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Northeastern Recreation Research Symposium Policy Statement

The Northeastern Recreation Research Symposium seeks to foster quality information exchange between recreation, tourism, and resource managers and researchers throughout the Northeast. The forum provides opportunities for recreation and tourism research managers from different agencies, state, and government levels, as well as those in the private sector to discuss current issues, problems, and research applications in the field. Students and all those interested in continuing education in recreation and tourism management are particularly welcome.

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Proceedings of the 2000 Northeastern Recreation Research Symposium

April 2-4, 2000



On Lake George in Bolton Landing, New York

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The Pennsylvania State University

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Table of Contents

Keynote Address

Discipline and Chaos <i>Tom Goodale</i>	3
--	---

Management and Planning

Recreational Leasing of Industrial Forestlands in New York State <i>Sergio Capozzi and Chad P. Dawson</i>	11
Environmental Attitude-Behavior Correspondence Between Different Types of Forest Recreationists <i>Brijesh Thapa and Alan Graefe</i>	20
Support for Recreational Trail Development and Community Attachment: A Case of the Soucook River Watershed <i>Jodi L. Michaud and Robert A. Robertson</i>	28
Human Territoriality: An Examination of a Construct <i>Thomas D. Wickham and Harry C. Zinn</i>	35
What's Happening in Our Parks? <i>G. Scott Place</i>	40
Open Space and Imagination <i>G. Scott Place and Bruce Hronek</i>	43

Economics of Outdoor Recreation and Tourism

Opinions of Elk Viewers on a Proposed Pennsylvania Elk Hunt <i>Bruce E. Lord, Charles H. Strauss, and Walter M. Tzilkowski</i>	49
The Role of Non Timber Forest Products: A Case Study of Gatherers in the Eastern United States <i>Siri Doble and Marla Emery</i>	53
Degraded Visibility and Visitor Behavior: The Case of New Hampshire's White Mountain National Forest <i>John M. Halstead, Wendy Harper, and L. Bruce Hill</i>	58
Estimating Relative Values for Multiple Objectives on Private Forests <i>Donald F. Dennis, Thomas H. Stevens, David B. Kittredge, and Mark G. Rickenbach</i>	64
Cost Consideration as a Factor Affecting Recreation Site Decisions <i>Allan Marsinko, John Dwyer, and Herb Schroeder</i>	68
Attendance Structure and Economic Impact of the National Road Festival <i>Charles H. Strauss and Bruce E. Lord</i>	74

Tourism

A Comparison of Tourists and Local Visitors to National Estuarine Research Reserve Sites <i>Allan Marsinko, William C. Norman, and Tiffany J. McClinton</i>	83
Individuals' Interpretation of Constraints: A New Perspective on Existing Theory <i>Po-Ju Chen, Deborah Kerstetter, and Linda Caldwell</i>	89
Culture, Heritage and Tourism Destination Choices <i>Achana Francis, Joseph T. O'Leary, and Alastair Morrison</i>	94

A Measurement of the Experience Preferences of Central Appalachian Mountain Bicyclists <i>Roy Ramthun and Jefferson D. Armistead</i>	104
---	-----

Effect of Balanced Information on Attitudes Towards Open Ocean Aquaculture Development in New England <i>Robert A. Robertson and Erika L. Carlsen</i>	107
--	-----

Characteristics of Outdoor Recreationists

Use and Users of the Appalachian Trail: A Geographic Study <i>Robert E. Manning, William Valliere, Jim Bacon, Alan Graefe, Gerard Kyle, and Rita Hennessy</i>	115
--	-----

A Comparison of Recreation Conflict Factors For Different Water-Based Recreational Activities <i>Cheng-Ping Wang and Chad P. Dawson</i>	121
--	-----

SCUBA Diving & Underwater Cultural Resources: Differences in Environmental Beliefs, Ascriptions of Responsibility, and Management Preferences Based on Level of Development <i>Sharon L. Todd, Tiffany Cooper, and Alan R. Graefe</i>	131
--	-----

Ethnicity and Culture

Recreation Safety in Municipal Parks - Bloomington, Indiana and Tsukuba, Japan: A Comparison Study of Risk Management <i>Bruce Hronek</i>	143
--	-----

The Meaning of Leisure: Conceptual Differences Between Americans and Koreans <i>Joohyun Lee, Sae-Sook Oh, and Jae-Myung Shim</i>	145
---	-----

Universal Campsite Design: An Opportunity for Adaptive Management <i>Jason R. Biscoombe, Jeri E. Hall, and James F. Palmer</i>	150
---	-----

A Life to Risk: Cultural Differences in Motivations to Climb Among Elite Male Mountaineers <i>Patrick T. Maher and Tom G. Potter</i>	155
---	-----

Outdoor Recreation Behaviors and Preferences of Urban Racial/Ethnic Groups: An Example from the Chicago Area <i>John F. Dwyer and Susan C. Barro</i>	159
---	-----

Methodological Issues

Evaluating Multiple Dimensions of Visitors' Tradeoffs Between Access and Crowding at Arches National Park Using Indifference Curve Analysis <i>Steven R. Lawson and Robert E. Manning</i>	167
--	-----

Effective Survey Automation <i>John Weisberg and Jay Beaman</i>	176
--	-----

Weighting Issues in Recreation Research and in Identifying Support for Resource Conservation Management Alternatives <i>Amy L. Sheaffer, Jay Beaman, Joseph T. O'Leary, Rebecca L. Williams, and Doran M. Mason</i>	183
--	-----

Intervention for the Collaborative Use of Geographic Information Systems by Private Forest Landowners: A Meaning-Centered Perspective <i>Kirk Sinclair and Barbara A Knuth</i>	187
---	-----

Estimating Social Carrying Capacity Through Computer Simulation Modeling: An Application to Arches National Park, Utah <i>Benjamin Wang, Robert E. Manning, Steven R. Lawson, and William A. Valliere</i>	193
--	-----

Does the Suggestion That Respondents Recall Events Chronologically Significantly Influence the Data Collected? <i>Andrew Hill, Jay Beaman, and Joseph O'Leary</i>	201
--	-----

Marketing and Management in Outdoor Recreation and Tourism

Importance-Performance Analysis: An Application to Michigan's Natural Resources <i>Gloria Sanders, Erin White, and Lori Pennington-Gray</i>	207
--	-----

Poster Session

The Eastern States Exposition: An Exploration of Big E Tourist Expenditures <i>Robert S. Bristow and Heather Cantillon</i>	213
Sustainable Tourism Development: The Case Study of Antalya, Turkey <i>Latif Gurkan Kaya and Richard Smardon</i>	222
The Role of Avocational Archaeology and History in Managing Underwater Cultural Resources: A Michigan Case Study <i>Gail A. Vander Stoep</i>	228
Tornado Chasing: An Introduction to Risk Tourism Opportunities <i>Heather Cantillon and Robert Bristow</i>	234
Community Based Open Space Planning: Applications of a GIS <i>Christian Mettey, Brian Demers, Nicole Halper, Robert Bristow, and Stephanie Kelly</i>	240
A Spatial Analysis of Wilderness Campsites in Lyell Canyon, Yosemite National Park <i>Steven R. Lawson and Peter Newman</i>	245

Management Presentation

Interpretation Programming in the NYS Forest Preserve Campgrounds: Successful Consensus Building, Partnership, and Regional Management <i>W. Douglas Fitzgerald</i>	251
Don't Be Thru-Hiking; Start Uhiking <i>Kirk D. Sinclair</i>	256
Using Technology to Develop Connections Between Individuals, Natural Resources, and Recreation <i>Wen-Huei Chang, Carolyn H. Fisher, and Mark P. Gleason</i>	260
Monitoring Visitor Satisfaction: A Comparison of Comment Cards and More In-Depth Surveys <i>Alan R. Graefe, James D. Absher, and Robert C. Burns</i>	265

Roundtables

The Forest Service's Recreation Agenda: Comments on the Roles of Research and State and Private Forestry in the Northeast <i>Thomas A. More and Mark J. Twery</i>	273
Development of a Use Estimation Process at a Metropolitan Park District <i>Andrew J. Mowen</i>	276
Nature Speaks - An Exploratory Study of Nature as Inspiration <i>Will LaPage</i>	278
Great Gulf Wilderness Use Estimation: Comparisons from 1976, 1989, and 1999 <i>Chad P. Dawson, Mark Simon, Rebecca Oreskes, and Gary Davis</i>	283
New England's Travel & Tourism Markets: Trends in the Geographic Target Markets in the 90's <i>Rodeny B. Warnick</i>	289

Founder's Forum

Notes on My Trip Through Nebraska, or Some Alternative marketing Principles for Parks and Recreation

Alan R. Graefe 301

Index of Authors 307

Keynote Address

KEYNOTE ADDRESS: DISCIPLINE AND CHAOS

Tom Goodale

There is no poetry in NERR Proceedings. So I'm going to rectify that and start with a few lines from a poem by W.H. Auden that have both amused and taunted me since I read them over 30 years ago. Entitled, "Under Which Lyre," it was the Phi Beta Kappa poem, delivered at Harvard University, in 1946. Auden compared the lyres of Apollo and Hermes to convey his concerns with changes he saw happening in America's universities. Two verses in early parts in the piece establish the main point, followed by Auden's advice in the closing verses.

The sons of Hermes love to play,
And only do their best when they
Are told they oughtn't;
Apollo's children never shrink
From boring jobs but have to think
Their work important.

Then, speaking of Apollo's child:
And when he occupies a college,
Truth is replaced by Useful Knowledge;
He pays particular
Attention to Commercial Thought,
Public Relations, Hygiene, Sport
In his curricula.

Next, speaking of the venerable scholars:

In our morale must lie our strength:
So, that we may behold at length
Routed Apollo's
Battalions melt away like fog,
Keep well the Hermetic Decalogue,
Which runs as follows:

Thou shalt not do as the dean pleases,
Thou shalt not write thy doctor's thesis
On education
Thou shalt not worship projects nor
Shall thou or thine bow down before
Administration.

Thou shalt not answer questionnaires
Or quizzes upon World-Affairs,
Nor with compliance
Take any test. Thou shalt not sit
With statisticians nor commit

A social science.

Thou shalt not be on friendly terms
With guys in advertising firms (and so on. Add
this poem to your must read list)

Auden expressed the view of a brilliant humanist as the university tilted toward the "useful," but a useful dramatically limited to producing workers while reducing the role and stature of the humanities; history, philosophy,

literature and the arts, which expose us to a common heritage of political, social and ethical growth, a common humanity and a common civility. Education for work can fall short of education for citizenship. Good workers are not automatically good citizens.

Our own work is based on discipline, as a personal trait as well as mastery of content and method, and we do it well. But we do it in a milieu, which seems increasingly chaotic; perhaps even insane. You need no reminder that this is the wealthiest country in the world, and we like to believe, the most democratic and also best educated. If so, how can we explain:

1. Twenty percent of the nation's children on or below the poverty line.
2. Over two million people in jail; more people in jail in California than in all
3. of Great Britain and Germany combined (Gray, 1998:116).
4. Two hundred million guns in private hands and nine times more child homicides than in the next fifteen industrialized nations combined.
5. Consumers not having the right to know if the food they buy has been genetically altered or the milk they drink from cows fed rBGH.
6. As of December, 1999, 10 out of 10 international trade disputes involving the environment or public health were settled by requiring one of the nations to weaken its regulations.
7. Accepting a standard of levels for lead in children's blood (10 mcg/dL) known to impair hearing and diminish IQ scores 4-7%.
8. Street crime costing about \$3.8 billion annually and corporate crime costing an estimated \$3 trillion (Franklin, 1999:1).
9. To pay market rent for a two bedroom apartment would require increasing the minimum wage 171% nationwide, and from 300 to 430% in large metropolitan areas.

These mere eight items barely scratch the surface and everyone here knows that. Still, we who are disciplined and work too many hours carry on, loyal and congenial troopers amidst the chaos – if not insanity. Are those matters not our business? Are we too busy? Or, as Thoreau suggested, perhaps we don't care.

Nearly everyone here works for government at some level, or for a university that derives at least some support from taxes. To serve the public has always been a noble ideal, one to which we cling despite a sense of being compromised beyond recognition. Intellectually independent people saying what the evidence leads them to often become pariahs. We brand them misfits, but amidst chaos and insanity the misfits are the rational ones no longer able to toe the institutional line. In How Institutions Think, Mary Douglas (1986:32) observed that, "for us, the hope of intellectual independence is to resist, and the first step in resistance is to discover how the institutional grip is laid upon a person's mind."

Those in government see the institutional grip in their agencies. Universities are not immune: "Thou shalt not (Auden said) do as the Dean pleases." But more is involved than agency culture or tradition. The encompassing and powerful grip is that of our economic institutions and the contamination of politics by libertarian economic dogma.

Suppose we accepted the argument that we work not for a democratic government but an oligarchy. As Lewis Lapham (1996:35) observed, we have a permanent and a provisional government, and should not confuse the two:

The permanent government, a secular oligarchy ..., comprises the Fortune 500 companies and their attendant lobbyists, the big media and entertainment syndicates, the civil and military services, the larger research universities and law firms. It is this government that hires the country's politicians and sets the terms and conditions under which the country's citizens can exercise their right - God given but increasingly expensive - to life, liberty and the pursuit of happiness. Obedient to the rule of men, not laws, the permanent government oversees the production of wealth, builds cities, manufactures goods, raises capital, fixes prices, shapes the landscape, reserves the right to assume debt, poison rivers, cheat the customers, receive the gifts of federal subsidy, and speak to the American people in the language of low motive and base emotion.

The provisional government is the spiritual democracy that comes and goes on the trend of a political season and oversees the production of pageants. (And so on. Add this article to your must read list too).

There is nothing new about this except for the growth and concentration of oligarchic power. By a protracted but not bloodless coup, it now controls the media as it does the military, as well as the government and the political process. There is time only to sketch how this came about, and the consequences.

A central source of power is the contamination of political philosophy by libertarian economic dogma. This has been legitimized by academic economists promoting Public Choice theory and its adopted child, Law and Economics. Public Choice theory applies free-market assumptions to politics starting with the assumptions that all parties to government are self-interested, and that government is just another free-market where we compete as equals. To these fundamental but faulty assumptions is added the argument that markets are rational, efficient, and self-regulating, and while admitting that sometimes markets fail, since they self-correct government must leave them alone. Because when government intercedes, the theory goes, it inevitably makes matters worse. All this is couched in innocuous, often patronizing language and camouflaged in formulas and mathematical models that give the appearance of hard, quantitative science. "Even if the results are trivial,

formalistic, and tautological, and when they are falsified, the proponents can argue (as Public Choice scholars often do), 'At least we try to be scientific'" (Kuttner 1999:341).

