- Graefe, A., Donnelly, M., & Vaske, J. (1986). Crowding and specialization: A reexamination of the crowding model. In R. C. Lucas (Comp.), Proceedings – National Wilderness Research Conference: Current Research (Gen. Tech. Rep. INT-212, pp. 333-338). Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station.

- Greene, T. (1996). Cognition and the management of place. In B. Driver, D. Dustin, T. Baltic, G. Elsner & G. Peterson (Eds.), Nature and the human spirit: Toward an expanded land management ethic (pp. 301-310). State College, PA: Venture Publ.
- Korpela, K. M. (1989). Place-identity as a product of environmental self-regulation. Journal of Environmental Psychology, 9, 241-256.
- Low, S., & Altman, I. (1992). Place attachment: A conceptual inquiry. In E. Altman & S. Low (Eds.), Place Attachment (pp. 1-12). New York: Plenum Publ. Corp.
- Manfredo, M., Driver, B., & Brown, P. (1983). A test of concepts inherent in experience based management for outdoor recreation areas. Journal of Leisure Research, 15, 263-283.
- McCool, S., Stankey, G., & Clark, R. (1985). Choosing recreation settings: Processes, findings, and research directions. In G. Stankey & S. McCool (Comps.), Proceedings—Symposium on Recreation Choice Behavior (Gen. Tech. Rep. INT-184, pp. 1-8). Ogden, UT: USDA, Forest Service, Intermountain Research Station.
- Mitchell, M., Force, J., Carroll, M., & McLaughlin, W. (1991). Forest places of the heart: Incorporating special places into public management. Journal of Forestry, 4, 32-37.
- Peterson, G., Stynes, D., Rosenthal, D., & Dwyer, J. (1985). Substitution in recreation choice behavior. In G. Stankey & S. McCool (Comps.), Proceedings—Symposium on Recreation Choice Behavior (Gen. Tech. Rep. INT-184, pp. 19-30). Ogden, UT: USDA, Forest Service, Intermountain Research Station.
- Proshansky, H. (1978). The city and self-identity. Environment and Behavior, 10, 147-169.
- Proshansky, H., Fabian, A. & Kaminoff, R. (1983). Place-identity: Physical world socialization of the self. Journal of Environmental Psychology, 3, 57-83.
- Roberts, E. (1996). Place and spirit in public land management. In B. Driver, D. Dustin, T. Baltic, G. Elsner & G. Peterson (Eds.), Nature and the human spirit: Toward an expanded land management ethic (pp. 61-80). State College, PA: Venture Publ.
- Salwasser, H. (1990). Gaining perspective: Forestry for the future. Journal of Forestry, 88(11), 35-38.
- Schreyer, R., Knopf, R., & Williams, D. (1985). Reconceptualizing the motive/environment link in recreation choice behavior. In G. Stankey & S. McCool (Comps.), Proceedings—Symposium on Recreation Choice Behavior (Gen. Tech. Rep. INT-184, pp. 9-18). Ogden, UT: USDA, Forest Service, Intermountain Research Station.
- Seamon, D. (1980). The human experience of space and place. New York: St. Martin's Press.
- Stankey, G. H. (1973). Visitor perception of wilderness recreation carrying capacity (Res. Pap. INT-142). Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station.
- Shumaker, S. A., & Taylor, R. B. (1983). Toward a clarification of people-place relationships: A model of attachment to place. In N. Feimer & E. Geller (Eds.), Environmental Psychology: Directions and Perspectives (pp. 219-251). New York: Praeger.
- Stokols, D., & Shumaker, S. A. (1981). People in places: A transactional view of settings. In J. Harvey (Ed.), Cognition, Social Behavior, and the Environment (pp. 441-488). Hillsdale, NJ: Erlbaum.
- Tuan, Y. (1974). Topophilia: A Study of Environmental perception, attitudes, and values. Englewood Cliffs, NJ: Prentice-Hall.
- Williams, D. (1988). Measuring perceived similarity among outdoor recreation activities: A comparison of visual and verbal stimulus presentations. Leisure Sciences, 10, 153-166.
- Williams, D. (1989). Great expectations and the limits to satisfaction: A review of recreation and consumer satisfaction research. In A. Watson (Comp.), Outdoor Recreation Benchmark 1988: Proceedings of the National Outdoor Recreation Forum (Gen. Tech. Rep. SE-52, pp. 422-438). Ashville, NC: USDA, Forest Service, Southeastern Forest Experiment Station.

## ATTACHMENTS TO PLACES AND ACTIVITIES: THE RELATIONSHIP OF PSYCHOLOGICAL CONSTRUCTS TO CUSTOMER SATISFACTION ATTRIBUTES

Thomas D. Wickham

Assistant Professor, Department of Earth Sciences, 250  
University Avenue, California University of Pennsylvania,  
California, PA 15419

Alan R. Graefe

Associate Professor, School of Hotel, Restaurant and  
Recreation Management, The Pennsylvania State  
University, 201 Mateer Building, University Park, PA  
16802

---

**Abstract:** This study explores the nature of place attachment, enduring involvement and human territoriality and their relationship with customer satisfaction for a diverse group of anglers at lakes in the New England region. Previous work has made limited headway in our understanding of how place attachment, enduring involvement, and human territoriality relate to people's evaluations of experiences and settings. This study attempts to address the deficiencies of previous research by combining the three constructs and examining their relationship with customer satisfaction. These constructs and their sub-dimensions (independent variables) were examined with twelve importance and satisfaction items as well as gap scores (dependent variables). The results suggest that, as place attachment and attraction (EI) increase, satisfaction with the type of fish an angler can catch increases. Meanwhile, as territorial beliefs increase, anglers' satisfaction with the type of fish they can catch decreases. Significant paths were also found for other domains of customer satisfaction.

---

### Introduction

A number of factors including feelings that an individual may have for an area can play an intricate role in his or her choice of facility or setting (Bryan, 1977; Peterson, Stynes, Rosenthal, & Dwyer, 1985). A better understanding of how people discern, choose and relate to recreation settings and activities is important to understanding the recreation experience. Managers of recreation facilities attempt to use their own personal experience and knowledge along with information provided to them to make the best decisions. In the end, both researchers and managers want the recreationist to have the most satisfying experience possible. This study includes many of the variables that have been previously studied in order to improve visitor experiences.

A person's attachment to a geographic location has been of interest in a variety of fields for many years. In the field of geography, attachment to a place has been studied in terms of environmental behavioral issues (Relph, 1976; Stolkols & Shumaker, 1981; Tuan, 1974) as well as a person's

emotional or symbolic attachment to an area (Low & Altman, 1992; Relph, 1976; Tuan, 1980). While fields like geography have been studying attachment to place for some time, recreation researchers began exploring the concept during the first half of the 1980s. Research has consistently shown (Bricker, 1998; Moore & Graefe 1994; and Williams & Roggenbuck 1989) that place attachment is comprised of two central dimensions known as place dependence (functional meaning) and place identity (emotional or symbolic attachment to an area). A particular recreation area can be especially valuable to a person if it fulfills both dimensions of place attachment.

Past place attachment research has sought to understand what variables are most likely to influence the level of attachment a person will have with a recreation area (Moore & Graefe, 1994; Williams & Roggenbuck, 1989) and what influence place attachment will have on experience and managerial options (Bricker, 1998; Wickham & Kerstetter, 2000). Mowen, Graefe, and Virden (1998) took an important step in our understanding of place attachment when they examined the relationship of a combined place attachment/enduring involvement scale with both setting and experience evaluations.

Work by McIntyre (1989) generated interest in the concept of "enduring involvement" (EI) and its relationship to recreation specialization. In his study, McIntyre (1989) proposed the application of an EI instrument for examining the relationship between level of commitment to camping and choice of campground setting. The four-component EI model did not hold up under factor analysis. Rather, three components characterized enduring involvement in relation to camping. The three factors were termed attraction, self-expression, and centrality. An important step in our understanding of EI was taken by Mowen et al. (1998) when they examined the relationship between place attachment and enduring involvement with experience and setting assessments. The combined typology exhibited a positive and significant relationship with both setting and experience evaluations, confirming some previous work on involvement and service quality (Dimanche & Havitz, 1995).

In this study, as well as previous studies in the field of Environmental Psychology, human territoriality has been conceptualized as a person's attitude towards a specific place. Human territory is believed to consist of three dimensions known as territorial cognition, emotion, and behavior (Taylor, 1988). Territorial behaviors are an attempt on the individual's part to control not only the activities of others, but their access to a particular area. Territorial beliefs include an individual's perceptions or beliefs about who should enter a site, what goes on at the site, and who should take care of the site (Taylor, 1988). Territorial emotions include a positive emotional bond for a place and the condition of that site as well as the type of user that should use the area, and negative emotional reactions to possible changes in conditions and users in that very same area. Because recreation sites are often symbolic and have deep personal meaning for people, territorial models (e.g. crowding and conflict) stress an

individual's perceived control as an important part of a satisfying experience (Zinn, 1992).

Since the 1960s, researchers have been trying to determine what represents quality in outdoor recreation and how satisfied recreation customers are with their experiences. Consumer behaviorists have conducted similar research related to service quality and customer satisfaction. Parasuraman, Zeithaml, and Berry (1988) have played the leading role by developing a 22-item instrument named SERVQUAL. In the recreation and leisure field, SERVQUAL was adapted by Mackay and Crompton (1988) to better understand how people engaging in recreation activities evaluate quality of service from recreation providers. The gap analysis method (as used in this study) has been used to examine service quality. Gap scores can be positive or negative. When there is a positive gap score, this indicates that an item is performing greater than a person's expectation. A positive score represents satisfaction with an item a person is evaluating. Conversely, negative gap scores represent items that are performing below a visitor's expectation.

In an attempt to make satisfaction models more tangible for researchers and managers, Burns, Graefe, Absher and Titre (1999) created a customer satisfaction model with four domains (facilities, services, information, and recreation experience). This customer satisfaction model is believed to be more easily translated and understood by recreation researchers and managers because the items within the domains are designed to be more relevant and tangible. The domains used are also believed to be flexible in nature and may be adapted to meet the needs of the specific recreation area under study.

The purpose of this study was to examine the relationships between place attachment, enduring involvement, human territoriality and customer satisfaction. This study investigates the individual and cumulative effects of these variables on customer satisfaction. Data were obtained from anglers in the New England District of the U.S. Army Corps of Engineers (COE). Anglers were asked about the lakes they fish most frequently. The study's overall intended purpose was to investigate the relationships between several psychological constructs, service quality indicators, and overall satisfaction. More specific to this paper was the examination of the relationships between place attachment, enduring involvement, human territoriality and customer satisfaction attributes.

## Methodology

A multiple-method approach was used for data collection to obtain a diverse sample of anglers from the New England region. Several COE project offices provided names of individuals, groups, and club representatives for researchers to contact by phone. A total of eight groups out of fifteen contacted agreed to provide the names and addresses of their members for a mail-out survey. As a means of increasing the sample size for the study, a stratified random sample of users was contacted on-site at four lakes (Hopkinton-Everett Lake, East Brimfield Lake,

Buffumville Lake, and West Thompson Lake). Upon the completion of a brief on-site interview, each respondent was asked if she/he was willing to provide his/her name and address for a follow-up mail-back survey.

In total, 433 addresses were collected for this survey. A modified implementation of Dillman's (1978) multiple mailing process was used (four instead of five mailings). A total of 123 usable surveys were returned from the address database for a response rate of about 33%. Surveys were also sent to two large state bass fishing organizations. By combining the surveys returned from the mail-out portion of the study and the surveys distributed to the state bass organizations, the total sample size for this study increased to 176.

A telephone survey of non-respondents was conducted as a precautionary measure in order to determine if there was a significant difference between non-respondents and respondents in the study. Thirty interviews were completed and the sample means of 13 items were compared with the results in the original mail survey. This comparison between respondents and non-respondents showed little significant difference between the two groups.

## Measurement

Customer satisfaction was measured using a list of 12 items patterned after scales developed by Parasuraman et al. (1985), Mackay and Crompton (1990) and Burns et al. (1999). The domains used in this study include facilities, services, information, and recreation experience. Respondents rated each statement using a five-point Likert-like scale ranging from "not at all important" to "extremely important" and "not at all satisfied" to "extremely satisfied."

Respondents were asked to respond to eight place attachment statements patterned after previous research (Moore & Graefe, 1994; Bricker, 1998). The proposed sub-dimensions of this construct are place dependence and place identity. A five-point scale ranging from "strongly disagree" to "strongly agree" was used to measure level of agreement with each of the place attachment items.

An angler's level of involvement with fishing was measured with 13 items. These items were closely designed after previous researchers' use of the scale. The four domains of enduring involvement included in this study are enjoyment, importance, self-expression, and centrality (McIntyre, 1989). For involvement, a five-point scale with possible responses ranging from "strongly disagree" to "strongly agree" was used.

Human territoriality (Wickham & Zinn, 2001) was measured with 12 items. The items used in this study are newly designed and intended to measure recreationists' emotions, beliefs, and behaviors towards a specific place. The items in the human territoriality scale use a five-point scale with responses ranging from "strongly disagree" to "strongly agree."

## Analysis

A factor analysis was used to determine the dimensions of place attachment, enduring involvement, human territoriality and customer satisfaction (importance/performance). One of the most important characteristics of factor analysis is its data reduction capability. Factor analysis and Cronbach's coefficient alpha were used to verify the internal dimensions of these constructs in an outdoor recreation setting. This study also used multiple regression analyses to examine the relationships between dependent variables (importance and satisfaction for each of the customer satisfaction items) and independent variables (place attachment, enduring involvement, human territoriality).

## Results

In terms of past research regarding place attachment, studies have traditionally found the construct to consist of two main dimensions, place identity and place dependence. In this study, the 8 items used to measure place attachment loaded onto one factor. With all items contributing to the factor, it was not necessary to remove any items for further analysis. The single factor for place attachment, with an Eigenvalue of 4.43, explained 55.35% of the variance and had a reliability level of .88.

A factor analysis for the construct, enduring involvement, initially achieved four factors. Factor 1 was made up of items from the importance, enjoyment, and centrality domains. Similar in nature to a dimension McIntyre (1989) found, the 5 items that made up the first factor were called "attraction" (Eigenvalue=4.66; Variance=35.86; Reliability=.81). The second factor loaded with all the self-expression items (Eigenvalue=1.62; Variance=12.43; Reliability=.79). This factor loaded exactly as McIntyre's four self-expression items did with beach campers. Two more factors were extracted during the analysis, each with two items. Because of conceptually unusual factor loadings (factor 3) and low reliability scores (factor 4), both factors were removed from further analysis.

The third variable to be tested with factor analysis was human territoriality. An initial factor analysis of the 12 items in the construct identified five factors. Of the 12 items originally predicted to represent human territoriality, two items loaded separately from the first three factors and were dropped from further analysis. The first dimension, territorial emotions, retained all four items originally hypothesized to represent this domain (Eigenvalue=2.67; Variance=22.26; Reliability=.69). The second dimension, representing territorial behaviors, retained three of the four items predicted to represent this aspect of human territoriality (Eigenvalue= 1.93; Variance=16.07; Reliability=.52). Lastly, the third factor represented territorial beliefs. As with the dimension representing territorial behaviors, territorial beliefs retained three of the four predicted items (Eigenvalue=1.23; Variance=10.23; Reliability=.55). While the reliability scores for the three dimensions revealed through factor analysis were moderate to low, principle component analysis with varimax rotation supported the three factors initially conceptualized as

components of human territoriality. Therefore, it is believed that further analysis of these dimensions is warranted.

For the importance and performance variables, principle component factor analysis was again used to examine the dimensionality of the variables. For both sets of variables, factor analysis did not reveal any logical relationships between the items. Because the items did not load together in a logical manner, all individual items representing importance and satisfaction domains were used and no composite indices were created.

The use of factor analysis revealed some expected and some surprising results regarding the internal structure of the constructs used in this study. In summary, one dimension represented place attachment, two dimensions (attraction and self-expression) represented enduring involvement, and three dimensions (beliefs, emotions, and behaviors) represented human territoriality. The created indices were used with multiple regression to better understand the relationship between independent and dependent variables.

Based on the proposed theoretical model (Figure 1), regression models were developed to identify the relationships between place attachment, enduring involvement, human territoriality, and the importance/performance customer service items. Standardized beta coefficients were used to identify the relative importance of each independent variable to the subsequent dependent variable. For the relationships between independent variables, correlations between variables (*r*-values) ranged from .003 to .761. While there were a few moderately high correlation scores among the independent variables, the majority were well within an acceptable range. Figures 2 through 4 show the significant relationships between the identified independent and dependent variables.

A total of twelve items were examined as dependent variables (Importance items 1-12) with the independent variables of place attachment, attraction (EI), self-expression (EI), territorial beliefs, territorial emotions, and territorial behaviors (Figure 2). The purpose of this section of the study was to examine the relative strength of the independent variables in explaining the importance of various customer service items.

Four of the twelve regression equations tested were statistically significant. The importance of cleanliness of toilet facilities was related to territorial beliefs and self-expression (6% of variance explained). The importance of appearance and maintenance of the lake area was related to territorial behaviors and territorial beliefs (15% of variance explained). The importance that an angler places on the type of fish they can catch was significantly predicted by the attraction dimension of enduring involvement (8% of variance explained). Lastly, territorial behavior was the only significant predictor of importance of the number of fish a person can catch at a lake (5% of variance explained).