Public Choice theory gains currency partly because we are by tradition skeptical of government and fearful of its power, but mainly because libertarian economics is congenial to the oligarchy, since it discredits everything except laissez-faire. One result has been deregulation, thus increasingly concentrated wealth and power in a "winner-take-all" economy. Another result is oligarchic control of the political process. Campaign finance is just one of the weapons in the oligarchs' arsenal. Since a half-dozen syndicates control more than half of the nation's media outlets (AT&T; Viacom/CBS; Disney/ABC/Capital Cities; AOL/Time Warner; Murdoch's News Corporation; Westinghouse) and since much of the cost of modern campaigns is for TV ads, public elections mean handing over huge sums to the syndicate for use of the public's air waves. Deregulation has also made a mockery of the public interest criteria in licensing stations or regulating content. And government support for public radio has been slashed to \$250 million dollars, a small fraction of what other democratic nations spend. A more blatant display of the media syndicate's power is noted later.

Private control of the media also mean that although some reporters may be liberal, the media are profoundly conservative. Cheap, cynical shots at government and civil servants are commonplace (cf. Crenshaw, 2000). Further, not only does television destroy civic capital -about which economics is mute - it also reduces political discourse to sound bites, which is why television news is an oxymoron, and why Mario Cuomo failed at talk radio while Rush Limbaugh and G. Gordon Liddy succeed.

Much of the degradation of political democracy is the result precisely of market forms and norms taking over the political process. A prime culprit is television, a medium first of marketing, and second of purveying entertainment useful for delivering mass audiences to a sponsor. Education and deliberation, much less civic uplift, are not part of this equation (Kuttner, 1996:348).

The absence of information and reflection is compounded by a pervasive dishonesty; attack ads and deliberate distortions of political campaigns, base appeals and deliberate deceptions of commercial speech and image. Beyond being shameless, "The real evil that follows a commercial dishonesty so general as ours is the intellectual dishonesty it generates" (Chapman, in Lapham, 1998:8).

The university has its own forms of dishonesty and has contributed to our current state in other ways. It legitimized Public Choice theory and programs on Law and Economics. It entertained deconstructionists who trashed the past, undermined any foundation for determining what is true, gave all opinions equal status and created an intellectual egalitarianism devoid of standards. This reinforced psychology, which is individualistic and perception oriented, which in turn reinforced the marketers

who serve providers rather than the public, and produce consumers rather than citizens.

In sum, the argument that Lapham, Kuttner, and scores of others make is that libertarian economic ideology congenial to the wealthy and powerful has transformed democracy into an oligarchy which includes media syndicates which are anti-government, degrade political discourse, and feed on dishonest words and images designed to manipulate consumers. Though expressed paternalistically, this is the institutional line gripping our minds.

What does all this have to do with NERR and recreation research? Well to begin, we are disciplined in both subject and behavior but, amidst chaos and insanity, what difference does it make? Are we applying our discipline in the service of the public or are we servants of an oligarchy? To what extent has the institutional grip seized our minds? Have we yielded our intellectual independence to the powers that be?

The institutional grip has impacted our fields in many ways. College and university programs have changed even more than W.H. Auden feared. Corporate largess shapes university priorities. Public education at all levels is being privatized, a dangerous development. Professors become entrepreneurs or migrant laborers. Students and parents pay more tuition and fees, making them sovereign consumers, "demanding economic value in return: entertainment, high grades, relevance, job preparation, certification for admission to professional schools" (Kernan, 1999:277). In the public land managing agencies this means more commercial activity, more marketing, and of course more revenue generation via fees. The "fee demonstration project" is the inevitable result of an oligarchy at work and a clear reflection of the institutional grip on both agency and individual minds. But it is more than that.

While Auden's poem has amused and taunted me for more than 30 years, Peter Berger's (1963) words have haunted me almost as long, and haunt me today. Berger, born in Austria, came to the US in his teens and served two years in the US Army. Later, at the height of the cold war and attendant arms race, he wrote about "sociological Machiavellianism" as follows: "As the physicists are busy engineering the world's annihilation, the social scientists can be entrusted with the smaller mission of engineering the world's consent" (p.152). This, he said, was not necessarily the result of unseemly purpose but perhaps having no purpose other than to serve the powers that be. The "fee demonstration project" is hardly about annihilation but is a clear example, a particularly egregious one, of engineering consent, in this case to pay without complaint another regressive tax. And it appears to serve the powers that be.

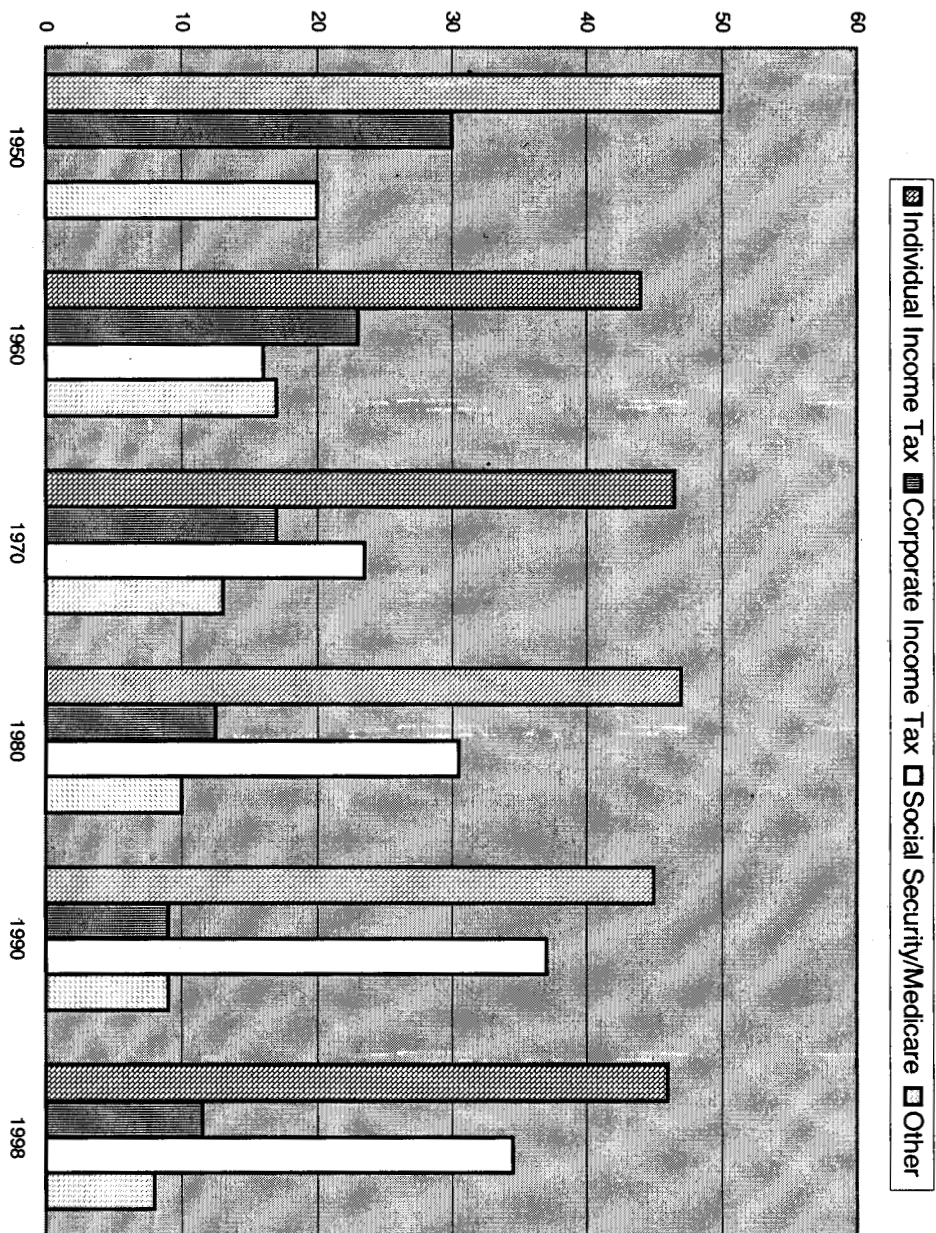
The actual charge to the agencies says thou shalt "demonstrate the feasibility of user generated cost recovery." "Demonstrate," not inquire into, not look for relationships, not sharpen researchable questions or testable hypotheses, not contribute to the development of theory -

i.e. not to do research but to engineer uncomplaining willingness to be taxed. That is very clear in several articles in the special issues of the Journal of Leisure Research (31:3, 1999) and Journal of Park and Recreation Administration (17:3, 1999) edited by Alan Watson. Alan expressed clearly his reservations about economics driving policy at the exclusion of all else, and about the proper role of scientists. Others were less squeamish. Let me cite (without attribution) one of dozens of examples. "Managers equipped with an understanding of the likely public response are better positioned to develop programs with a greater likelihood of acceptance and compliance."

Demonstrating the feasibility of user generated cost recovery is troublesome for many reasons. First, it compromises science and adds to the public's growing suspicion of science as self-serving and manipulative. Second, the premise that there is no money for maintenance, etc. is, quite simply, silly. George Bush's statement, "we have more will than wallet" could not have been more wrong. The exact opposite is true. The permanent government, the oligarchy, is all wallet and no will, at least no will to serve the public. Third, then, is the disconcerting realization that we may no longer be public servants in a democratic government. Fourth, demonstrating feasibility by ascertaining and then reshaping perceptions may engineer consent but should not be used in forming or rationalizing policy. Policy should be based on information and understanding. Suppose respondents' perceptions are not well informed? Should poorly informed perceptions be accorded any status at all, much used to form or rationalize policy?

Before answering questions about paying fees suppose respondents recalled that not long ago the permanent oligarchy in Washington, in a quiet display of raw power, gave away to their media brethren air-wave frequencies that should and could have been sold at auction for \$70 billion dollars. That single act added a thousand dollars to the tax burden of every family in America (Scheuen, 1988:44). Suppose we posed this question, "Which do you think is more fair, charging you \$1,000 in admission fees or charging giant corporations, those earnest champions of free markets, the free-market price for the right to use air-waves that belong to you and me?"

Federal Government Receipts - Percentages



Suppose respondents remembered that Allied-Signal Corporation sold a subsidiary for \$450 million and had a tax bill for \$150 million. Then accountants at Merrill Lynch figured out a scheme involving a foreign "partner" to help manipulate securities, interest rates, etc., effectively converting a \$150 million liability into a \$50 million tax-credit, thus evading \$200 million in taxes. That is only one company and only one swindle. Suppose respondents had just read that the IRS acknowledges being owed \$231 billion in back taxes and penalties. Suppose respondents converted that into \$10 per car entrance fees. Every family in America could have 10 free visits each year for the next 26 years.

Suppose respondents knew that corporate taxes, as a percent of total government receipts, have shrunk from 30% in 1950 to 11 ½% in 1998 (Statistical Abstract[s] of the United States). Suppose respondents knew of the parallel decline in the corporate share of local property tax revenue, from approximately 45% in 1970 to about 16% in 1990 (Reich, R. in D. Berliner and B. Biddle, 1995:85). The slight increase in the corporate share of federal receipts since 1990 is the result of unprecedented corporate earnings. Massive as they were, it appears they were underreported. Corporations capitalized a billion dollars or more are either lying to their shareholders or to the IRS. In 1992, for example, they reported income of \$420 billion to shareholders but only \$301 billion to the IRS, a difference of \$119 billion. A modest 28% tax on the amount not reported to the IRS pays the \$10 fee 10 times a year for every family in America for six years. And that's only a modest tax on only the unreported income and only for one year

Within the narrow confines of our field, our agency homes and our jobs, a little fee here and a small charge there can be made palatable by some social scientists applying some marketing tools. The engineering of consent is not annihilation but it is also not science and it is not public service. It is a reflection of the institutional grip of libertarian economics on a person's mind. Absent discovery of and resistance to that grip, discipline amidst chaos becomes the norm, and intellectual independence an even greater need.

One can commit a social science. Even psychologists are beginning to question those of their colleagues who sell their services to businesses that pitch products at young children. Is engineering willing consent to pay fees not also to be vigorously challenged? And while the gross inequities in the tax burden and gross disparities in wealth make this a particularly egregious example, the greater problem is using science for purposes not its own. The public's interests, I believe, can only be served by academics and public servants who maintain intellectual independence in the face of institutional powers that are more pervasive than we care to know or are ready to admit.

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Management & Planning

RECREATIONAL LEASING OF INDUSTRIAL FORESTLANDS IN NEW YORK STATE

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Abstract: An exploratory and descriptive study of recreational leasing of industrial forestlands in the state of New York was conducted to better understand lease programs and the lessees involved in these programs. During the summer of 1999, thirteen companies were sent mail surveys and 9 responded (response rate of 69%). Based on information provided by the companies, 540 industrial forestland leaseholders were sent mail surveys and 362 leaseholders responded (deliverable response rate of 68%). Leased forestlands for outdoor recreation accounted for nearly 75% of the total forestland area owned and managed by the companies who responded to the survey. General industrial forest company and leaseholder characteristics were described and specific relationships were tested. Industrial forest managers can use this type of information to better manage their lands for producing quality outdoor recreation experiences in addition to traditional commercial forest products.

Introduction

In the State of New York, 93% of all forestlands are privately owned. Non-industrial private forestland owners account for the majority of these lands. Industrial forest companies own only 8% of private forestlands in New York, approximately 1.2 million acres (Germain 1999). While this may seem like a small amount, it is important as large industrial owners provide the public with more contiguous acres of forestland than non-industrial owners (Owen 1990, Patterson and Patterson 1989). Most of these lands are open to the public either through free access or recreational leases. Nearly 70% of industrial forestlands are currently leased for recreation (Germain 1999).

A recreational lease is a legal contract transferring use of all or a portion of an industrial forest company's property to a leaseholder for outdoor recreation purposes during a specific period of time at an agreed upon fee. Both the company and the leaseholder have specific rights and responsibilities regarding the maintenance of the land and what types of activities are allowed. Industrial forest companies generate income from recreational lease programs typically to pay for the annual operational costs of owning and managing forestlands, but also benefit from having better control of access to their lands and from some labor assistance from lessees who can act as stewards of the

land. While lessees must pay for access to the land, they benefit from increased recreational opportunities and often exclusive use of the land, with less crowded experiences than at many public recreation areas.