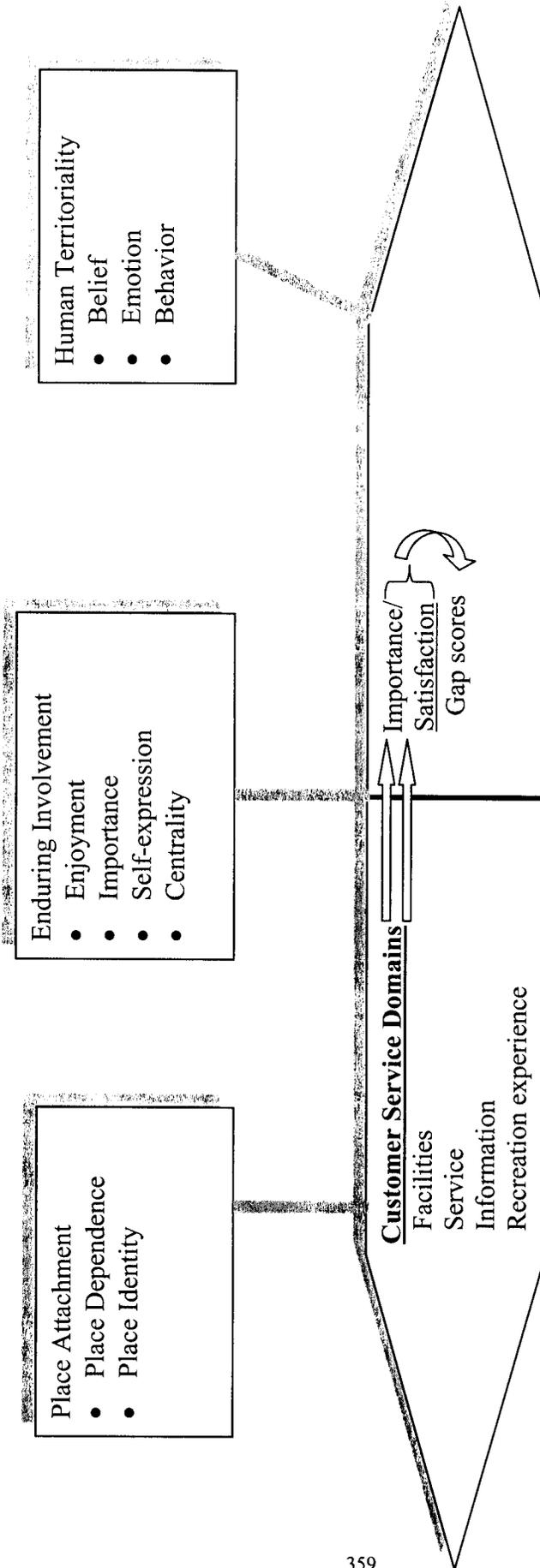
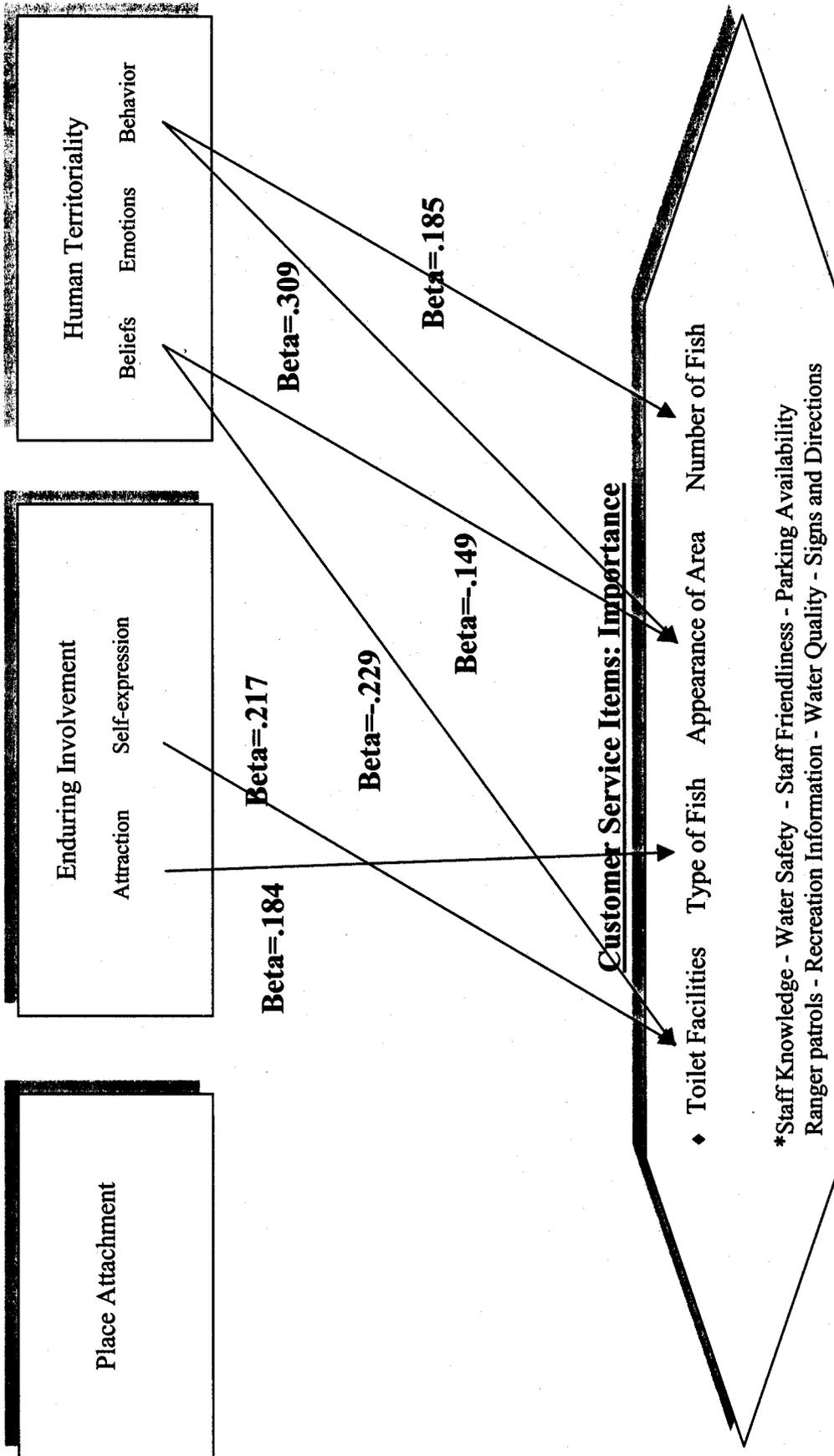
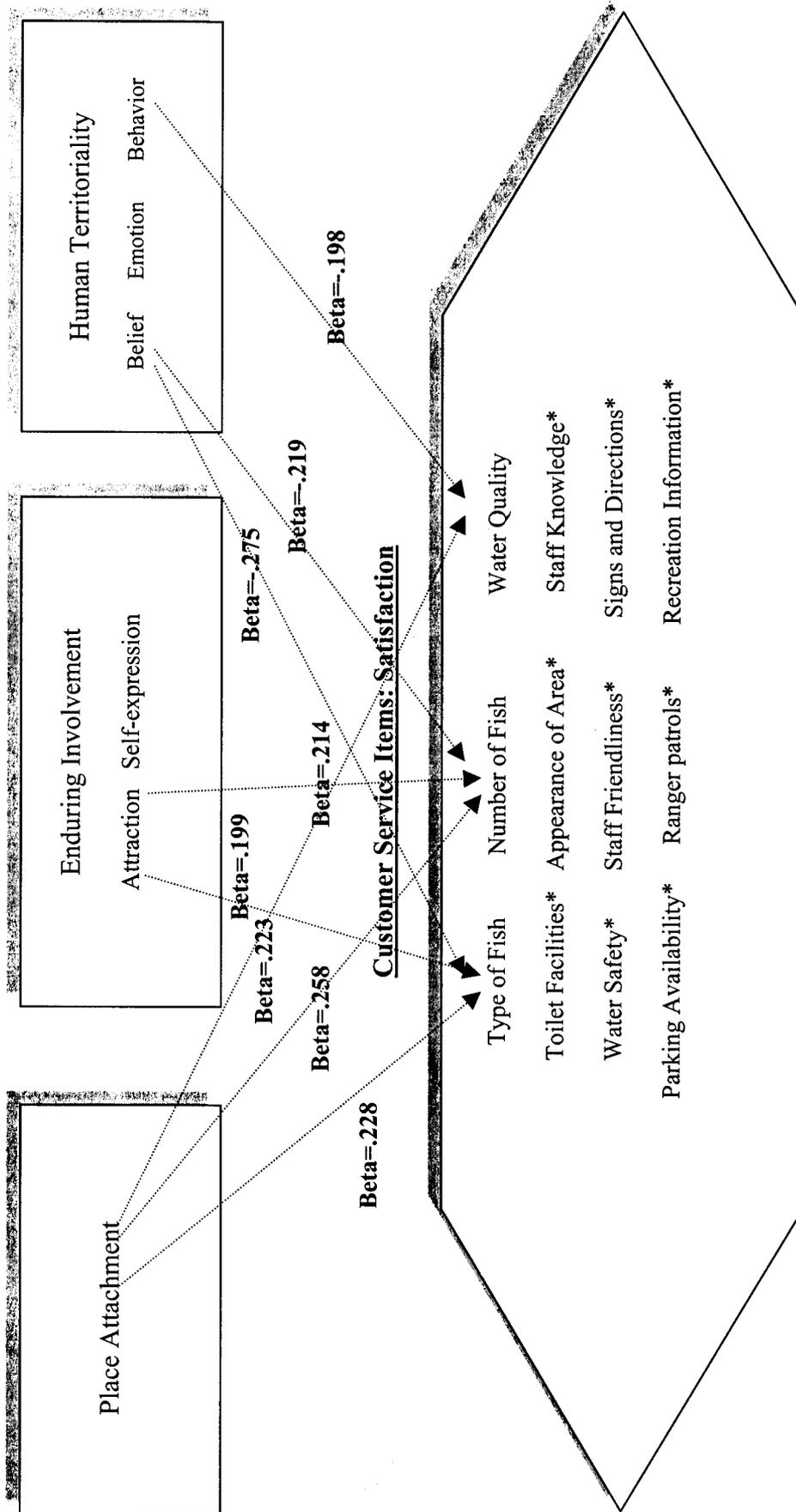