Most research dealing with recreational leasing of industrial forestlands has focused on hunting and wildlife management and not on other aspects of the lease programs (Busch and Guynn 1988, Leopold 1930, Pope et al. 1984). This is due to the fact that hunting has traditionally been the primary activity on leased industrial forestlands (Decker and Brown 1979, Johnson 1995). In New York, hunting continues to be the primary recreation activity (Capozzi et al. 1999, Germain 1999). There is an increasing demand for more non-consumptive activities such as hiking, camping, observing wildlife, and general family use. Due to these emerging demands, there is the potential for increased outdoor recreational use of industrial forestlands.

While industrial forestlands have a high potential for outdoor recreation, little is known about the actual amount, types, and recreational use on these lands. Also, there is a lack of information regarding the leaseholders involved in recreational lease programs. The purpose of this exploratory and descriptive study is to develop an understanding of industrial forest company recreational lease programs and the participants in these programs. This type of information is extremely important to managing a successful lease program, as success is based on meeting the needs and wants of current and potential leaseholders while managing for commercial forest products.

Methods

Industrial forestland recreational leasing programs in the State of New York were studied in 1999 to better understand specific aspects of these programs. Both industrial forestland managers and leaseholders were surveyed through the use of a mail questionnaire. A modified Dillman mail survey technique was used with up to two reminders being sent to nonrespondents of the first mailing to ensure a high return rate (Salant and Dillman 1994). Thirteen companies were identified from previous research (Germain 1999) as having recreational lease programs and mailed an industrial forest manager survey. Nine companies responded, resulting in a response rate of 69%. Responding companies were requested to provide lists of their leaseholders in order to survey their use of industrial forestlands.

Due to the varying number of lessees involved with each company, some industrial forestland companies provided a census of their lessees while others provided simple random samples of lessees. In total, 540 lessees were mailed surveys and 362 responded, resulting in a deliverable response rate of 68%. Dolsen and Machlis (1991) have indicated that when surveying a relatively homogeneous population, a 65% respond rate should be adequate to rule out any substantial response bias. Brown and Wilkins (1978) have pointed out that even when surveying a specific audience in a specific resource area about specific issues, while the non-response bias may be

lower with a high response rate, it nonetheless can still exist.

In order to assess the possibility of a non-response bias in the leaseholder survey, four variables (age, education, income, and overall satisfaction) were tested. Nonresponse bias was tested by comparing the means of four variables during the three response periods (after the first mailing, after the first reminder, after the second reminder). It should not be assumed that late respondents, those responding to reminder letters, are representative of actual nonrespondents and some response bias may still exist using this method (Brown et al. 1981). However, given a specific recreation activity and location, a homogeneous population can be assumed if the response period means for specific key variables are similar. If a homogeneous population is assumed, then non-response bias can also be assumed to be low (Becker et al. 1987, Becker and Iliff 1983).

Data was entered and all statistical tests were conducted using the Statistical Package for the Social Sciences (SPSS version 10.0 for Windows). Analysis procedures included chi-square, correlation, and independent sample t-tests. Additionally, an exploratory factor analysis using orthogonal varimax rotation was conducted on the lessee motivation statements to reduce the motivation statements

into meaningful factors. The criteria established for inclusion in a factor were: (1) motivation statement factor loadings had to be 0.40 or greater to be included and (2) Eigenvalues had to be 1.0 or greater to retain a factor (factors were not forced). The internal reliability of each factor was tested and retained if its Cronbach's alpha was 0.60 or greater because each factor should explain at least 60% of the total variance.

Results and Discussion

Nonresponse Bias

Using a Chi-square test, no significant differences were found between return period and age, income, and overall satisfaction (Table 1). There was a statistical difference between return period and education. Past studies have theorized that respondents with higher educations were more likely to respond to surveys (Wellman et al. 1980). A Spearman's rho correlation coefficient of -0.13 (significant at $p < 0.01$) was found between return period and education indicating a weak linear relationship between these two variables. Due to the weak nature of this correlation and the lack of statistically significant differences in the other three variables, it will be assumed that the respondents are a generally homogeneous population and nonresponse bias will not be considered significant for this study.

Table 1. Chi-square tests comparing mail survey return period with age, education, income, and overall satisfaction of respondents.

Variable over Return Period Comparison	Pearson's Chi-Square Value	N	Degrees of Freedom	P
Age	3.56	337	4	0.469
Education	12.78	335	6	0.047 ^a
Income	9.87	304	12	0.627
Overall Satisfaction	6.65	339	4	0.156

^a Chi-square statistic significant at $p < 0.05$.

Industrial Forestland Company Survey

The total number of industrial forest acres involved in the study was 646,672. Of the total acres, recreational leases cover 558,048 acres, 65,573 acres are open to the public without fee, and 18,101 are opened by easements. Additionally, 45,975 acres of the total acreage in the study are completely closed to public access (Table 2). These

amounts exceed the 646,672 total acres because some companies have land that is both leased non-exclusively and is also open to the public for no fee. In general, companies have 75% of their land in recreational leases, 27% open to the public without fee, 14% completely closed to public use, and 5% covered by easements (Table 2).

Table 2. Total acres per access category^a, mean acres per company per access category^a, and mean percentage per industrial forest company.

Access Category	Total Acres in Study	Mean Acres per Company	Mean Percentage per Company
Recreational Lease	558,048	62,005	75%
Open without Fee	65,573	7,286	27%
Easement	18,101	2,011	5%
Closed	45,975	5,108	14%
Total Acres	646,672	71,852	-

^a Categories add to more than total acres due to acres being classified as non-exclusive leases and open without fee.

The relationship between total acres owned by a company and the number of acres that are recreationally leased (Pearson correlation coefficient of 0.991, significant at $p < 0.01$) was a strong positive linear relationship. While not as strong, the relationships between total acres and acres

open without fee and total acres and acres closed to public access were also found to have positive linear relationships (Pearson correlation coefficients of 0.752 and 0.751 respectively, significant at $p < 0.01$). In all three cases, acres in each recreational access category (recreational lease,

open without fee, and closed) increased as the number of acres owned by the company increased. The only access category in which this was not the case was with easements.

A 6-point Likert-type scale was used to question companies about their perception of problems and the actual frequency of problems associated with recreational leasing. The response categories ranged from 0 = "not a problem" to 5 = "very serious problem" for the perception scale and from 0

= "never" to 5 = "very frequently" for the frequency scale. The average perception ratings for illegal construction, trespassing, and road damage were highest (1.67, 1.44, and 1.11). The average frequency ratings for trespassing, lessee interference with logging activities, and illegal construction were highest (1.89, 1.44, and 1.44). None of the 12 variables scored very high perception or frequency ratings indicating that traditional problems associated with public use of private lands may not be issues of contention in recreational lease programs (Table 3).

Table 3. The average perceived problem ratings, frequency of problem ratings, and multiplied ratings for industrial forestland manager perceived and frequency responses.

Variable	Perceived Problem Rating Mean (P)	Frequency of Problem Rating Mean (F)	Multiplied Mean (P * F)
Litter	.78	1.33	1.04 ^b
Illegal Firewood Cutting	.56	.89	0.50 ^a
Road Damage	1.11	1.22	1.35 ^a
Forest or Brush Fires	.00	.11	0.00
Timber Damage	.44	.78	0.34 ^b
Trespassing	1.44	1.89	2.72 ^b
Lessee Interference with Logging Activities	.78	1.44	1.12 ^a
Timber Theft	.11	.44	0.05
Illegal Construction	1.67	1.44	2.40 ^b
Personal Liability	1.00	.67	0.67 ^b
Equipment Damage	.44	.56	0.25 ^b
Vandalism	1.00	1.22	1.22 ^a

^a Correlation is significant at $p < 0.05$ level (2-tailed).

^b Correlation is significant at $p < 0.01$ level (2-tailed).

Due to the small sample size of companies participating in the study ($n=9$), determining if there was a correlation between a company's perception and the actual frequency of the problem was difficult. Spearman's rho correlation coefficients were determined based on the categorical nature of the data and most variables were found to have positive linear associations with varying degrees of strength. Perceived problem means and problem frequency means were also multiplied to provide an exponential scale in which the magnitude of problems could be compared. Multiplied means could range from 0 to 25 (Table 3). Trespassing, illegal construction, and road damage had the highest multiplied mean ratings (2.72, 2.40, and 1.35). These mean ratings are relatively low considering the results could range from 0 to 25, but do indicate that of the related problems, these three are considered possible points of contention for recreational lease programs. Forest or brush fires, timber theft, and equipment damage had the smallest multiplied mean ratings (Table 3). The low mean ratings indicate these problems may not be issues companies must deal with in their recreational lease programs. It appears that the traditional problems associated with public recreational use of private lands are

not large problems in the recreational lease programs involved in this study.

In regard to problems associated with public use of private lands, industrial forest managers were asked about their satisfaction with New York State private property rights legislation. Most industrial forestland companies were not satisfied with current state legislation. The five response categories and response percentages were as follows: very satisfied (0%), satisfied (11%), neutral (33%), dissatisfied (45%), and very dissatisfied (11%). When asked specifically what area of state legislation needed the most improvement, 45% of industrial forestland managers responded landowner liability laws. Twenty-two percent of respondents felt that trespass laws needed improvement and another 22% felt that property tax laws needed improvement. While these are concerns for industrial forestland owners, they do not seem to hinder the recreational lease programs involved in this study, but the situation could prove problematic in the future if company concern increases.

When questioned about the future of public use of private lands, all companies believe public recreational use of

industrial forestlands in New York will increase. Over 55% of responding companies felt that family use of leased lands would increase in the future. In terms of public access to industrial forestlands, 67% believe there will be an increase in the number of easements and 56% think recreational leasing will increase (Table 4). The fairly large percentage of companies who believe there will be an increase in easements may stem in part from specific events that have happened in New York (e.g., recent easements purchased by the state from industrial forest landowners). Over half of the responding companies indicated that they believe free access will decrease in the future. This is especially important when considering the segment of society that cannot afford a recreational lease. A decrease in the amount of available land for free access will translate to a loss in recreational opportunities for those people who

Table 4. Percentage of companies surveyed who indicated an increase, decrease, or no change for recreational leases, easements, and free access in the future on industrial forestland in NYS.

Access Category	Decrease	Remain the Same	Increase
Recreational leases	0%	44%	56%
Easements	0%	33%	67%
Free Access	56%	22%	22%

Industrial Forest Leaseholder Survey

Due to the possibility that lessees surveyed could either lease land as an individual or as a club representative, lessees were asked to indicate which they were. Of the 362 lessee respondents, 94 responded as individuals, 254 responded as a club representative, and 4 lessees did not answer the question. Independent sample t-tests were performed to test for any differences between lessees responding as individuals and as clubs. There were no statistically significant differences when the means for age, income, education, and overall lease satisfaction were compared. Additionally, when responding as a club representative, lessees were asked to indicate the number of members in their club. Clubs ranged in size from 2 to 220 members, with a mean membership of 18 members, and a study total of 4,623 members.

Based on responses to demographic questions, a typical lessee is male, between the ages of 34-64, with at least a high school diploma, employed, and earning over \$40,000 per year. By far, the majority of respondents were men (99%) and most fit into one of three age categories, 34-44 (24%), 45-54 (35%), and 55-64 (21%). Approximately 40% of respondents had completed high school, 19% had some college experience, and an additional 22% were college graduates. Seventy-seven percent of lessees are employed, another 21% are retired, and roughly 75% of respondents make over \$40,000 per year. This type of demographic information is useful to managers to better understand lessee populations and to tailor marketing strategies to elicit new leaseholders.

Lessees involved in this study were primarily from New York (94%) and most came from communities of less than 25,000 people. More importantly, the majority of lessees

cannot afford leasing and may further the economic argument that recreational leasing only makes land available for those who can afford the lease costs, not the public in general (Heberlein and Davis 1987).

Industrial forestland companies were asked to identify the number of organizations (e.g., hunt and other outdoor recreation clubs) and individuals holding leases on their lands. A total of 470 organizations and 336 individuals were indicated to be recreational leaseholders. This is consistent with the literature that states more industrial forest leaseholders are clubs as opposed to individuals (Busch and Guynn 1988, Jordan and Workman 1989). This is due, in part, to club members, as opposed to individual leaseholders, being able to share the cost of the lease.

live under 150 miles from the land they lease. Only about 13% of respondents live more than 150 miles from the land they lease. This supports the claim in the literature that industrial forestland leasing is considered a local phenomenon, with local being defined as approximately 2 hours driving time from the leased land (Busch and Guynn 1988, Yoho 1981). Additionally, a Spearman's rho correlation coefficient of -0.253 was found between lessee distance from leased land and days spent on leased land. While not very strong, the negative linear relationship is nonetheless significant at the $p < 0.01$ level, indicating use of leased lands decreases as distance from the leased lands increases.

Due to different policies by the companies involved in this study, the duration of a typical lease of industrial forestland ranged from a 1 to 6 month lease (1%) to multiple year leases (99%). The most common leases were of a duration of 1 year (18%), 3 years (40%), and 5 years (23%). The majority of respondents had been involved in industrial forestland recreational leasing for more than 2 to 5 years (Table 5). Overall lease satisfaction ratings varied across the number of years involved in recreational leasing category, with the largest percentage of very satisfied lessees in the 2 to 5 year category (Table 5). Interestingly, a weak negative relationship was found between years involved in leasing and overall lease satisfaction (Spearman's rho correlation coefficient of -0.198, significant at $p < 0.01$). In general, overall lessee satisfaction was high with over 49% of lessees indicating they were satisfied and an additional 36% indicating they were very satisfied with recreational leasing of industrial forestlands. Due to the very low percentage of respondents who indicated they were very dissatisfied (3%), dissatisfied (4%), and neutral (8%), these three response categories

were lumped together into one category to facilitate

statistical analysis.

Table 5. Reported satisfaction by lessees in 1999 and number of years involved in recreational leasing on industrial forestlands.

Satisfaction Rating ^a	Years Involved in Leasing					
	1 Year or Less (n = 22)	2-5 Years (n = 107)	6-10 Years (n = 68)	11-15 Years (n = 38)	16-19 Years (n = 18)	20 Years or More (n = 81)
0	1.5%	3.0%	2.4%	3.0%	0.9%	3.6%
1	2.1%	12.0%	12.6%	5.4%	2.4%	15.0%
2	3.0%	17.1%	5.4%	3.0%	2.1%	5.7%

^a The combined satisfaction rating categories were: 0 = very dissatisfied to neutral, 1 = satisfied, 2 = very satisfied.