Figure 1. A Proposed Model of Place Attachment, Enduring Involvement, Human Territoriality, and Customer Satisfaction 1



- ◆ Dependent variables found to be significantly predicted by independent variables
- \* Dependent variables found to have no significant relationship with independent variables

Figure 2. Relationship of Place Attachment, Attraction, Self-expression, Beliefs, Emotions, Behaviors with Importance Items as Dependent Variables



\* Dependent variables found to have no significant relationship with independent variables

Figure 3. Relationship of Place Attachment, Attraction, Self-expression, Beliefs, Emotions Behaviors with Satisfaction Items as Dependent Variables

Place attachment, enduring involvement, and human territoriality were next tested for their relationship with level of satisfaction with the customer service items. For this hypothesis, three of the 12 regression equations were found to be significant (Figure 3). The significant relationships included: satisfaction with the type of fish that can be caught and territorial beliefs, attraction (EI), and place attachment (16% of variance explained); satisfaction with the number of fish a person can catch and place attachment, territorial beliefs and attraction (EI) (11% of variance explained), and satisfaction with water quality and territorial behaviors and place attachment (5% of variance explained).

The final step of the analysis was to examine the relationships between the independent variables of place attachment, attraction (EI), self-expression (EI), territorial beliefs, territorial emotions, and territorial behaviors and the item gap scores (Figure 4). Only one of the item gap scores was significantly predicted by any of the independent variables. Apparently, the independent variables are better predictors of importance and satisfaction scores than they are of the item gap scores (difference between importance and satisfaction). The only regression equation that was significant included the gap score for appearance and maintenance of the lake area with territorial behavior (7% of variance explained).

### Conclusions and Implications

The theoretical framework for this study was formulated from both existing research and newly designed instruments to measure formerly speculated relationships. Previous research has explored the relationship between variables like place attachment and enduring involvement with various satisfaction-related items. However, no studies were found that used a management-oriented customer service model. This study takes place attachment, enduring involvement and human territoriality and explores the relationship of these variables within a conceptual model of customer satisfaction.

The customer satisfaction model examined in this study uses items that are believed to be closely related to actual services at recreation areas. Because the independent variables measure psychological constructs related to place and activity, it should not be surprising that they best predict those items that are theoretically related to either activity or place. The results are similar to those found by Mowen et al. (1998) in which place attachment and activity involvement measures were significantly related to measures of satisfaction for both place and recreation experiences. Thus, the results of this study partially support previous research in this area. Place attachment, enduring involvement, and human territoriality were less successful in predicting items that were related to either the service or information domains of customer satisfaction.

Future researchers should consider using the same variables and perhaps other recreation-related variables; however, some of the results show a need for modifying the current constructs as they were used in this study. As Bricker (1998) determined, qualitative methods of researching

recreationists' attachments to special areas can produce vastly different results than quantitative methods. Certainly, all four constructs (place attachment, enduring involvement, human territoriality, and customer satisfaction) could benefit from future qualitative research.

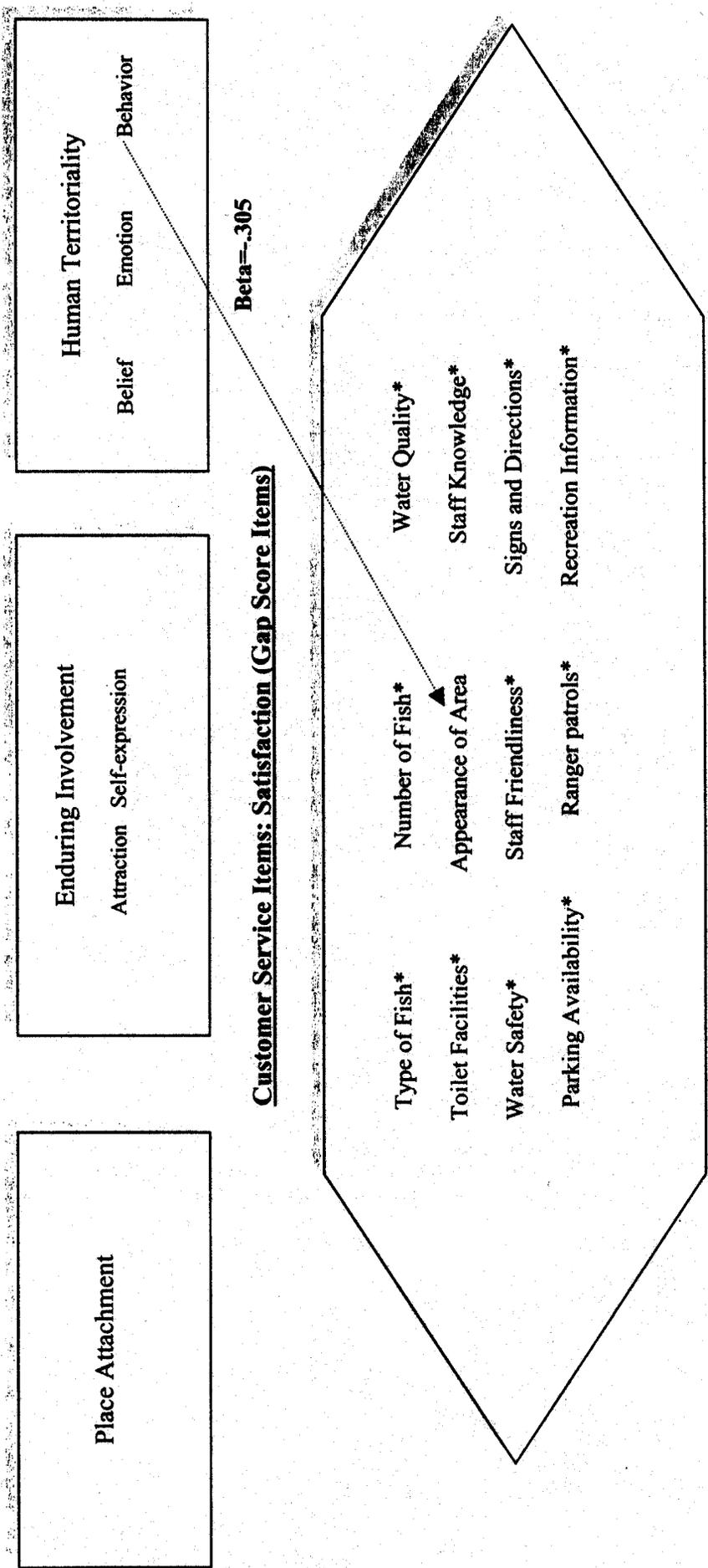
Most current studies examining involvement no longer use the construct examined in this study. A more common and current involvement scale has been designed and modified by Dimanche, Havitz and Howard (1991) and others over the last decade.

Human territoriality, as used in this study, will also have to be modified. Low to moderate reliability scores show a weakness in the current items and, perhaps, the dimensions will need to be altered for future research in this area. For the importance/performance domains, it may be useful to examine other domains such as a natural resources domain or a more developed recreation experience domain. While this study has opened many doors, it has also raised many questions. Researchers should continue to refine the measures that were used in this study and explore their relationships.

In this study, various dimensions of place attachment, involvement and human territoriality were related to different items measuring satisfaction. The continued use of these items and their refinement could help researchers and managers better understand how they might improve recreationists' experiences. Because public recreation agencies are being asked to provide a wide variety of activities and satisfying experiences within various settings, positively influencing place and activity attachment appears to be an effective strategy for increasing visitor satisfaction. This study supports this notion as has past research (Dimanche & Havitz, 1995; Mowen et al, 1998). A continued refinement of measures such as those used in this study could provide more information to make quality decisions with regard to management plans. In the end, if programs could target people in an effective and efficient manner, future policy decisions regarding the allocation of funds to specific programs could be more efficient and, ultimately, produce more satisfied customers.

### Literature Cited

- Bricker, K. S. (1998). Place and preferences: A study of the whitewater recreationists on the South Fork of the American River. Unpublished doctoral dissertation, The Pennsylvania State University, University Park.
- Bryan, H. (1977). Leisure value systems and recreation specialization: The case of trout fisherman. Journal of Leisure Research, 9, 174-187.
- Burns, R., Graefe, A., Absher, J., & Titre, J. (1999). Water-based recreationists' attitudes regarding customer satisfaction: Differences between selected market segments. In H. Vogelsong (Ed.), Proceedings of the 1998 Northeastern Recreation Research Symposium (Gen. Tech. Rep. NE-255, pp. 166-171). Radnor, PA: USDA, Forest Service, Northeastern Research Station.