The high percentage of respondents who were generally satisfied with their recreational lease of industrial forestlands in 1999 may be due, in part, to the management programs of these lands. Given the fact that many of their leaseholders were hunters, many industrial forest companies implemented wildlife management programs. Of the companies surveyed, 78% responded that they not only have a wildlife management program, but also employ a wildlife biologist either full or part time. Furthermore, 78% of responding companies indicated that they employ a recreation specialist on a full or part time basis. This type of attention to the recreational needs of their users may partially explain why most industrial forestland lessees are satisfied with their leasing experiences.

Lessees were asked to describe their main reasons for recreating on leased forestlands to determine if there was something that specifically distinguished industrial forestlands from other lands. The top three reasons and response percentages were "It is a good place to do the outdoor activities I enjoy" (84%), "I enjoy the exclusive use of this land" (77%), and "I enjoy the place itself" (75%). While enjoying the place itself does not specifically distinguish leased lands from free public lands, exclusive use of the land and being a good place to enjoy outdoor activities are distinguishing features of leased lands. Exclusive use is different from public lands that must be shared. Certain outdoor activities are not allowed or are limited to certain areas of public outdoor recreation destinations, also making leasing of commercial forestlands more attractive.

Recreational leaseholders were asked to rank 14 motivational statements based on their importance for

recreating on leased forestland. A 6-point scale was used, ranging from 0 = not important to 5 = extremely important. When ranked according to their mean importance, the three most important items are related to enjoyment and relaxation (Table 6). For enjoyment (4.47), to get away from daily routines (4.12), and for relaxation and rest (4.09) are the top three items while for physical challenge (1.95), to use recreational equipment (2.41), and to improve outdoor activity skills (2.46) were the lowest rated items.

The factor analysis of the 14 motivation items produced four factors (Table 6). A lack of other studies surveying recreational leaseholder motivations did not allow for comparisons, but knowing the reason why people participate in specific types of recreation gives outdoor recreation managers an understanding of what people want from recreation and insight into how they can provide recreational opportunities that might benefit these people (Manfredo et al. 1996).

The Enjoyment and Relaxation factor includes six items, including the three highest ranked items (Table 6). The items in this factor indicate that industrial forest lessees seek enjoyable, relaxing, and even introspective outdoor experiences while on their leased lands. The Social factor, the second highest factor, was comprised of three items, and indicates that lessees derive enjoyment from sharing their experiences on leased forestlands with friends and family. These two factors suggest that having the leased land to recreate on and sharing social time with family and friends is as or more important to lessees than the actual activities participated in on leased forestlands. This is supported by the lower factor means for both the Stimulation/Physical Fitness and Equipment/Skill factors.

Table 6. Means and factor analysis for motivations of recreational leaseholders in 1999.

Factors and Motivation Items	Factor Loadings	Mean Ratings	Factor Mean	Factor (Cronbach's) Alpha Value
<u>Enjoyment and Relaxation</u>			3.87	0.83
For enjoyment	0.55	4.47		
For relaxation and rest	0.82	4.09		
To get away from daily routines	0.83	4.12		
To experience peace and quiet	0.78	3.98		
To reflect	0.54	2.59		
To spend time in a natural environment	0.56	3.98		
<u>Social</u>			3.67	0.72
To be with family	0.65	3.25		
To be with friends	0.68	3.56		
To be with people with similar values	0.50	3.29		
<u>Stimulation/Physical Fitness</u>			2.52	0.69
For excitement	0.46	2.60		
For exercise	0.82	2.97		
For physical challenge	0.80	1.95		
<u>Equipment/Skills</u>			2.44	0.59
To use recreational equipment	0.81	2.41		
To improve outdoor activity skills	0.59	2.46		

Activities as Indicated by Companies and Leaseholders

Both industrial forestland companies and lessees were asked to rank the most frequently occurring outdoor recreation activities on leased lands. Managers of industrial forestlands ranked big game hunting and snowmobiling as the top two activities and small game hunting, fishing, and cross-country skiing tied as the third most often occurring activities on leased forestlands (Figure 1). Lessees ranked big game hunting, small game hunting, observing wildlife, ATV use, and fishing as the top five activities (Figure 2). Hunting, snowmobiling, and fishing were in the top five activities reported in past studies on recreational use of industrial forestlands in the state of New York (Capozzi et al.1999, Germain 1999). By far, big game hunting eclipsed all other activities as the number one activity on leased forestlands. One hundred percent of managers and 62% of lessees indicated big game hunting as the primary activity. An additional 32% of lessees indicated they participated in big game hunting on leased forestlands, but it was not their primary activity. Accordingly, over 65% of lessee use of leased lands occurs during the fall. While the literature suggests recreational use of industrial forestlands may be shifting towards non-consumptive activities (Capozzi et al.1999, Germain 1999, Patterson and Patterson 1989), these results indicate that the traditional consumptive activities of hunting and fishing still play a major role in the recreational use of these lands.

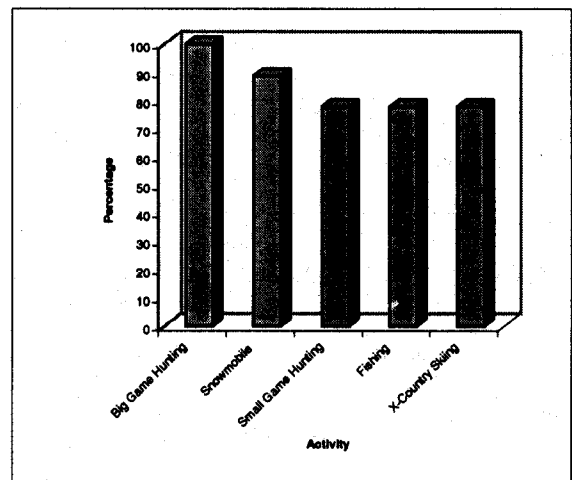


Figure 1. Top five occurring recreational activities according to industrial forestland managers.

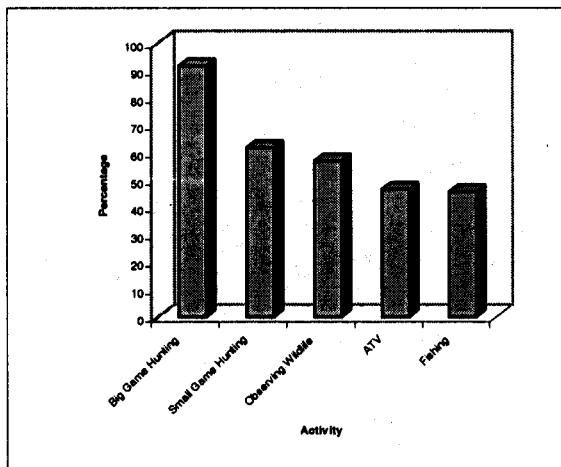


Figure 2. Top five occurring recreational activities according to industrial forestland lessees.

Conclusions

This study was undertaken to provide an understanding of industrial forest company lease programs, the lessees involved in these programs, and the overall satisfaction leaseholders derive from their experience on leased forestlands in New York State. Prior to this research, many recreational lease studies focused entirely on industrial forestlands in the southeastern United States, making generalizations to the Northeast difficult because of the different silvicultural practices in these areas. Additionally, past studies concentrated only on the company side of the lease programs. By adding the leaseholder perspective, this study broadened the base of information available for industrial forest managers to use when developing and managing existing recreational lease programs.

The industrial forest companies involved in this study lease approximately 75% of their total land for recreation, similar to past study results (Marsinko et al. 1997, Stuckey et al. 1992). While recreational access problems (i.e., road damage and illegal timber cutting) can often hinder public use of industrial lands, the analysis of problems associated with recreational leasing, as reported by managers, indicates public use problems do not seem to deter the companies involved in this study from providing recreational leases. Liability is a major concern for industrial forest companies as evident by nearly half of the respondents indicating their dissatisfaction with current landowner liability laws. This concern is similar to that voiced in other studies of recreational leasing of industrial forestlands (Kaiser and Wright 1985, Owen 1990).

While the number of leaseholders varied by company, in general, industrial forest companies in New York tend to lease to a higher percentage of clubs than individual leaseholders and this is consistent with past research (Marsinko et al. 1997, Stuckey et al. 1992). Hunting clubs traditionally were and still are the primary leaseholders of industrial forestlands.

Most leaseholders live less than 150 miles from their leased land, which is similar to past research that has indicated recreational leasing is a local phenomenon (Busch and Guynn 1988, Yoho 1981). The negative linear correlation between distance from lessee's residence to leased land and total days spent on the land, while weak, indicates that as distance from the leased land increases, the number of days the lessee spends on the land decreases. This is an important consideration for possible lessees as their decision to lease land may be predicated on their distance from the leased land and, correspondingly, the time they are able to spend there.

Similar to past research involving recreational leasing of industrial forestlands, the companies and leaseholders involved in this study indicated that big game hunting was the primary activity occurring on leased forestlands (Capozzi et al. 1999, Germain 1999). While non-consumptive activities may be becoming more important on leased lands, hunting is still the main activity, as industrial forestlands provide safe, relatively un-crowded areas to hunt. The similar recreation activity rankings of managers and lessees indicates that industrial forest managers have a good understanding of the activities their lessees are participating in while on their lands.

Leaseholder satisfaction was generally high for the overall lease experience. While this is consistent with past studies that found satisfaction levels for public amenities (i.e., parks) and recreational activities receive high performance ratings (Hollenhorst and Gardner 1994, Manning 1999), it was nonetheless not expected to be as high in this study. A fee must be paid for recreational leasing, whereas other outdoor amenities and activities are generally free or low cost. Considering the cost associated with leasing, it was expected that industrial forest leaseholders would be more critical in their satisfaction ratings and correspondingly satisfaction would be lower than in past studies. The high level of satisfaction was a very positive finding and an indication that industrial forest managers are producing the opportunity for satisfying outdoor recreational experiences on their lands. However, while satisfaction levels were generally high, this could be partially attributed to the fact that highly dissatisfied lessees may have been displaced and not captured in this study (i.e., only satisfied leaseholders continue to lease).

Current management strategies regarding leasing on industrial forestlands seem to be successful. Lessees are primarily satisfied with their experience, possibly due to the fact that many companies specifically employ wildlife and recreation specialists to direct management decisions. Contact with lessees and monitoring their changing preferences and needs should be a priority to companies who want to ensure that lessees of industrial forestlands remain satisfied with their experience.

Further Management Considerations

While recreational leasing appears to be a mutually beneficial venture for both industrial forest companies and leaseholders, two issues provide possible areas for future research. First, given the fact that a fee must be paid when

leasing land, recreational leasing of industrial forestlands is only an option for those people who can afford to pay the fee (Libby 1998, Messmer et al. 1998). A person's ability to pay recreational lease fees is associated with their socioeconomic status (Heberlein and Davis 1987). Given these facts, lease programs make land available for the segment of society that can afford the lease fees. If lease fees increase further, more people will be unable to afford the cost, forcing those who cannot pay to seek a more affordable lease or to use public lands.

A second issue surrounding recreational leasing of industrial forestlands is the willingness of the public to pay recreational lease fees. In general, given the fact that hunters and anglers are accustomed to paying fees for their activities, they have shown a willingness to pay for access to forestlands. Non-consumptive recreationists, on the other hand, have generally not shown this same willingness to pay (Heberlein and Davis 1987). This is especially pertinent to industrial forest lease programs as there has been an overall decrease in the number of people participating in consumptive outdoor activities and an increase in those participating in non-consumptive activities in the U.S. (Cordell et al. 1998). As the number of lessees involved in non-consumptive outdoor recreation increases, industrial forest companies may have to re-evaluate their lease programs and marketing strategies in order to satisfy current lessees and attract new ones.

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ENVIRONMENTAL ATTITUDE-BEHAVIOR CORRESPONDENCE BETWEEN DIFFERENT TYPES OF FOREST RECREATIONISTS

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Abstract: The purpose of this study was to examine the association of participation in outdoor recreation activities and the environmental attitude-behavior correspondence among forest recreationists. Environmental attitudes were operationalized with the revised New Ecological Paradigm (NEP) scale, and behaviors were operationalized using a series of proenvironmental behaviors that were derived from the literature. Outdoor recreation participation represented the respondents' most important activity. Data were collected at Bald Eagle State Forest, located in central Pennsylvania from June 12th 1999- March 11th, 2000. Bivariate correlations (Pearson's *r*) between attitudes and behaviors for appreciative, consumptive and motorized activities were conducted. Those involved with motorized activities showed the highest attitude-behavior contingency for ecocentric, and the lowest for technocentric attitudes. Those involved with appreciative activities generally had higher attitude-behavior consistency than those involved with consumptive activities for all three attitudinal indexes.

Introduction

The 1990s witnessed the highest level of environmentalism in regard to public attitudes; however, environmentally responsible behaviors did not simultaneously increase (Tarrant & Cordell, 1997). Why do people fail to practice environmentally responsible behaviors while, at the same time, expressing attitudes that are supportive of environmental protection? There are a plethora of studies about environmental attitudes and a substantial number that deal with responsible behaviors. However, we have only limited understanding of the causal connection between environmental attitudes and environmentally responsible behaviors. Previous studies have generally found weak or modest relationships between these variables (see Borden & Schettino, 1979; Dunlap & Van Liere, 1978; Gamba & Oskamp, 1994; Gigliotti, 1992; Guagnano, Stern & Dietz, 1995; Hines, Hungerford & Tomera, 1987; Jewell, 1978; Maloney & Ward, 1973; Ostman & Parker, 1987; Oskamp, Harrington, Edwards, Sherwood, Okuda & Swanson, 1991; Scott & Willits, 1994; Tarrant & Cordell, 1997; Thapa, 1999; Van Liere & Dunlap, 1981; Vogel, 1996).

Since outdoor recreationists are in 'direct contact with nature,' it is assumed that their environmental concern and awareness should increase. Furthermore, upon visitation to

the natural environment, outdoor recreationists are exposed to informational and educational programs about environmental issues, which may generate environmental concern and empathy (Dunlap & Heffernan, 1975). However, empirical research has offered somewhat mixed or weak support for the association of participation in outdoor recreation activities and proenvironmental attitudes (Dunlap & Heffernan, 1975; Geisler, Martinson & Wilkening, 1977; Jackson, 1986; Pinhey & Grimes, 1979; Van Liere & Noe, 1981). Nevertheless, two studies show fairly strong support for the association of outdoor recreation and proenvironmental behaviors (Nord et. al., 1998; Theodori et. al., 1998). As a result, some researchers argue that proenvironmental behaviors are a 'better measure' than environmental attitudes in assessing the association or influence of participation in outdoor recreation activities and environmentalism (Nord et. al., 1998; Theodori et. al., 1998). Furthermore, Tarrant and Green (1999) explored the effect of participation in appreciative, consumptive and motorized recreation activities on environmental attitude-behavior correspondence. A mediating effect was demonstrated, in which participation in only appreciative activities (day hiking, backpacking, nature/bird viewing) mediated the environmental attitude-behavior relationship.