\* Dependent variables found to have no significant relationship with independent variables

Figure 4. Relationship of Place Attachment, Attraction, Self-expression, Beliefs, Emotions Behaviors with Gap Scores as Dependent Variables

- Dimanche, F., & Havitz, M. E. (1995). Exploring the importance of involvement and other selected variables in predicting perceptions of service quality. Paper presented at the NRPA Symposium on Leisure Research, San Antonio, TX.
- Dimanche, F., Havitz, M., & Howard, D. (1991). Testing the Involvement Profile (IP) scale in the context of selected recreational and tourist activities. Journal of Leisure Research, 23(1), 51-66.
- Low, S. M., & Altman, I. (1992). Place attachment: A conceptual inquiry. In I. Altman & S. M. Low (Eds.), Place attachment: Human behavior and environment. Advances in theory and research: Vol. 12 (pp. 1-12). New York: Plenum Press.
- Mackay, K. J., & Crompton, J. L. (1990). Measuring the quality of recreation services. Journal of Park and Recreation Administration, 8(3), 47-56.
- Mackay, K. J., & Crompton, J. L. (1988). A conceptual model of consumer evaluation of recreation service quality. Leisure Studies, 7, 41-49.
- McIntyre, N. (1989). The personal meaning of participation: Enduring Involvement. Journal of Leisure Research, 21(2), 167-179.
- Moore, R. L., & Graefe, A. R. (1994). Attachment to recreation settings: The case of rail-trail users. Leisure Sciences, 16, 17-31.
- Mowen, A. J., Graefe, A. R., & Virden, R. J. (1998). A typology of place attachment and activity involvement. In H. Vogelsong (Ed.), Proceedings of the 1997 Northeastern Recreation Research Symposium (Gen. Tech. Rep. NE-241, pp. 89-92). Radnor, PA: USDA, Forest Service, Northeastern Forest Experiment Station.
- Parasuraman, A., Zeithaml, V. A., & Berry, L. (1985). A conceptual model of service quality and its implications for further research. Journal of Marketing, 49, 41-50.
- Parasuraman, A., Zeithaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple item scale for measuring consumer perceptions of service quality. Journal of Retailing, 64, 12-40.
- Peterson, G. L., Stynes, D. L., Rosenthal, D. H., & Dwyer, J. F. (1985). Substitution in recreation choice behavior. In G. H. Stankey & S. F. McCool (Comps.), Proceedings, Symposium on Recreation Choice Behavior (Gen. Tech. Rep. INT-184, pp. 19-30). Ogden, UT: Northwest Science Association, USDA Forest Service, Intermountain Research Station.
- Ralph, F. (1976). Place and placelessness. London: Pion Ltd.
- Stokols, A., & Shumaker, S. A. (1981). People in places: A transactional view of settings. In J. H. Harvey (Ed.), Cognition, social behavior, and the environment (pp. 441-488). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Taylor, R. B. (1988). Human territorial functioning: An empirical, evolutionary perspective on individual and small group territorial cognitions, behaviors, and consequences. Cambridge, UK: Cambridge University Press.
- Tuan, Y. F. (1974). Topophilia: A study of environment perceptions, attitudes, and values. Englewood Cliffs, NJ: Prentice-Hall.
- Tuan, Y. F. (1980). Rootedness versus sense of place. Landscape, 24, 3-8.
- Wickham, T., & Kerstetter, D. (2000). The relationship between place attachment and First Night® participants' views of crowding, overall satisfaction, and future attendance. In G. T. Kyle (Ed.), Proceedings of the 1999 Northeastern Recreation Research Symposium (Gen. Tech. Rep. NE-269, pp. 332-335). Radnor, PA: USDA, Forest Service, Northeastern Research Station.
- Wickham, T., & Zinn, H. (2001). Human territoriality: An examination of a construct. In G. T. Kyle (Ed.), Proceedings of the 2000 Northeastern Recreation Research Symposium (Gen. Tech. Rep. NE-276, pp. 35-39). Radnor, PA: USDA, Forest Service, Northeastern Research Station.
- Williams, D. R., & Roggenbuck, J. W. (1989, October). Measuring place attachment: Some preliminary results. Paper presented at the Symposium on Leisure Research, National Recreation and Parks Association Annual Congress, San Antonio, TX.
- Zinn, H. C. (1992). Human territoriality and natural resource conflict. Unpublished manuscript.

## AN EXPLORATION OF HUMAN TERRITORIALITY IN FOREST RECREATION

Harry C. Zinn

Assistant Professor, Recreation & Park Management Program, The Pennsylvania State University, University Park, PA 16802

Laurlyn K. Harmon

Ph.D. Candidate in Leisure Studies, The Pennsylvania State University, University Park, PA 16802

Brijesh Thapa

Associate Professor, Department of Recreation, Parks, & Tourism, University of Florida, FL 32611

Deborah L. Kerstetter

Assistant Professor, Recreation & Park Management Program, The Pennsylvania State University, University Park, PA 16802

Alan R. Graefe

Assistant Professor, Recreation & Park Management Program, The Pennsylvania State University, University Park, PA 16802

---

**Abstract:** Previous studies in human territoriality have focused largely on behavior in urban settings. It is only recently that researchers are examining this construct in the context of forest settings. This study was designed to assess the territorial responses of visitors to Bald Eagle State Forest in central Pennsylvania and explore the structure and predictive validity of a proposed territoriality scale. Results indicated the sample was relatively homogenous in terms of demographics but included consumptive as well as non-consumptive forest visitors. Further analysis demonstrated only limited support for an exploratory territoriality scale and suggested the need for further research into the meaning and structure of human territoriality in forest recreation settings.

---

### Introduction

Resource-based recreation is often place-specific, and recreationists can develop strong bonds to favored places, as has been investigated with the place attachment construct. Another construct, human territoriality, may add to our understanding of human-place bonds in recreation and how these bonds relate to management issues.

Human territoriality has generally been studied in urban locations (Edney, 1976; Taylor & Brower, 1985). Applying the construct in the context of outdoor recreation is likely to require modification of existing measures and the development of new measures.

Human territoriality has been suggested to consist of three dimensions: place-specific cognitions; emotions; and,

behaviors (Taylor, 1988). Territorial beliefs may address social contact, autonomy, escape, perceived control, and responsibility for place. Territorial emotions may include positive affect toward a place and preferred conditions there as well as negative affect toward possible changes in conditions. On-site territorial behaviors may include responses to intrusions such as defense of occupied space and exercise of dominance over perceived outsiders. Off-site, territorial behaviors may include advocating for favored uses and management practices.

This study is an exploration of the territoriality construct in the context of forest recreation. The study was designed to measure territorial responses to "favorite places" in a state forest and test the structure and predictive validity of an exploratory scale incorporating Taylor's (1988) three dimensions of territoriality.

### Methods

In a year-long survey of visitors to a central Pennsylvania State Forest, participants were asked to identify a favorite place in the forest and answer a battery of fixed-answer and open-ended questions about their relationship to that place. Key variables in this study included respondents identification of their favorite place, beliefs about managing their favorite place, satisfaction regarding forest management issues, and responses to an exploratory territoriality scale.

A total of 477 useable responses was received. Seventy-two participants (15%) identified large, undifferentiated areas (e.g., the trails, the mountains) as favorite places, and 405 (85%) identified specific sites. Because we were attempting to examine territoriality as it relates to a specific place, in our analyses, we used only the latter group.

Content analysis was used to examine the open-ended responses regarding beliefs about participants' favorite places. Primary categories were identified for each of the questions into which participants logically were grouped. Principle components factor analysis with varimax rotation was used to examine the structure and predictive validity of the exploratory territoriality scale. Correlation and chi-square statistics were then used to examine the relationship between the hypothesized dimensions of territoriality and responses to satisfaction and beliefs about forest management.

### Findings

#### User Characteristics

Respondents who identified a specific favorite place within the forest were generally white (98%), male (85%), long-time forest users (mean = 25 years), middle income (56% = \$30,000-\$79,000/year), and moderately educated (51% = more than a high school education). Approximately half of the respondents (46%) lived within 30 miles of the forest and their mean age was 47 years. Interestingly, Table 1 indicates that many members of this group identify both consumptive (e.g., hunting/fishing) and non-consumptive (e.g., hiking, viewing scenery, relaxing) as favorite activities.

**Table 1. The Most Important Activities in which Respondents Participate at Their Favorite Place**

Activity	N
Hunting/fishing	357
Hiking/biking/riding	208
Viewing scenery/wildlife	145
Relaxation/peace/solitude	86
Cookouts/picnics	48
Camping	47
Motorized recreation	40
Swimming	35
Being with friends/family	19

Note: Respondents could list up to three activities.

### Geographic Distribution

Locating all favorite places on a forest map indicated that these sites were predominantly in the valleys of the state forest near roads, and not in less accessible areas. Further examination revealed over 80% of the locations to be located near a stream, e.g., Penns Creek, Poe Valley Area, White Deer Creek Area, Cherry Run. This is typical of visitation to other public recreation areas where visitors are more likely to visit areas with water than those without if given the opportunity.