Some suggest that the inconsistencies in findings regarding the association of outdoor recreation and proenvironmental attitudes/behaviors are largely due to weak operationalization of key variables and other methodological issues. There is a need for 'better' conceptualization and operationalization of outdoor recreation, environmental attitudes, and other variables. The purpose of this study was to examine the association of participation in outdoor recreation activities and the environmental attitude-behavior correspondence among forest recreationists (appreciative, consumptive and motorized). Appreciative activities represent a preservationist ideology that includes enjoyment of the natural environment without altering it. Consumptive activities refer to a utilitarian ideology that includes taking something from the environment. Motorized activities employ the use of motorized or mechanized equipment during the process of recreation. A research question representing the effect of participation in outdoor recreation activities on environmental attitude-behavior correspondence was formulated:

Is there a difference in environmental attitude-behavior correspondence between different types of forest recreationists (appreciative, consumptive and motorized)?

Methods

This study was conducted at Bald Eagle State Forest, encompassing 195,624 acres within five counties (Clinton, Centre, Mifflin, Snyder and Union) in central Pennsylvania. Due to multiple entry and exit points, the Forest was demarcated into eight zones based upon natural or man-made features. Between 1-3 sampling sites per zone were identified. There were a total of 13 sites, 2 of which were

picnic areas while the others were located on various State Forest roads and intersection points. A combination of survey methods was used to collect the data (on-site interviews and windshield surveys). On-site interviews were conducted from June 12th - October 24th, 1999, while windshield surveys were conducted from October 2nd - March 11th, 2000.

Operationalization of Variables

Environmental attitudes were operationalized with the revised New Ecological Paradigm (NEP) scale, which consisted of 15 items tied to a 5-point Likert Scale format, ranging from Strongly Disagree (1) to Strongly Agree (5) (Dunlap, Van Liere, Mertig, Catton & Howell, 1992). Environmentally Responsible Behaviors were operationalized using a series of proenvironmental behaviors (15 items) juxtaposed in a 5-point Likert Scale format, ranging from Rarely (1) to Usually (5). The items were general items that were derived from the literature (see Scott & Willits, 1994; Smith-Sebasto, 1995). Outdoor recreation participation was not limited to a yes/no

dichotomy (activity participation) but rather included the respondents' "most important activity."

Results

Profile of Participants

Collectively, the usable sample from both sampling methods was 522 respondents. Males comprised about 87% of the total sample while 13% were females. The age distribution was skewed towards the ages of 41-50, which represented about 28% of the total sample. However, about 21% represented the 60 and over category. Respondents were extremely homogeneous in terms of ethnicity (99% Caucasian). About 40% indicated that they currently reside in rural areas. Similarly, about 52% reported having a high school education or less, while 35% indicated they have some form of college education (technical/vocational or up to 4 yrs). About 27% reported a combined household income of under \$30,000, while 43% indicated over \$50,000 (see Table 1).

TABLE 1. Profile of Respondents

Characteristics	Frequency	Percentage (%)
Gender (n=522)		
Male	453	87
Female	69	13
Age (n=513)		
Under 30	67	13
31-40	116	22
41-50	142	28
51-60	82	16
60+	106	21
Ethnicity (n=522)		
Caucasian	518	99
Other	4	01
Residence (n=403)		
Farm, ranch, rural area	161	40
Small Town (under 9,999)	168	42
Large town (10,000-49,999)	43	11
Small/Large city/Metropolitan area	31	07
Highest Education Level (n=517)		
High School or less	266	52
4 year College/Technical School	182	35
Graduate School or more	69	13
Annual Household Income (n=468)		
Under \$19,999	40	08
\$20,000 - \$29,999	85	18
\$30,000 - \$49,999	143	31
\$50,000 - \$79,999	130	28
\$80,000+	70	15

Note: The valid percentages have been rounded to equal 100%

Respondents were asked to identify their *most important activity* from all the activities that they had participated in at Bald Eagle State Forest and elsewhere. The activity identified as the most important activity was used as the variable to delineate type of participation in outdoor recreation activity. Hunting, fishing and snowmobiling

were the most popular activities. The activities were recoded in the appreciative-consumptive-motorized activity orientation framework. Appreciative activities accounted for about 34%, while consumptive activities were strongly represented at 51%, and the motorized activity category was the least represented at 15% (see Table 2).

TABLE 2. Activity Orientation and Frequency of Participation of Respondents

Most Important Activity	Frequency	Percentage
Appreciative Activities	168	33.9
Viewing scenery	39	7.9
Walking/day hiking	39	7.9
Camping	28	5.7
Wildlife watching/feeding	16	3.2
Swimming	15	3.0
Picnicking	9	1.8
Mountain biking	8	1.6
Horseback riding	6	1.2
Backpacking	2	0.4
Canoeing	2	0.4
Photography	2	0.4
Jogging/trail running	1	0.2
Hang-gliding	1	0.2
Consumptive Activities	251	50.7
Hunting	173	34.9
Fishing	75	15.2
Insect collection	1	0.2
Target shooting	1	0.2
Cutting firewood	1	0.2
Motorized Activities	76	15.4
Snowmobiling	64	12.9
Off-road vehicles	7	1.4
Motorboating	5	1.0

Environmental Attitudes and Behaviors

The revised 15-item New Ecological Paradigm scale was subjected to a principal components analysis using varimax rotation. However, prior to the factor analysis, 2 of the 15 items were reverse coded to maintain the consistent directionality of the items. Overall, almost 51% of the total

variance was explained. The first factor (Ecocentric) registered 6 items with a Cronbach's alpha reliability of .81, and the second factor (Dualcentric) had 4 items with a reliability score of .58. The third factor (Technocentric) had 5 items and recorded a reliability score of .70 (see Table 3).

TABLE 3. Reliability Analysis for Respondents' Environmental Attitudes

Questionnaire Statements	Mean	SD ^a	Corrected Item Total Correlation	Alpha If Item Deleted
Ecocentric				
The earth is like a spaceship with very limited room & resources	3.44	1.2	.56	.77
If things continue on their present course we will soon experience a major catastrophe	3.25	1.1	.62	.76
We are approaching the limit of the number of people that the earth can support	3.44	1.2	.53	.78
The balance of nature is very delicate and easily upset	3.87	1.0	.58	.77
When humans interfere with nature, it often produces disastrous consequences	3.76	1.2	.48	.79
Humans are severely abusing the environment	3.93	1.1	.61	.76
Overall Index (N=498)	3.62	4.9		.81
Dualcentric				
Humans were meant to rule over the rest of nature*	3.44	1.4	.46	.44
Plants and animals have as much right as humans to exist	3.94	1.2	.46	.44
Humans have the right to modify the natural environment to suit their needs*	3.73	1.2	.33	.55
Despite our special abilities humans are still subject to the laws of nature	4.38	0.8	.26	.59
Overall Index (N=502)	3.87	3.1		.58
Technocentric				
Human ingenuity will insure that we do not make the earth Unlivable	3.08	1.2	.50	.63
Humans will eventually learn enough about how nature works to be able to control it	3.82	1.1	.39	.67
The earth has plenty of natural resources if we just learn how to develop them	2.43	1.2	.44	.66
The balance of nature is strong enough to cope with the impacts of modern industrial nations	3.84	1.1	.47	.64
The so-called ecological crisis facing humankind has been greatly exaggerated	3.22	1.2	.47	.65
Overall Index (N=498)	3.28	3.9		.70

*Items reverse coded

^aStandard Deviation

The 15 proenvironmental behavior items were also subjected to a principal components analysis using varimax rotation. Five factors were identified explaining approximately 70% of the total variance. The first factor (Political Activism) registered 4 items with a Cronbach's alpha reliability of .78; the second factor (Recycling) had 3 items with a reliability score of .84, and the third factor (Educational) had 2 items and recorded a reliability score

of .79. Similarly, the fourth (Green Consumerism) and fifth factors (Community Activism) registered 3 items each with Cronbach's alpha reliability of .73 and .66, respectively (see Table 4). The mean values of the items within each factor for environmental attitudes and behaviors were computed to devise a single index score for each factor.

TABLE 4. Reliability Analysis for Respondents' Environmentally Responsible Behaviors

Questionnaire Statements	Mean	SD ^a	Corrected Item Total Correlation	Alpha If Item Deleted
Political Activism				
Written to your elected officials expressing your opinions on environmental issues	1.67	1.0	.58	.73
Subscribed to environmental publications	1.95	1.1	.60	.71
Voted for a public official due to his/her record on protecting the environment	2.52	1.4	.56	.73
Donated money or paid membership dues to an environmental/conservation organization	2.56	1.4	.60	.71
Overall Index (N=498)	2.18	3.8		.78
Recycling				
Recycled glass bottles or jars or aluminum cans	4.26	1.0	.72	.75
Sorted your trash to separate non-recyclable from recyclable materials	3.87	1.4	.69	.76
Recycled old newspapers	4.00	1.3	.67	.78
Overall Index (N=509)	4.04	3.2		.84
Educational				
Watched TV programs about the environment	3.68	1.1	.65	-
Read books/magazines about the environment	3.30	1.2	.65	-
Overall Index (N=510)	3.49	2.0		.79
Green Consumerism				
Taken into account the amount of packaging on goods you buy	2.68	1.2	.65	.54
Switched products because of environmental reasons	2.62	1.1	.64	.56
Bought products made from recycled materials	3.60	0.9	.43	.79
Overall Index (N=511)	2.97	2.7		.73
Community Activism				
Car pooled or used public transportation to work	1.95	1.4	.39	.67
Attended meetings on environmental/conservation issues	1.80	1.1	.55	.46
Joined in community cleanup efforts	2.31	1.2	.47	.54
Overall Index (N=485)	2.02	2.8		.66

^aStandard Deviation

Bivariate correlations (Pearson's r) between environmental attitudes and environmentally responsible behaviors for appreciative, consumptive and motorized activities were conducted, with significance measured at the .05 level. Upon analysis, the pattern of findings of the correlation coefficients was identified. Those involved with motorized activities showed the highest attitude-behavior contingency for ecocentric, and the lowest for technocentric attitudes. But there were no significant correlations between technocentric attitudes and proenvironmental behaviors for

those involved with motorized activities. Those involved with appreciative activities generally had higher attitude-behavior consistency than those involved with consumptive activities for all three attitudinal indexes (13 out of 15 correlations). Also, those who were involved with appreciative and consumptive activities and harbored technocentric attitudes were least likely to participate in proenvironmental behaviors, as shown by negative attitude-behavior correlations (see Table 5).

TABLE 5. Bivariate Correlations Between Environmental Attitudes and Environmentally Responsible Behaviors for Appreciative, Consumptive and Motorized Activities

Environmental Attitudinal Indexes	Environmentally Responsible Behavioral Indexes				
	Political Activism	Recycling	Educational	Green Consumerism	Community Activism
Ecocentric					
Appreciative	.23**	.15*	.22**	.32**	.18*
Consumptive	.23**	.08	.18**	.23**	.12*
Motorized	.39**	.18	.36**	.53**	.19*
Dualcentric					
Appreciative	.25**	.14	.28**	.27**	.17*
Consumptive	.17**	.03	.24**	.31**	.07
Motorized	.29*	.08	.31**	.38**	.13
Technocentric					
Appreciative	-.36**	-.18*	-.32**	-.27**	-.21**
Consumptive	-.16**	-.03	-.18**	-.18**	-.07
Motorized	.09	.13	-.11	.05	.07

*significant at .05 level (2-tail significance)

**significant at .01 level (2-tail significance)

Discussion

The fact that motorized activities showed the highest attitude-behavior contingency for ecocentric, and the lowest for technocentric attitudes, came as a surprise. In this sample, a sizeable majority of motorized recreationists (86% were snowmobilers) were from rural and small town localities, had a high school or some college education, and also had a lower income when compared with other activity groups. This finding was consistent with the literature (Jackson & Wong, 1982; Knopp & Tyger, 1973). Furthermore, Knopp and Tyger (1973) found that although snowmobilers resonated an 'environmentalist value' theme, it was concluded that based on their level of education, "the snowmobiler may be less aware of the implications of his stated position. He may value the environment, but he may not appreciate what it takes to protect it" (p. 12). Previous research shows level of education does have a relationship with environmental concern and proenvironmental behaviors. Those who are more educated are more likely to support environmental issues (Roper Organization, 1990; Wall, 1995).

Additionally, machine oriented recreationists express more desire for environmental dominance. Such individuals tend to ignore the results caused by their machines; however, these individuals do not hold negative attitudes towards the environment because their drive for dominance supersedes their actions. Consequently their activities take first priority (Bury, Holland & McEwen, 1983). Motorized recreationists (snowmobiles and offroad vehicles) have often been blamed for environmental degradation as well as recreation conflict with competing user groups. Currently, snowmobilers are facing opposition from other competing users in the backcountry, notably heli-skiers, snowcat skiers, backcountry skiers/snowboarders and Nordic skiers (Shelton, 1999). Additionally, they face being permanently banned in federally designated areas such as National Parks (e.g. Yellowstone National Park). Due to such issues, snowmobilers in this sample may be more aware of their

consequences, and hence are more attuned to the environment and uphold favorable attitudes that predispose responsible behavior. Additionally, national and local snowmobiling associations have also stepped up their campaign to promote responsible riding. Conversely, snowmobilers may be responding to questionnaires based on social desirability, in which they respond to questions in a manner that does not depict them in an unfavorable light.

On the comparison between the appreciative and consumptive groups, the results made intuitive sense in that those involved with appreciative activities (which represent a preservationist ideology that includes enjoyment of the natural environment without altering it) generally had higher attitude-behavior correspondence than those involved with consumptive activities for all three attitudinal indexes.

This study introduced several improvements to the literature. Outdoor recreation participation was not limited to a yes/no dichotomy as in most past studies, but rather focused on the respondents' "most important activity." Such an operationalization was a new way of combating the mutually exclusivity issue. Secondly, environmental attitudes (NEP Scale) and environmentally responsible behaviors were analyzed as multidimensional constructs. The multidimensionality of environmental attitudes and behaviors has largely been ignored in the literature. This study combined many activities into an activity orientation rather than examining the activities individually. Future research should account for each activity rather than using the appreciative-consumptive-motorized orientation framework. Analyzing each activity group offers a comprehensive outlook towards that specific activity rather than a generalization of the activity cluster. Also, this study was based on a preliminary analysis and hence was limited to bivariate analysis. For a more detailed and comprehensive account, the reader is referred to Thapa (2000).

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SUPPORT FOR RECREATIONAL TRAIL DEVELOPMENT AND COMMUNITY ATTACHMENT: A CASE OF THE SOUHOOK RIVER WATERSHED

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Abstract: This study was conducted as part of a larger multi-community needs assessment. Data from this study allows for the determination of support for a multiple-use trail system linking communities within the Souhook River Watershed Region in New Hampshire. This study also examines the relationship between support for trail development and community attachment. The results provide evidence that the level and direction of support for trail development depends on the measures that are used to determine such support, highlighting the need for continued research regarding appropriate measures of trail support and community attachment. This study will also provide practical information to land-use and recreation planners that will help them to more effectively communicate with local residents and community leaders regarding trail development.

Introduction

Support for Trail Development

Trails serve as an important connection between people and the land and between conservation and economic development (Flink & Seams, 1993). As more open space and rural land is lost to development, there is an increased interest and need to protect lands for recreational opportunities. Trails are often created in order to enhance or protect a community's natural and cultural resources. The benefits of trails are numerous and have been well documented. Some of the environmental benefits associated with trails include protecting plant and animal habitat, air and water quality, native plant restoration and environmental education and awareness. In terms of economic benefits, trails offer the potential for positive economic impacts by providing many desired amenities (recreation, open space, attractive views) which have been shown to increase the value of property in close proximity to trails (Correll, Lillydahl & Singell, 1978).

While there have been many studies quantifying the benefits of recreational trails, there is a lack of research that seeks to understand the factors that influence support for recreational trail development. Recent studies regarding trails have focused on landowner attitudes and satisfaction with existing trails (Moore, Graefe & Gitelson, 1994;

Parker & Moore, 1998). A notable research implication from the 1998 study suggested further research regarding what factors affect landowner attitudes toward proposed trails, citing that landowners surveyed for the study may have been influenced by attachment to community, among other factors. Understanding support for trail development is crucial in the planning process and to the overall success of trail development. Gaining support and approval from the public—regardless of whether or not every supporter intends to use the trail—is necessary in order to secure funding required for trail development and maintenance. A better understanding of what factors tend to influence support will allow planners to more effectively communicate trail proposals. This study seeks to determine factors that may influence support for trail development using various measures of support and attachment, and whether there is a relationship between trail support and community attachment.

Community Attachment

Attachment to community has been deemed important in terms of the overall wellbeing of a community. Stronger attachment encourages people to be more involved in their communities and to work toward common goals; i.e., safe neighborhoods, good schools, viable town centers (Fischer, et al., 1977). Attachment to community is best viewed as a complex construct that refers to an individual's commitment to one's place of residence. It can be in the form of social ties and subjective feelings toward place of residence, which is often referred to as "sense of community" (Liu, Ryan, Aurbach & Besser, 1998). Attachment can occur in different ways and depends on a variety of factors including personal needs, opportunities and resources, and on the characteristics of people and places.

Community attachment has been used as a measure of support on various issues, although the results of such research have proved inconsistent. Some research suggests that stronger community attachment leads to stronger support for a variety of community improvement initiatives. In terms of economic activity, people with stronger community attachment tend to purchase goods and services locally (Cowell and Green, 1994). Other research suggests that, with specific types of recreation and tourism development, the stronger the community attachment, the more likely they are to oppose change. This study allows us to empirically examine whether people with stronger attachment to their communities tend to be more supportive of trails.

Study Objectives

There are three main objectives of this study. The first objective is to measure support for trail development using a scale variable and a direct question of support. Second, this study will measure community attachment of residents who live within the communities surrounding the proposed trail using eight common measures and four alternative measures of attachment. And, third, the study examines the relationship between the various common and alternative

measures of attachment and support and whether the direction of these relationships is consistent.

Methods

The Research Setting

The Soucook River Watershed is located in the Upper Merrimac River Basin in New Hampshire. The area has a rural character with urban development present but confined to the immediate area surrounding the major roadway, Route 106. The Watershed includes approximately 97 square miles in eight communities. Town populations range from 1,771 in Canterbury to 37,850 in Concord. Total population of all the communities that include at least one square mile of the watershed is about 48,845. The towns in the watershed employ between 12 and 15 percent of the total population within each community, with the exception of Concord, which employs 68 percent of its residents.

Data Collection

The research instrument was a mail questionnaire sent to a sample of New Hampshire residents in the Greater Soucook Watershed Region during the summer of 1998. The sample was purchased from Survey Sampling, Inc., of Fairfield, CT. The survey was distributed to a stratified random sample of households within each of the communities that had over one square mile of land within the watershed. The number of households from each community included in the sample was determined by the proportion of square miles of land in the watershed and the total population of the town. A conservative formula was used to establish the number of completed surveys needed to allow for representation of watershed communities. It was calculated that 372 completed questionnaires were required to achieve a 95 percent confidence level.

Response Rates

The questionnaire was distributed to 1,700 households within the watershed. Problems associated with the mailing list and sample selection resulted in 214 questionnaires being returned as undeliverable, resulting in a revised sample size of 1,486. The utilization of a modified version of Dillman's (1985) Total Design Method (i.e., postage paid return envelope, postcard reminder, replacement questionnaire with letter, and second postcard reminder) resulted in the completion of 536 mail questionnaires for a total response rate of 36 percent.

Measurement

Support for Trail Development

Support for trail development can be measured in different ways, including monetary, social, time, and quality of life dimensions. The first measure of support consisted of a direct question about whether or not the respondent would support a multiple-use trail system. Another measure of trail support was accomplished with a series of eight statements that focused on various aspects of and potential benefits from trail development (See Table 1). The respondents were asked to respond to the eight statements

designed to measure support on a five-point scale from strongly disagree to strongly agree.

Community Attachment

There are various measures of community attachment. Historically, community attachment has been measured in terms of social bonds and local sentiment (Kasarda & Janowitz, 1974). Statements designed to measure community attachment include whether someone "feels at home" in their community, and whether one would "be sorry to leave" their community (Kasarda & Janowitz, 1974). The extent of social and kinship networks within the community has been shown to have a significant influence on community attachment, and that length of residence is a key factor in the development of these social bonds (Kasarda & Janowitz, 1974). Apart from casual interactions, social bonds arise out of employment, consumption and recreation (Fischer, et al., 1977). Having school-aged children has been shown to encourage the introduction and maintenance of relationships within the community, so that people with children tend to be more strongly attached to their community (Fischer, et al., 1977).

This study uses a cross-section of different measures, including measures of peer networks, having school-aged children and leadership positions. The watershed residents were provided eight specific statements that have been shown to measure the extent to which individuals are attached to their community (See Table 2). Another section of the questionnaire had a general question dealing with attachment using a strongly disagree to strongly agree scale.

One-way analysis of variance was used to assess the relationship between trail support and community attachment. The various statements of support listed in Table 1 were combined to create an index variable with an alpha coefficient of .92.

Findings

Measures of Trail Support

Using a direct question to measure support, given the statement "I support building a multiple use trail system near the Soucook River", 74 percent of the sample supported trail development by responding "yes". Only 8 percent of the sample indicated that they would not support development of the trail, and nearly 18 percent were unsure if they would support or oppose trail development. This would suggest that an overwhelming majority of residents within the watershed support trail development.

Table 1 illustrates the responses to a series of eight statements designed to measure trail support. The responses were measured on a five-point Likert scale, ranging from strongly disagree to strongly agree. The mean scores on the right-hand side of the table represent the overall mean score for all responses combined for each statement, weighted 1 through 5. The highest mean scores correspond with the statements that a trail system "would improve the quality of life for residents" (mean = 3.77) and that building a trail is a "good use of money" (mean =

3.75). These results suggest that respondents make the connection between trail development and improved quality of life. The lowest mean scores correspond with statements regarding funding through support of a bond issue for trail development (mean = 3.15) and a donation of time for trail maintenance (mean = 2.92). These results indicate that while there is a majority of support for trail development, residents are unsure about how to pay for trail development and maintenance.

Measures of Community Attachment

Table 2 provides a summary of percentages for responses to statements that were selected on the basis of the literature review as common measures of community attachment. Eighty-five percent of the sample indicated that they "definitely feel at home in the community", and 69 percent said they "would be very sorry to have to move away from the community". Nine percent indicated that they had "held an elected position in the community" and 15 percent indicated that they had "held an appointed position".

Regarding the general question of attachment, residents were asked to respond on a five-point scale to the community attachment statement of "I feel very attached to my local community". This attachment statement elicited a 15 percent response to strongly agree, 43 percent agreed, and 30 percent neither agreed nor disagreed with the statement. The results would suggest that residents of the watershed are somewhat attached to their local communities.

Trail Support and Community Attachment

This section provides the results for a series of one-way analyses of variance that seek to determine the relationship between trail support and community attachment using the various measures of support and attachment. Table 3 illustrates the relationship between the eight statements that make up the specific measures of community attachment and an index variable of support for trail development. The columns represent the results for two groups, those who responded no and those who responded yes to the listed attachment statements. The mean scores reflect a value associated with the index variable of support, weighted 1 through 5 from strongly disagree to strongly agree. The overall F test revealed the significant factors to be whether the respondent had held an elected position in the community ($sig. = .001$) or had held an appointed position

($sig. = .006$). These findings suggest that persons who had held such leadership positions within the community were less supportive of trail development than those who had not held such a position within the community. Also notable was whether or not the respondent had school-aged children, revealing that respondents with children of school age were more likely to support trail development ($sig. = .071$).

When measuring support using the same direct measure of support, "I support building a multiple-use trail system near the Soucook River", and the general measure of attachment to community ($sig. = .019$), this measure proved significant. Responses to the attachment statements corresponded to a five-point scale ranging from strongly disagree to strongly agree. Regarding attachment to the local community, those who support trail development had a mean score of 3.6 while those who did not support development had a mean score of 3.3. This suggests that those who feel more strongly attached to their community are more likely to support trail development.

Discussion

This study reveals that, overall, there is considerable support for trail development. When measured in terms of community attachment, the level and direction of support depends on how attachment is measured. Determining support using specific measures of attachment indicated that persons who had held an elected or appointed position in the community were less likely to support trail development. Financial considerations may be an important factor among local officials in determining support for recreational trails. Local officials may think of recreational trails as a financial burden on their community (development and maintenance costs) rather than a desired amenity that has the potential to create positive economic impacts for the community. In efforts to establish support, trail planners may want to present their local officials with economic impact studies that highlight the benefits of trails on communities. This study also revealed that those persons who have school-aged children tended to have stronger levels of community attachment and were also more likely to support trail development. Knowing this will help planners to establish an initial support base among this group as they work toward garnering a broader base of support from the overall community.

Table 1

Frequency counts, (percentages), and central tendency statistics for responses to statement of trail support

Statement*	Statistics for responses to statement of trail support					Mean	Standard Deviation
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
I think building a multiple-use trail system within the SRWR is a good use of money. (n=502)	33 (7)	24 (5)	108 (22)	206 (41)	131 (26)	3.75	1.1
I think a trail system would facilitate collaboration between the communities within the SRWR. (n=501)	28 (6)	40 (8)	138 (28)	213 (42)	82 (16)	3.56	1.0
I would make a small donation for the maintenance and upkeep of a trail system. (n=497)	50 (10)	57 (11)	135 (27)	193 (39)	62 (12)	3.32	1.1
I would support a multi-community bond issue to develop a trail system. (n=495)	69 (14)	61 (12)	144 (29)	167 (34)	54 (11)	3.15	1.2
Trail maintenance expenses should be shared by each of the communities in the SRWR. (n=494)	39 (8)	23 (5)	73 (15)	248 (50)	111 (22)	3.75	1.1
I would donate my time to the operation and maintenance of a trail system. (n=490)	78 (16)	73 (15)	173 (35)	141 (29)	25 (5)	2.92	1.1
A trail system in the SRWR would improve the quality of life for residents. (n=496)	32 (6)	22 (4)	107 (22)	205 (41)	130 (26)	3.77	1.1
Building a biking or walking trail should be a priority for my community. (n=506)	21 (4)	55 (11)	171 (34)	160 (32)	99 (20)	3.5	1.0

*Responses weighed 1 through 5 from strongly disagree to strongly agree

Table 2. Summary of Percentages for Responses to Statements of Community Attachment

Statement	n	Answered No Percent	Answered Yes Percent
• I definitely feel at home in the community.	520	15	85
• I would be very sorry to have to move away from the community.	521	31	69
• I have school-aged children who live in the community.	525	62	38
• Most or all of my close personal adult friends live in the community.	523	79	21
• I know most or all of the adults in the community.	520	84	16
• I have held an appointed position in the community.	418	85	15
• Most or all of my relatives live in the community.	524	89	11
• I have held an elected position in the community.	525	91	9

Table 3
ANOVA Results for the Relationship Between Measures of Community Attachment and a Scale Variable of Support

Statement	Answered No		Answered Yes		F Value
	n	Percent	Mean	Standard Error	
• I definitely feel at home in the community.	520	15	3.55	.118	.196
• I would be very sorry to have to move away from the community.	521	31	3.54	.08	.943
• I have school-aged children who live in the community.	525	62	3.53	.056	.064
• Most or all of my close personal adult friends live in the community.	523	79	3.61	.047	.101
• I know most or all of the adults in the community.	520	84	3.61	.045	.123
• I have held an appointed position in the community.	418	85	3.64	.05	.152
• Most or all of my relatives live in the community.	524	89	3.61	.044	.145
• I have held an elected position in the community.	525	91	3.64	.043	.182

* Significant at the .05 level ** Significant at the .001 level

Mean scores reflect value on an index variable of trail support, weighted 1 through 5 from strongly disagree to strongly agree.

Implications

This study has important implications for recreation planners and trail advocates. The results indicate that there is considerable support for trail development, which follows the current trend of the increasing need and demand for recreational opportunities. This study provides a better understanding of support for trail development that will help planners and trail advocates more effectively communicate trail proposals as a way to help encourage public participation in the planning process. Such public participation will allow for further exploration into what may be influencing opposition to trail development, providing an opportunity to address the needs and concerns of community residents to better ensure that trail development reflects the needs of the community.

Also, trail designers and developers should consider the importance of trails as conduits for social interaction. In our current shift to a more "global" society, there is a new focus on the "local" society and the importance of attachment to place. Earlier research has suggested creating opportunities for residents to meet as a way to strengthen attachment (Liu, Ryan, Aurbach & Besser, 1998). Recreational trails would be one way to increase opportunities for social interaction while reinforcing existing social networks.