### Beliefs about Favorite Places

Content analysis of open-ended responses indicated that the characteristic that made favorite places special most often was conduciveness to a particular recreation activity (Table 2). Not unexpectedly, the same characteristic was typically enjoyed most by participants' during their most recent visits to their favorite places. Other frequently identified characteristics of favorite places included privacy, quiet, memories linked to the site, and natural qualities. Both positive and negative characteristics of favorite places were related to the impact of other people. For example, opportunities for privacy, memories (often of other people), and encounters with others were important to more than one-third of the participants. In contrast, characteristics of favorite places that were enjoyed least included other's behavior, litter, and inadequate or intrusive maintenance.

The next set of questions centered on management issues and asked respondents to identify what they would keep the same, as well as what they would change, about their favorite place. Again, responses were analyzed for content and results are provided in Table 3. Interestingly, almost equal numbers of respondents indicated that the current wilderness quality and existing uses were the most important items to keep as suggested that facilities be improved and use patterns be modified. There appears to be two distinct groups in terms of this particular set of responses.

**Table 2. Content Analysis of Open-ended Responses about Favorite Places**

Beliefs	Percent	N
<b>What makes this place special?</b>	<b>100%</b>	<b>452</b>
Conducive to recreation activities	27.9%	126
Privacy/Quiet	21.9%	99
Memories	15.3%	69
Natural quality	14.6%	66
Convenience	10.8%	49
Views/Scenery	6.2%	28
Encounters with others	3.3%	15
<b>What did you like most about your favorite place on your last visit?</b>	<b>100%</b>	<b>422</b>
Conducive to recreation activities	33.2%	140
Natural amenities	27.2%	115
Quiet/Private	17.3%	73
Views/Scenery	13.5%	57
Encounters with others	6.2%	26
Memories	2.6%	11
<b>What did you like least about your favorite place on your last visit?</b>	<b>100%</b>	<b>245</b>
Natural constraints	17.0%	83
Other's behavior	9.6%	47
Litter	8.4%	41
Inadequate maintenance	5.7%	28
Personal constraints	5.1%	25
Rules	2.9%	14
Intrusive maintenance practices	1.4%	7

**Table 3. How Favorite Place Should Be Managed**

Belief	Percent	N
<b>What would you keep about your favorite place?</b>	<b>100%</b>	<b>219</b>
Wilderness quality	32.8%	72
Existing maintenance	27.4%	60
Existing uses	27.4%	60
Accessibility	8.2%	18
Existing rules	3.6%	8
Quiet/peace	.5%	1
<b>What would you change about your favorite place?</b>	<b>100%</b>	<b>283</b>
Improve facilities	36.7%	104
Modify use patterns	24.0%	68
Modify nature management	17.3%	49
Enforce rules	11.3%	32
Improve roads	10.6%	30

### Territoriality Scale Items

Exploratory factor analysis of an exploratory scale provided limited support for Taylor's three-dimensional (beliefs, emotions, behaviors) structure of human territoriality (Tables 4 & 5). The four items that loaded unambiguously on the first factor were emotional in nature as suggested by Taylor. However, the structure of the second and third factors was unexpected and unclear. Neither belief nor behavioral items loaded together consistently, and two items did not load strongly on any factor. Furthermore the internal consistency of the three hypothesized sub-scales as well as the three sub-scales suggested by the exploratory factor analysis was low, with Cronbach's alphas ranging from a high of .64 to a low of .27. Finally, the three sub-scales were tested as predictors of expectations regarding favorite places, satisfaction with

forest management, and responses to forest management issues, but no significant relationships were found.

### **Conclusion**

The first issue to examine is the lack of relationship between the territoriality scale and respondents' satisfaction and beliefs regarding management. The satisfaction and management items were measured with respect to the entire forest. However, the territoriality items were measured within the context of the favorite place identified within the forest. Satisfaction and responses to forest management issues may differ according to the level of geographic specificity defined. Thus, it may be that territoriality of a specific place does not provide insight regarding beliefs and behaviors relative to the broader context within which that specific place operates.

**Table 4. Factor Structure of Hypothesized Territoriality Scale Items, Their Factor Loadings and Reliabilities**

Sub-scale	Sub-scale item	Factor Loading	Standardized Alpha
<b>Factor 1 (Emotion)</b>			<b>.6431</b>
	I have a lot of fond memories about this place.	.646	
	I have a special connection to this place and the people that use it.	.620	
	This place means more to me than any other place I can think of.	.591	
	For me, lots of other places could substitute for this one.	.568	
<b>Factor 2 (Behavior)</b>			<b>.4275</b>
	I know this place better than the people who run it.	.712	
	I treat this place better than most other people that come here.	.583	
	I don't tell many people about this place.	.576	
	I do (or would) bring my children to this place.	-.194	
<b>Factor 3 (Beliefs)</b>			<b>.3130</b>
	People should be free to do whatever they want at this place.	.678	
	Managers need to restrict use at this place.	.672	
	Everyone should be able to use this place.	.503	
	People who have used this place longest should have priority using it.	.172	

**Table 5. Factor Structure of Territoriality Scale Items as Revealed by Exploratory Factor Analysis, Their Factor Loadings and Reliabilities**

Sub-scale	Sub-scale item	Factor Loading	Standardized Alpha
<b>Factor 1</b>			<b>.5548</b>
	I know this place better than the people who run it.	.712	
	People who have used this place longest should have priority using it.	.591	
	I treat this place better than most other people that come here.	.583	
	I don't tell many people about this place.	.576	
<b>Factor 2</b>			<b>.6127</b>
	I have a lot of fond memories about this place.	.646	
	I have a special connection to this place and the people that use it.	.620	
	This place means more to me than any other place I can think of.	.591	
	For me, lots of other places could substitute for this one.	.568	
	I do (or would) bring my children to this place.	.533	
<b>Factor 3</b>			<b>.2713</b>
	People should be free to do whatever they want at this place.	.678	
	Managers need to restrict use at this place.	.672	
	Everyone should be able to use this place.	.503	

In addition, as previously mentioned, the investigation of human territoriality in dispersed, non-urban settings, is still exploratory. More in-depth, qualitative data may be necessary in order to better understand this construct in the context of forest recreation.

Finally, this study may have masked patterns within individual groups (i.e., between consumptive and non-consumptive types of activities). Previous research on specific user groups such as anglers (Wickham & Zinn, 2001) suggests a stronger relationship between the territoriality construct and expectations. More information may be obtained for managers, particularly in this exploratory stage, if research is focused on specific user groups such as anglers or specific recreation sites such as campgrounds or picnic areas.

While not supported strongly by this study, other research suggests that the human territoriality construct can contribute to our understanding of outdoor recreation and recreationists' responses to management issues. However, additional research will be required to develop items that best capture the dimensions of the territoriality construct and clarify the relationship between territoriality and recreation.

## References

- Edney, J. J. (1975). Territoriality and control: A field experiment. Journal of Personality and Social Psychology, 31, 1108-1115.
- Taylor, R. B. (1988). Human territorial functioning: An empirical, evolutionary perspective on individual and small group territorial cognitions, behaviors and consequences. Cambridge, UK: Cambridge University Press.
- Taylor, R. B., & Brower, S. (1985). Home and near-home territories. In I. Altman & C. M. Werner (Eds.), Home Environments. New York, NY: Plenum
- Wickham, T. D., & Zinn, H. C. (2001). Human territoriality: An examination of a construct. In G. Kyle (Comp., Ed.), Proceedings of the 2000 Northeastern Recreation Research Symposium (Gen. Tech. Rep. NE-276, pp. 35-39). Newtown Square, PA: USDA, Forest Service, Northeastern Research Station.

## COMMUNITY ATTACHMENT AND RESOURCE HARVESTING IN RURAL DENMARK

Rodney R. Zwick

Professor of Recreation Resource Management, Lyndon State College, Lyndonville, VT 05851

David Solan

Professor of Business, Travel and Tourism, Mansfield University, Mansfield, PA 16933

---

**Abstract:** Community attachment has been related to "sense of place," and by extension to factors such as the natural resource base of a local geographic area and the utilitarian uses of those resources—a functional attachment that helps root people to a place. The purpose of this study was to examine the resource harvest activities of residents of three modern rural communities in Denmark and relate their participation in these activities to community attachment and satisfaction. A total of 160 residents from the three small communities selected in Jylland, Denmark, responded to a single wave of the survey. Even though this was a limited sample, the study found that about one-third engage in harvesting of natural resources and two-thirds are involved in domestic resource use. Eighteen motivations for engaging in natural resource harvesting were reduced to four factors which were subsequently used in a k-means cluster analysis to differentiate five motivational types of harvesters: 1) Outdoor Recreation oriented, 2) Non-recreation oriented, 3) Experience Nature, 4) Recreation Activity Tradition, and 5) Self-sufficiency oriented. Analysis of Variance was used to determine if the five types differed in their participation in natural resource harvesting activities and domestic resource activity use; the "Self-sufficiency" type was differentiated by its greater participation in both sets of activities. A measure of community attachment was then regressed on natural resource harvesting motivations, an aggregated natural resource harvesting index, an aggregated domestic resource use measure, community satisfaction, and life satisfaction. The *t* values of the multiple linear regression suggest harvesting of natural resources has the strongest positive relation to community attachment, followed by community satisfaction, and that the other variables do not have a strong relation to attachment. While motivations appear useful for developing a typology for examining harvest activities, they do not appear to be strongly related to community attachment; rather, actual engagement in harvesting activities appears to be more significant. Further exploration of rural cultures is needed to determine if this functional attachment to communities is supported in other settings.