This study shows that while there is considerable support for trail development, that level of support depends on how we measure community attachment. How we choose to measure attachment makes a difference in the strength and direction of support for trail development. Further analysis should be conducted to investigate the relationship between support for trail development and community attachment.

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HUMAN TERRITORIALITY: AN EXAMINATION OF A CONSTRUCT

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Abstract: Human territory research has generally been focused in a variety of settings including urban neighborhoods, libraries, mall parking lots, and areas around phones in public places. It refers to an intertwined system of emotions, beliefs, and behaviors that are place specific, socially and culturally influenced, and are linked to person-place transactions dealing with issues of setting management, maintenance, and expressiveness. A better understanding of human territoriality and its application in outdoor recreation settings has the potential to contribute to a more comprehensive understanding of recreation experience and conflict. Thus, the purpose of this study is to explore the nature of human territoriality and develop the construct in the context of outdoor recreation. Territoriality has been studied primarily in urban settings. In that context, territorial behaviors attempt to control not only the activities of others, but their access to a particular area. Territorial beliefs include an individual's perceptions or belief that they can control who enters a site, what goes on at the site, who should take care of a site, or the types of activities that are allowed to take place. Territorial emotions include: a positive emotional bond to a place and the condition of that site as well as the type of user that should be there, and negative emotional reactions to possible changes in conditions and users in an area. Because many of the studies on human territoriality have been in neighborhoods or other public areas like libraries or dormitories, traditional measures of territoriality have been modified in order to interpret its meaning in a natural resource environment. To test this construct in the context of outdoor recreation, we will be using data from an angler study conducted in New England. In order to determine if the construct holds together as predicted, we have used descriptive statistics for all items in the construct, inter-item correlations matrices for the scales in this study, item-total correlations testing each item against totals of each dimension, and reliability analysis using Cronbach's alpha. We have used the results of the item analysis as well as factor analysis to assess the dimensions of the construct and compare results to the conceptual structure of territoriality as developed in past research. Lastly, we have examined the territoriality construct to determine if it differs from a conceptually similar construct, place attachment, in order to test for discriminant validity.

Introduction

Human territoriality is defined as the impetus of humans to establish permanent or temporary control over physical spaces (Malmberg, 1980). Human territoriality refers to an intertwined system of emotions, beliefs, and behaviors that are very place specific, socially and culturally influenced, and are linked to person-place transactions dealing with issues of setting management, maintenance, and expressiveness (Taylor, 1988). "Territoriality" is also seen as a way of examining human behavior rather than describing an actual type of behavior (Schefflen & Ashcraft, 1976). Human territoriality research has generally been conducted within the following settings: urban neighborhoods, libraries, mall parking lots and areas around phones in public places.

Human territoriality may be associated with a variety of situations in the natural environment, including conflict. Because recreation sites are often symbolic and have deep personal meaning for people, territorial models, like crowding and conflict models, stress an individual's perceived control as an important part of a satisfying experience (Zinn, 1992). Territorial functioning may cause conflict between users and managers as well as between different or similar recreational user groups. A better understanding of human territoriality and its application in outdoor recreation settings has the potential to contribute to a more comprehensive understanding of resource conflict and provide better information to deal with and manage situations as they arise (Zinn, 1992). With this knowledge and understanding, it may be possible for managers to provide a more satisfying experience.

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. Specific territorial behaviors in previous research might include painting, planting shrubbery, fixing up a home, and keeping a well-maintained lawn (Taylor, 1988). An individual taking part in such activities is considered to be "marking" an area that holds a certain value to the person. Territorial beliefs include an individual's perceptions or belief of who should enter a site, what goes on at the site, who should take care of a site or the types of activities that are allowed to take place at a 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 person that should use the area, and negative emotional reactions to possible changes in conditions and users in that very same area.

In this study, human territoriality has been conceptualized as a person's attitude towards a specific place. For instance, a person will develop an attitude towards their home or perhaps (in the context of this study) a special lake where they grew up fishing with their grandfather. Researchers suggest human territoriality will exhibit a tripartite structural characteristic, consistent with many definitions of attitudes (Eagly & Chaiken, 1993; Thompson, Zanna, & Griffin, 1995). In other words, it will

be made up of cognitive (beliefs), affective (emotions), and behavioral (or behavioral tendencies) components. Another expectation from this line of research is human territoriality will function like an attitude in that a territorial response is an overall or summary evaluation of an important place. Basically, a territorial response organizes one's beliefs, emotions, and behavioral tendencies into a coherent appraisal of a special place (Eagly & Chaiken, 1993; Greenwald, 1989). This in turn includes what might be considered beliefs towards what should and should not occur in a valued place.

The purpose of this study was to explore the human territoriality construct in the context of outdoor recreation. It is postulated that territoriality may contribute to a more comprehensive understanding of recreation resource issues such as conflict, crowding and satisfaction.

Methodology

The data for this study were obtained from a study focusing on anglers in the New England District of the U.S. Army Corps of Engineers. Anglers were specifically asked about the lakes they fish most frequently and the last lake they fished. The New England District of the U.S. Army Corps of Engineers indicated an interest in measuring the levels of importance and satisfaction concerning customer service-related issues. Their interest was driven by the desire to meet the mandate set forth by Executive Order 12962 "the Recreational Fisheries Executive Order." The executive order requires federal agencies "to the extent permitted by law and where practicable, and in cooperation with States and Tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities." With this in

mind, the overall study's intended purpose was to explore the nature of service quality indicators as predictors of customer satisfaction for anglers in the New England District.

Data Collection Procedures

A multiple-method approach was used for data collection to obtain a diverse sample of anglers from the New England region. The project offices of the Corps of Engineers provided the names of groups and club representatives for Penn State researchers to contact by phone. A total of eight groups agreed to participate in a mail-out survey. Individual anglers that have participated in youth angling days (day to teach young children about fishing) and volunteered to clean up the shoreline also had their names and addresses provided to Penn State researchers. A modified Dillman multiple-mailing process was used to sample possible survey respondents. Two state bass federation organizations were also contacted and agreed to distribute surveys to club members to complete and return to Penn State University. The total sample size for this study was 176.

Measurement

For the territoriality construct, traditional measures had to be modified for use in natural resource settings. A total of 12 items were tested to measure territoriality (Table 1). The items used in this study were developed to measure recreationists' emotions, beliefs, and behaviors towards a specific place. The items use a five-point scale with responses ranging from "strongly disagree" to "strongly agree."

Table 1. Items Used to Measure Human Territoriality

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Belief					
Everyone should be able to use this place	1	2	3	4	5
People should be free to do whatever they want at this place	1	2	3	4	5
People who have used this place longest should have priority using it	1	2	3	4	5
Managers need to restrict use at this place	1	2	3	4	5
Emotion					
I have a lot of fond memories about this place	1	2	3	4	5
This place means more to me than any other place I can think of	1	2	3	4	5
I have a special connection to this place and the people that use it	1	2	3	4	5
For me, lots of other places could substitute for this one	1	2	3	4	5
Behavior					
I know this place better than the people who run it	1	2	3	4	5
I treat this place better than most other people that come here	1	2	3	4	5
I will (or do) bring my children to this place	1	2	3	4	5
I don't tell many people about this place	1	2	3	4	5

Analysis

Factor analysis and Cronbach's coefficient alpha were used to test the internal dimensions of the territoriality construct in an outdoor recreation setting. The territoriality construct

was tested as a possible predictor variable of satisfaction. Lastly, the relationship between territoriality and place attachment, two similar constructs, was examined by conducting a factor analysis on items from both constructs.

All analyses were measured for significance at the .05 level.

Results

An initial factor analysis of the 12 items in the construct identified three factors that corresponded to the hypothesized dimensions of territoriality and two items that loaded separately (Table 2). The three dimensions that factor analysis identified included territorial beliefs, emotions and behaviors. The first dimension, territorial emotions, retained all four items originally hypothesized to represent the dimension (Eigenvalue=2.67; Variance=22.26; Reliability=.69). The second dimension

representing territorial behaviors retained three of the four items predicted to represent this dimension (Eigenvalue=1.93; Variance=16.07; Reliability=.52). Lastly, the third factor determined through principle component analysis was 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). The third item in factor 3 loaded high on both factors 3 and 4. Because this item is conceptually hypothesized to be in the territorial behaviors dimension and the score on factor 4 was only slightly stronger, it was believed that the item should remain in its conceptualized dimension.

Table 2. Factor Analysis (Human Territoriality, N=176)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1 'Territorial Emotions'					
This place means more to me than any other place I can think of	.737	.145	-.028	-.260	.002
I have a special connection to this place and the people that use it	.723	.237	-.098	-.006	-.002
For me, lots of other places could substitute for this one ¹	.687	-.353	.289	.151	.295
I have a lot of fond memories about this place	.668	.258	-.195	.347	-.001
Factor 2 'Territorial Beliefs'					
I know this place better than the people who run it	.333	.674	-.132	-.009	.146
I treat this place better than most other people that come here	.236	.671	.193	.181	-.124
I don't tell many people about this place	-.137	.605	.178	-.295	.289
Factor 3 'Territorial Behaviors'					
Everyone should be able to use this place ¹	-.155	-.015	.873	-.002	-.005
Managers need to restrict use at this place	.141	.471	.579	.102	-.135
People who have used this place longest should have priority using it	-.029	.159	.501	-.508	.207
People should be free to do whatever they want at this place* ¹	-.083	.024	.120	.770	.232
I will (or do) bring my children to this place*	.076	.078	-.089	.119	.863
Eigenvalue	2.671	1.929	1.227	1.145	1.013
Percentage of Total Variance	22.262	16.073	10.226	9.539	8.444
Reliability (Cronbach alpha)	.689	.518	.545	-----	-----

Factor 1 Scale Mean = 3.32

Factor 2 Scale Mean = 3.09

Factor 3 Scale Mean = 2.51

*Item in original construct not used in further analysis because of low Reliability Analysis and did not load on the final three factors in bold.

¹Item reverse coded prior to analysis.

While the reliability scores for the three dimensions revealed through factor analysis were moderate to low, principle component analysis with varimax rotation found the three factors initially conceptualized in the initial model to factor together. Because territoriality is exploratory in this study, its use may provide insight into how peoples' relationships with places impact customer satisfaction and other important issues in outdoor recreation. Therefore, it is believed that testing the construct is warranted. All of these dimensions represent the pool of human territorial dimensions previously predicted to represent human territoriality.

Two items failed to load on the three hypothesized factors. These items were "People should be free to do whatever

they want at this place" and "I will (or do) bring my children to this place." Because each of these items loaded alone on a single-item factor, unrelated to the hypothesized dimensions, they were not tested as predictors of satisfaction.

Because it is theorized that territoriality research may offer a new perspective on old problems in outdoor recreation research, the next step in the analysis was to test the ability of the territoriality dimensions to predict overall satisfaction with the fishing experience (Table 3). The three dimensions (emotions, beliefs, behaviors) were tested for their relationship with overall satisfaction with the fishing experience using multiple regression analysis. The strongest predictor of overall satisfaction with the fishing

experience was territorial emotions ($B = .385$; $p < .001$) followed by territorial beliefs ($B = -.148$; $p < .05$). For the

third dimension of territoriality, territorial behaviors, the relationship was not significant.

Table 3. Results of Multiple Regression of Human Territory Dimensions on Overall Satisfaction with Fishing Experience.

Independent Variable	Overall Satisfaction	
	<i>r</i>	<i>Beta</i>
Territorial Belief	-.181*	-.148*
Territorial Emotion	.354**	.385***
Territorial Behavior	-.039	-.104
<i>R² Territorial Dimensions Belief, Emotion, and Behavior</i>		.167***

*** Significant at .001

** Significant at .01

* Significant at .05

The final step in the analysis included an examination of the relationship between territoriality and place attachment. This was accomplished by testing all items within the place attachment (8 items) and territoriality constructs (12 items) using factor analysis (Table 4). Factor analysis revealed that the four territorial emotion items and the eight place attachment items loaded together on the first factor (Eigenvalue = 6.15; Variance = 30.76; Reliability = .90), evidence that territorial emotions and place attachment may be related psychological constructs. Three territorial belief items (Eigenvalue = 1.65; Variance = 8.27; Reliability = .55) and three territorial behavior items (Eigenvalue = 2.07; Variance = 10.37; Reliability = .55) factored separately from the first factor and each other. Factors 4 and 5 both were comprised of single items, the same items that failed to load as expected when tested with only human territoriality items. This test of discriminant validity suggests that human territoriality and place attachment may overlap at the affective level, but provides evidence that territorial beliefs and behaviors are distinct from place attachment.

Conclusions and Implications

The results of the study suggest that further investigation of the human territoriality construct is warranted. Analysis supported the hypothesized three-dimensional structure of human territoriality (emotions, beliefs, and behavior). This result is consistent with past research conducted in urban settings by environmental psychologists (Taylor, 1988). However, the moderate to low reliability scores for the three territorial dimensions indicate that the three dimensions will have to be reexamined and additional items

developed and tested to improve the reliability of the dimensions in the context of outdoor recreation.

The prediction of overall satisfaction with the fishing experience by territorial emotions and beliefs suggests that increasing our understanding human territorial responses in the context of outdoor recreation may improve our understanding of the outcomes of recreation experiences. As the territorial construct is refined in the future, it should be tested further as a predictor of overall satisfaction, as well as other dependant variables, such as crowding, conflict and willingness to pay.

The relationship between human territoriality and place attachment will require additional investigation. Both territorial beliefs and territorial behaviors factored separately in this analysis, indicating that there is some discriminant validity between the variables place attachment and territoriality. In contrast, territorial emotion items factored with place attachment items, suggesting they are closely related. This result, perhaps, indicates that overlap between the two constructs occurs primarily at the affective level. Additional research will be needed to refine the human territorial emotions dimension and test its relationship to place attachment.

Overall, the results of this exploratory study support additional research into the role of territoriality in outdoor recreation. The territoriality construct has the potential to help managers and researchers advance our understanding of recreationists and their outdoor experiences. Future investigations of territoriality should include the analysis of both qualitative data and quantitative data, as well as data from other settings.