---

### Introduction

Social researchers have described the tensions in modern cultures between the reward of residential mobility for economic and human capital development and the desire for a sense of place. Community attachment has been

empirically related to the intensity of a sense of place, contributing to bonding and helping to develop a rootedness (Tuan, 1980). Some authors have suggested these concepts of sense of place and community attachment also include an aspect of a culture's cosmology, a relationship with nature (Relph, 1976; Stokols & Shumaker, 1981). For rural cultures this has been conceptualized as not only a land ethic, but a utilitarian relationship, often involving consumptive uses of natural resources which bond people and people to place and thus, by extension, to community. Empirical studies in the U.S. have indicated that a positive, but weak, relationship exists between natural resource harvesting and place attachment (Williams, Patterson, Roggenbuck & Watson, 1992). A few studies have focused on such relationships in indigenous cultures, and found stronger relationships, but few have explored the relationship to community attachment in rural modern cultures with complex technology, mobility and education.

The purpose of this study was to examine a rural modern culture (i.e., rural communities within Denmark) with regard to their natural and domestic resource harvesting activities, explore the underlying motivations of those who engage in consumptive harvesting activities (e.g., hunting, fishing, vegetable/fruit farming, gathering wild edibles, and maintaining farm animals), and then relate these activities to community attachment and satisfaction.

### Study Setting

Three communities were selected in western Denmark for this study. Bobøl is primarily a farming community of less than 40 residences. The community has a well known private fishing area, Ribehøj Fiskepark. Stenderup is a crop and dairy farming community of approximately 160 households, and Jels is a large village and agricultural area of approximately 650 households. All three communities have existed since the 17<sup>th</sup> century as agricultural samfund (communities or unions). Even though 17<sup>th</sup> century buildings are still used for dwellings and housing farm/dairy animals and equipment, the crop, dairy, and swine operations are highly mechanized. The Danish government provides low cost capitalization loans, subsidies and tariff protection for much of the dairy and swine industries.

The communities were selected because of their location in rural Jylland, Denmark; a known area for hunting, freshwater fishing, and less than 35km access to saltwater fishing; variation in population size; and the researcher's familial ties to the area.

### Methods

A seven-page questionnaire booklet was designed for self administration. It included questions on number of adult relatives within a radius of 25km of the respondent, length of time in the lokalsamfund (community), three questions that were used in an aggregated community attachment measure, and questions on satisfaction with the local community and satisfaction with life in general.

Respondents were also asked a series of questions about whether they engaged in different types of hunting, fishing, and gathering activities, and activities related to domestic resource production such as gardening, raising farm animals, and of things others had discarded. In addition to their own activity and household use of these activities, the respondents were asked about their barter, selling and receiving of products from these activities. The sample members were also asked a series of questions about their motivations for participation in natural resource harvesting, rating the importance of each. They were also asked a series of socioeconomic and demographic questions. The questionnaire was translated to Danish, reviewed and checked by both the translator and a third party translator. It was then printed locally in Vermont.

Originally, the plan was to hand distribute the self-administered questionnaire to postal boxes at individual farm postal boxes in each of the three selected communities by walking or bicycling between residences. Upon the initial arrival in the communities and a two day surveillance, the initial distribution plan was abandoned as postal boxes were often at dwellings which were a quarter mile from the main road, residences were often considerable distances apart, and many residents retrieved their mail at the postal station. After receiving assistance and helpful suggestions from the regional post office in Rødding, a decision was made to distribute the questionnaire by mail, with a self-addressed stamped envelope for return. Subsequently, a census sample of households was drawn for Bobøl (N=37) and Stenderup (N=156), and a random sample of 350 households from Jels. As all stamps for the initial mailing, post card postage and return postage were purchased from the regional post office, postal authorities provided (after pleas and negotiation) two sets of labels for all households in the three lokalsamfunds. Questionnaire booklets were coded with an identification number, a cover letter was developed, translated to Danish, and printed in Copenhagen, and all 543 were mailed from Rødding, Jylland, Denmark. Returns were mailed to a postal pick-up in Copenhagen. Approximately three weeks later a postcard reminder and thank-you was sent to all members of the sample.

There were 532 deliverable questionnaires, a total of 160 were returned and considered to be useable. Response rates varied from 24 percent received from residents of Bobøl to 33 percent from Jels; a total response rate of 30 percent was obtained for the single wave of the survey and reminder.

## Results

Over fifty-four percent of the respondents were male, 41.6 percent female. Approximately seventy-nine percent (78.7%) were married or living with a partner, 11.5% single, 6.1% separated or divorced, and 4.7% of respondents were widowers or widows. Education varied for 130 respondents to the question, 39.2% reported having a folkeskole education (equivalent to 11-12 year schooling in U.S.), 7.7% have gymnasium (high school) education, 13.1% have a 2 to 3 year teacher certificate, 7.7% have a university or post-graduate degree, and 30% report having "other", which include technical schooling, folkehojskole, certificate programs, etc. Approximately 58% of respondents were employed full-time, 18.3% were employed seasonally or part-time, 8.8% were on paid student or paid parental leave, 6.6% were unemployed, and an additional 8.8% listed their employment status as "other."

Respondents were asked about the type of area in which they grew up; 42.7% grew up in a village, 23.1% grew up on a rural farm, 13.3% in the rural countryside, 11.9% in a provincial town or suburb, and 9.1% grew up in a city. Respondents lived in their communities for an average of 20 years (Std. Dev. = 16.66) with a distribution of less than 1 year local residence to 80 years. Respondents were asked to rate how satisfied they were with their lokalsamfund (community). Approximately 85.8% were somewhat satisfied or satisfied with their local community. In contrast no one reported being dissatisfied and only 4.1% were somewhat dissatisfied (see Figure 1).

Generally the respondents were satisfied with life. Only 6.2% were somewhat dissatisfied or dissatisfied as contrasted to the 85.6% who were at least somewhat satisfied (see Figure 2).

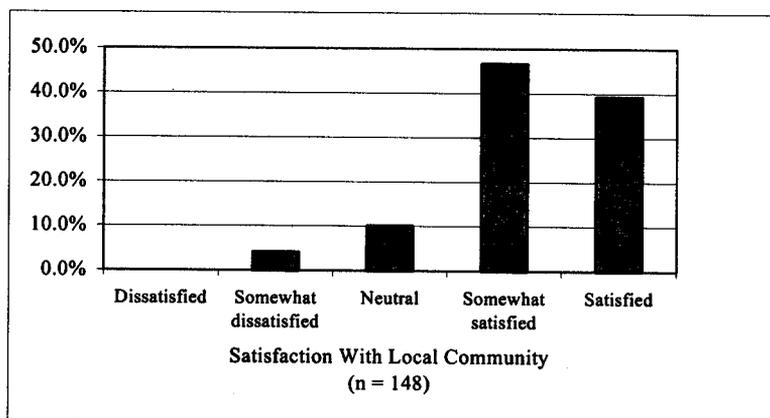
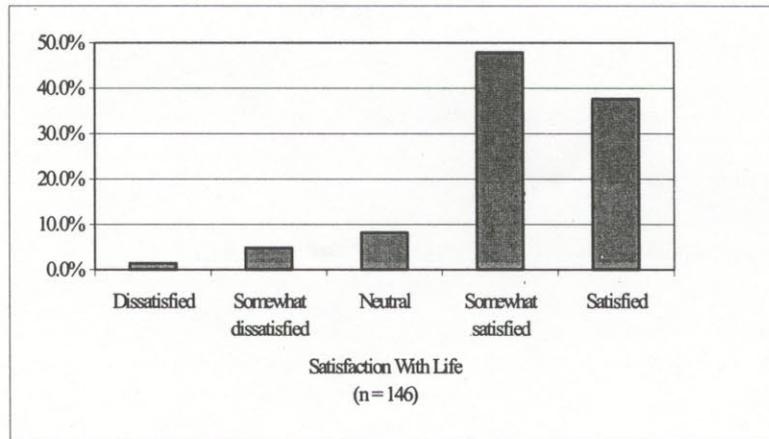


Figure 1. Respondent Satisfaction with Their Local Community



**Figure 2. Respondent Satisfaction with Life, in General**

Respondents engage in a variety of natural resource harvesting activities and domestic resource production activities; over 30.4% fresh water fish, 22.4% salt water fish, 19.4 % hunt birds, 21.4% harvest small game, and 31.7% gather wild edible plants. These five variables were aggregated to form an index of natural resource harvesting. Approximately 60% of the respondents plant and harvest their own gardens, 64.5% of the 138 respondents harvested from their own fruit trees, 21.8% raise farm animals, repaired discarded items for sale or own use (43.9%), sold things at yard sales or roadside (12.6%), 68.8% home canned vegetables or fruits, and 89.2% maintained own equipment and car. These latter seven variables were aggregated and used in an index of domestic production.

Respondents were asked to rate a series of 18 motivations of why people participate in natural resource harvesting on their importance each was to the respondent, with "not at all important," coded as 1 to "extreme importance," coded as 5. These were subsequently used in a principle components factor analysis with varimax rotation to reduce the 18 variables to linear combinations of variables representing underlying dimensions of the motivations. The number of components was determined by eigenvalues  $> 1$ , an examination of a scree plot, and interpretability of the components (factors). Factor loading greater than .500 were used to interpret the components. Cronbach alpha was used to assess the reliability of the motivation variables that were used to interpret the components.

A four component (factor) solution was selected as the best fit. The first component "loaded" on motivations related to the pleasure and enjoyment of the activity/experience and being and sharing with others. The first component was labeled as "Affiliative Recreation." The second component is defined by motivations related to self-reliance, independence and providing for self and family, it was labeled "Self-sufficiency." The third component was defined as "Experience Nature." The fourth component was defined by maintenance of "Tradition," and was labeled as such (see Table 1).

The factor scores on these four dimensions were subsequently used in a non-hierarchical cluster analysis to develop a typology of respondents based on the components (factor dimension). K-means cluster analysis runs were used to cluster the respondents into distinct groups or types. A five-cluster solution was selected based on changes in cluster groups and interpretability. Cluster 1 was defined by the relatively high standard deviation units above the mean for the "Affiliative Recreation" component and the .51 standard deviation above the mean on the "Experience Nature" component, this cluster was labeled "Outdoor Recreation." Based on the negative standard deviations units below the mean for the "Affiliative Recreation," component (1.1 sd.) and the 1.3 standard deviation below the mean on the "Experience Nature" component, the second cluster was labeled "Non-Recreation." Cluster 3 was defined by the 1.07 standard deviation units above the mean on "Experience Nature." On the fourth cluster Affiliative Recreation and Tradition were .72 and .50 above the mean respectively, the cluster was labeled as "Recreation Tradition." The fifth cluster was defined by the 1.4 standard deviation units above the mean on "Self-sufficiency." Clusters were then used as a constructed typology to examine respondents with regard to their involvement in natural resource harvesting.

One purpose of this study was to examine if respondents with varying motivations (as separated into "motivation" clusters) differed in natural resource harvesting activity and domestic resource use. A one-way ANOVA was used to compare the natural resource harvesting index scores of the five cluster types. A significant difference was found among the types ( $F(4, 99) = 2.836, p = .028$ ). Tukey's HSD was used to determine the nature of the difference among the types. This analysis revealed the Self-sufficiency type (cluster) had a higher harvest activity ( $m = 1.43, sd = 1.47$ ), than the Non-recreation oriented type ( $m = .222, sd = .73$ ). The other three types did not significantly differ from these two nor were statistically significant differences observed among the three other types.

**Table 1. Motivational Components for Engaging in Natural Resource Harvesting**

Motivation	Component			
	Affiliative Recreation	Self-sufficiency	Experience Nature	Tradition
Experience fun & pleasure of activity	.824			
Participate in a favorite outdoor activity	.816			
Do something exciting & challenging	.740			
Have an enjoyable experience	.630		.582	
Share skills & knowledge with others	.604			
Be with friend who do the activity	.596			
Share experiences with my family	.556			
To be self-reliant		.897		
Provide food for my family		.873		
To be independent		.825		
Provide income for self & family		.740		
Observe nature			.812	
Learn about nature			.807	
Maintain family tradition				.775
Maintain rural Danish tradition				.738
Because I have always done it				.649
Cronbach Alpha	.9094	.9010	.9130	.7918

A significant difference was also found among motivation types on domestic resource use ( $F(4, 101) = 3.835, p = .006$ ), using a one-way ANOVA. Tukey's HSD revealed the Experience Nature type ( $m = 4.3, sd = 1.48$ ) differed from the Non-recreation oriented type ( $m = 2.7, sd = 1.45$ ); and similarly the Self-sufficiency type ( $m = 4.2, sd = 1.17$ ) also differed from the Non-recreation type. No other differences among types were found for domestic resource use.

A community attachment index was developed by aggregating scores on ratings of how well they fit into their local community (1 = poorly to 5 = well), how much they have in common with most of the people within their community (1 = nothing to 5 = everything), and ratings of their community in terms of an ideal community in which they would want to live (1 = farthest from ideal to 5 = closest to ideal). An Alpha reliability of .710 was obtained for the three variables of the index.

The community attachment (ATTACH) index was then related to the natural resource harvesting motivations (the four linear components: FAC 1-FAC4 described above), natural resource harvesting index (aggregated harvesting activity: HARVEST), domestic resource production activity (aggregated domestic production activity: DOMESTIC), community satisfaction (SATCOM), and life satisfaction (SATLIF) using multiple linear regression. A significant regression emerged ( $F(8, 93) = 7.177, p < .001$ ), with an adjusted  $R^2$  of .329. Respondents natural resource harvesting is equal to:  $4.755 + .799(\text{HARVEST}) - .079(\text{DOMESTIC}) + .975(\text{SATCOM}) + .313(\text{SATLIF}) -$

$.016(\text{FAC1}) - .148(\text{FAC2}) + .114(\text{FAC3}) + .146(\text{FAC4})$ , where FAC1 is the component of Affiliative Recreation, FAC2 is the Self-sufficiency component, FAC3 is Experience Nature component and FAC4 is the component related to Tradition. Only HARVEST and SATCOM variables appeared to be significantly related. As shown in Table 2, the t values of the regression suggest harvesting of natural resources has the strongest relation to community attachment followed by community satisfaction, and that the other variables ( $t < .2000$ ) do not have a strong relation to attachment.

### Discussion

Motivations can be used to differentiate the rural Danes in this study on natural and domestic resource harvesting, primarily discriminating between those who are motivated by self-sufficiency aspects of harvesting and domestic production from those who are defined by their lack of recreation motives. The respondents motivated by "Self-sufficiency" are, as expected, more engaged in the attenuated harvesting and production activities. The differences among motivational types on other activities, such as bartering and actual consumption of these goods by the households, remains to be tested. Motivational types do appear to be useful for exploring activities and behavior of a rural modern culture such as found in Denmark's Jylland province.

While motivations appear useful for developing a typology and examining harvest activities, they do not appear to be strongly related to community attachment. Rather, actual

**Table 2. Regression Coefficients for Community Attachment Index**

Model	Coefficients		
	$\beta$	$t$	Sig.
(Constant)	4.755	3.836	.000
HARVEST	.799	5.561	.000
DOMESTIC	-.079	-.598	.551
SATCOM	.975	4.017	.000
SATLIF	.313	1.305	.195
FAC1 (Affiliation)	-.016	-.088	.930
FAC2 (Self-suffic)	-.148	-.810	.420
FAC3 (Exp Natur)	.114	.600	.550
FAC4 (Tradition)	.146	.83	.409
Regression	$R^2 = .329$	7.177	.000

engagement in harvesting activities appears to have a more significant and positive relationship with community attachment. Similar to what has been revealed in previous literature, community satisfaction in this study was related to community attachment, but natural resource harvesting appeared to be stronger predictor. The relationship of harvesting to community attachment suggests that the connection to the land and resources may be operating as a place dependent variable. Rural Danes from these three small communities appear to have a functional attachment to community as a result of the access and established relationship they have with the natural resource base of the region. The benefits of such harvest activities are often referred to as "process benefits" (Kruse, 1991) and may be particularly valued for their maintenance of social support and self-reliance (Muth, 1990) in the complexity of modern rural life. The increasing decline of such harvest activities and their meanings for rural residents as a result of policy initiatives (such as increased regulation), land fragmentation, and animal welfare concerns may result in erosion of a significant factor which maintains the fabric of community.

**References**

Kruse, J. A. (1991). Alaska Inupiat subsistence and wage employment patterns: Understanding individual choice. Human Organization, 50, 317-326.

Muth, R. M. (1990). Community stability as social structure: The role of subsistence uses of natural resources in southeast Alaska. In Lee, R. G., Field, D. R., & Burch, Jr., W. R. Community and forestry. Boulder, CO: Westview Press, 211-227.

Relph, E. (1976). Place and placelessness. London: Pion Limited.

Stokols, D., & Shumaker, S. A. (1981). People in place: A transactional view of settings. In Grimm, L. G., & Yarnold, P. R. (Eds.). Cognition, social behavior, and the environment. Hinsdale, NJ: Erlbaum, 441-488.

Tuan, Y.F. (1980). Rootedness versus sense of place. Landscape, 24(1), 3-8.

Williams, D. R., Patterson, M. E., Roggenbuck, J. W., & Watson, A. E. (1992). Beyond the community metaphor: Examining emotional and symbolic attachment to place. Leisure Sciences, 14, 29-46.