Table 4. Factor Analysis for Human Territoriality (HT) and Place Attachment (PA)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
I get more satisfaction out of visiting this lake than from visiting any other lake (PA)	.844	.008	.004	-.009	.001
Fishing here is more important than fishing in any other place (PA)	.821	.005	.001	-.118	-.102
I enjoy fishing here more than any other lake (PA)	.790	.005	.006	-.001	.003
I am very attached to this lake (PA)	.755	.259	.001	.110	.154
This place means more to me than any other place I can think of (PA)	.709	.271	-.007	-.194	-.005
I wouldn't substitute any other lake for the type fishing I can do here (PA)	.691	-.002	.003	-.101	-.007
I identify strongly with this lake (PA)	.655	.328	.002	.182	.186
For me, lots of other places could substitute for this one (HT)	.630	-.148	.009	.372	.140
This lake means a lot to me (PA)	.579	.253	-.154	.222	.308
I have a special connection to this place and the people that use it (HT)	.529	.429	-.205	.001	-.003
I feel no commitment to this lake (PA)	.504	.009	-.008	.478	.130
I know this place better than the people that run it	.146	.711	-.008	-.009	.202
I treat this place better than the most other people that come here (HT)	.115	.706	.162	.006	-.009
I have a lot of fond memories about this place (HT)	.347	.493	-.364	.359	.001
I don't tell many people about this place (HT)	-.007	.434	.348	-.316	.357
Everyone should be able to use this place (HT)	-.001	-.005	.870	.157	-.141
People who have used this place longest should have priority using it (HT)	.007	.007	.608	-.362	.201
Managers need to restrict use at this place (HT)	.008	.520	.531	.008	-.129
People should be free to do whatever they want at this place (HT)*	-.176	.004	.003	.767	.008
I do (or would bring my children to this place)*	.007	.001	-.004	.124	.848
Eigenvalue	6.151	2.073	1.654	1.342	1.033
Percentage of Total Variance	30.755	10.366	8.272	6.711	5.164
Reliability (Cronbach alpha)	.898	.545	.545	-----	-----

Factor 1 Scale Mean = 3.39

Factor 2 Scale Mean = 3.33

Factor 3 Scale Mean = 2.51

*Item in original construct not used in further analysis because of low Reliability Analysis and did not load on the final three factors shown.

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WHAT'S HAPPENING IN OUR PARKS?

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Abstract: Facilities allow children and adults to adapt, improvise, create, and contribute significantly to the mental and physical well-being of the park users. Parks across the continent contain facilities designed for the enjoyment of the consumer. However, are facilities really used as designed and used to the intended level making them worth the cost of development? An observational study was performed on various urban, suburban, and rural park settings to examine the usage of facilities provided.

Facilities allow children and adults to adapt, improvise, and create, contribute significantly to the mental and physical well-being of the park users. What is the prevailing attitude if, as an example, a tennis court was used for dancing or crafts, the baseball field for bocce ball or soccer, and the playground for adult socialization? Can tennis nets be easily removed, is there a place where bocce ball can be played, are their benches in or adjacent to playgrounds that foster conversation among parents? Do park administrators condone or encourage non-traditional use of facilities?

During the summer months extensive research was conducted in Indianapolis and Bloomington Indiana area as well as in Angling Lake Ontario, a remote Native American village in the northern part of the Province. The purpose was to observe how parks were used, specifically, if the park facilities were used in a manner consistent with the purposes they were designed. Parks across the continent contain facilities designed for the enjoyment of the consumer. These facilities can include costly accommodations such as ball fields, tennis courts, basketball courts, and pools to relatively costly facilities such as picnic shelters and playgrounds. In addition, parks often contain picnic tables and benches in the open areas for purposes of relaxation. Most recreation planners and designers believe that increasing the amount of facilities will increase the enjoyment of the consumer. Are specially designed facilities, specifically aimed at a single activity, really worth the money spent to provide that leisure experience? In other words, are facilities really used as designed and used to the intended level making them worth the cost of development?

The observation areas were classified into three categories for sake of comparison. Angling Lake represents a rural park experience, Bryan Park (Bloomington), Ellenberger (Indianapolis) and Broad Ripple (Indianapolis) represent suburban Parks and three Indianapolis parks (Brookside, Christian and Riverside) represent Urban Parks. The distinction of suburban and urban was based on the number of residents in the Zip Code area of the park. Those less than 40,000 were classified as suburban and those more than

40,000 were classified as urban. In addition the urban parks represent those parks which are closer in proximity to the city center of a major metropolitan area. These parks were chosen for comparisons because they were similar in size (medium sized City Park) and contained similar facilities. Facilities, observed in the various parks, included playgrounds, picnic tables in the open areas, picnic shelters, sports fields, tennis courts, pools, jogging trails, and basketball courts.

A playground area that includes swings and other play apparatus is designed to be used for child play and exercise and thus, enhances a child's physical and mental health. Parents usually accompany their younger children to playgrounds to insure their safety. In this observation, playgrounds (with equipment such as swings and slides) were used as designed by the children under the age of seven who made up sixty-three percent (63%) of the users¹. Parents and/or guardians also used the playground area for socialization as their children were playing on the equipment. Adults generally would spend a moment socializing with friends or reading a book as their child played on the equipment provided. The social contact among adults may be as important to parents as the physical activity and play is to the child.

Data Application: the substantial number of supervising adults, particularly, in the urban and suburban parks and denotes a need by park officials to provide seating areas in the playground areas for the adults to use.

All surveyed suburban and urban parks had picnic tables that were designed for outdoor picnics (eating.) Seventy-one percent (71%) of the people in the urban areas used the picnic tables for meals while only fifty-six (56%) of the suburban table users were picnicking². The non-picnic use of the tables (defined as not involving food) included relaxation, work breaks, socializing, reading, and working outdoors. The "working outdoors" category comprised of activities such as student homework, knitting, board games and other activities where people are seeking an outdoor setting to some work that would normally be done at home.

Data Application: In the suburban area many of the picnic tables in the open could be replaced with less costly benches and provide the same usage. Picnic shelters were in high demand, especially in the urban parks, on the weekends. In addition, picnic shelters were highly used in the weekday evenings in the urban parks. The increase in demand for picnic shelters in the urban areas could be the result of

¹ There was no significant difference between people using the playground as designed and people using the playground as non-designed [χ^2 -square = $\chi^2(2, N=3)=1.56, p < .05$]

² There was a significant difference between urban and suburban usage of the picnic tables in the open space [χ^2 -square = $\chi^2(1, N=2)=10.7, p < .05$] and in picnic shelters [χ^2 -square = $\chi^2(1, N=2)=4.39, p < .05$].

cultural differences between the urban and suburban communities and should be a need that is addressed by park officials, particularly in the urban settings.

Parks included a number of baseball/softball fields. Seventy-two percent (72%) of those using the ball fields in suburban parks were playing softball or baseball while only forty-nine percent (49%) of those in the urban parks were using the field for baseball or softball³. There were a large number of people attending the ball games in the urban parks as observers and non-players. Males were dominant as players and females were dominant as spectators. There was no usage of the baseball/softball field in the rural community during the two-week period of observation.

Data Application: The observers created a substantial need for seating at the facilities, but very few of the parks had accommodations for spectators. Many spectators improvised by bringing their own lawn chairs or blankets to sit on.

Suburban and Urban parks contained a number of tennis courts. In the urban parks seventy-two percent (72%) of those near the tennis courts were playing tennis compared to ninety-seven percent (97%) in the suburban parks (the rural park had no tennis courts)⁴. The difference in usage was largely due to the urban park tennis courts being used for tournaments during a couple of the observations. The tournament situation increased the number of observers. Approximately seventy-seven percent (77%) of tennis courts users were male. There was very little non-tennis play in the tennis courts with only one observation noting a couple children playing with a ball. In the forty-eight observations there were 196 people playing tennis compared to 794 using playgrounds and 1770 using ball fields.

Data Application: The question arises whether the cost of putting in tennis courts is cost-effective. During a number of observations the tennis courts remained empty and did not appear to be economically viable.

On the other hand, swimming appeared to be a popular activity. While some of the parks included pools, the rural community used a lake for they're swimming enjoyment. Seventy percent (70%) of the pool users in the suburban and rural settings used the pool for swimming while eighty-five percent (85%) of the urban pool users were swimming⁵. The

³ There was shown to be a significant difference in the usage of ball fields between the urban and suburban areas [$\chi^2(1, N=2)=36.06, p < .05$].

⁴ There was a significant difference in tennis court usage between urban and suburban parks [$\chi^2(1, N=2)=13.4, p < .05$].

⁵ There was a significant difference between the urban parks and the suburban parks [$\chi^2(1, N=2)=54.7, p < .05$], between the urban parks and Angling Lake [$\chi^2(1, N=2)=11.09, p < .05$], but not between the suburban parks and Angling lake [χ^2

remainder of the people used the pool area for socializing, relaxing, and sunbathing and in the case of the rural community for fishing and playing. The increase in non-swimmers in the suburban area could be explained partially due to the ethnic make up of the communities (for example: sunbathing being primarily an Euro-American activity). The suburban parks were eighty-three percent (83%) Euro-American and the urban parks were seventy-seven percent (77%) African American. In the twenty-five observations at suburban parks there were 640 people using the pool area for activities other than swimming.

Data Application: the areas open to those wishing to socialize, relax, or sunbathe was inadequate at the suburban parks. The number of people using the pool area for non-swimming leisure demonstrates a considerable need for space for those wishing to relax and enjoy the pool area.

Walking and Jogging is becoming a highly desired activity in our communities. Suburban parks noted 5.12 walkers and joggers using the trails provided per observation. In the urban park there were 1.52 walkers and joggers per observation. Further study would be needed to understand the reason for the increase in popularity among suburban parks over urban parks. The reason could be a perceived sense of safety as well as cultural with half of the walkers in the urban parks being Euro-American in parks predominately used by African Americans. In the suburban parks ninety-two percent (92%) of walkers and joggers were Euro-American. In urban parks the activity seems to be more of a family social activity with fifty-seven percent (57%) being adults and the remainder being predominately children with their parents. In contrast, walking and jogging in the suburban park seemed to be an individual fitness or peer related activity with seventy-four percent (74%) of suburban users being more than twenty-one.

Data Application: Trail use is an attractive and favorite pastimes for those using the parks, especially in the suburban setting where there may be a greater sense of safety. Parks should monitor usage of the trails to determine if trails need to be expanded. There was not enough usage of trails by bicycles to warrant development of bike trails in the parks observed.

Basketball is an activity common in all parks observed. Those not using the basketball area for basketball were observers and others waiting for a chance to participate. In the suburban and urban parks ninety-three percent (93%) of users were male with only difference being ethnic background of users. The largest age group represented in the suburban parks were those between the ages of fifteen and twenty-one (79%) probably due to the number of Indiana University students who use Bryant Park. The same age group in the urban parks represented forty-five (45%) percent of users with the more than twenty-one age group representing 35 percent of users. **Data Application:** In the urban and suburban parks the courts were actively used and seem to be a positive usage of

($1, N=2$)=.412, $p < .05$] in the use of the swimming area.

recreation funds. In the Native American community there was no usage of the basketball court for basketball largely due to the activity of choice in this community being volleyball (court serves a dual purpose).

The urban parks were the only parks observed containing soccer fields. This was an interesting finding with the popularity of soccer today. However, soccer fields are located outside the observed parks in the suburban communities. In the urban parks only four percent (4%) of those using the soccer fields used them for soccer. The soccer fields at Riverside were predominately used for playing and observing rugby (92%), which was interesting as the majority of rugby players were Euro-American (88%) in a predominately African American community. The remaining four percent (4%) of those using the soccer fields at Riverside were preparing for a softball game. At Christian Park the soccer field was used for playing and observing baseball. Baseball fields are in high demand at Christian Park forcing the usage of the soccer field for baseball.

There was a strong sense of encouragement gleamed from the observations in that the facilities were appropriate and used for positive recreation opportunities. There was no 'purple recreation' (recreation of a destructive nature) observed in the observations of urban and suburban parks. The need for park officials is to occasionally assess the park facilities and to plan for changes in recreational activities. For example, if there is a growth in the number of people who enjoy socializing and sunbathing near a pool then space needs to be added or planned for in future construction. If the community that the park services is not one that shows interest in tennis then perhaps the space should be used for other activities or left as open space. In addition, if there is a trend in the decrease in boys baseball, an increase in girls softball, and an increase in the interest in soccer, perhaps the space designated for one activity needs to be redesigned for another activity. In general, these communities seem to enjoy the park and the facilities available and with some alterations there will continue to be full and complete enjoyment of the various parks observed and in other parks across the country.

OPEN SPACE AND IMAGINATION

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Abstract: Open space is a necessary tool in our park system for fostering creativity and allowing for relaxation. In addition, open space areas allow people to exercise, find self-worth, and to use their imagination. This manuscript addresses the issue of what is happening in open space provided in several park settings. Do residents use open space as a place where they can play games, enjoy the grass, play with their dog, build community with one another, and more importantly exercise their imagination? Observational research was conducted to determine how open space was utilized in several communities to determine how the open space provided the public was being utilized.

Often those living in a large city begin to feel the city 'close in' on them. Traffic jams, exhaust, and the lack of a clear view of the sunset or sunrise can all have an effect on the urban dweller. One of the urban dweller's needs is to have and experience what is simply called "open space." Open space is "all areas of the city that are open to the sky and can therefore include parks, private gardens, school grounds, vacant land, parking lots, flat rooftop, streets, and so on" (Lavery, 1974, p.120). An apparent concern in today's society is a generation that lacks imagination in their play. As an example, many parents recognize that young children would rather play with basic household items than with structured apparatus or toys designed specifically for children. Older children are often attracted to simple activities such as climbing dirt piles and trees, playing in the water, and watching animals. The enjoyment children derive from such activities as playing tag or hide-and-seek consume endless hours and do not require a developed facility or structured environment.

The differences between the designs of parks and how they are actually used is significant for both social and economic reasons. Most parks provide an atmosphere that suggests freedom and open spaces, thus fostering creativity and relaxation. This open space context is sometimes limited by what appears in many locations as the planner's and landscape architect's need to provide structure or specific purpose to all park functions - activity zoning so to speak. While many recreation activities require facilities with specifications (i.e., swimming pools, playground equipment, basketball standards etc.) most informal sports and outdoor recreation pursuits need only space, adaptation, and imagination. Economically, many parks

contain facilities that get very little use or are used in ways not intended by the structure (softball field used for soccer) suggesting that perhaps our finances are better spent providing space that can be used for a variety of activities by the general public.

The need for open space to encourage creativity and imagination is also recognized as television and computers consume more and more of our children's leisure time. While television and computers are considered a necessity in our contemporary society, they can certainly detract from interaction with others, physical health, and social development. Fortunately, public parks with open space provide an outlet for social interaction and physical health.

To fully understand the purpose of open space it is important to understand the origin of the need for open space. With the growth of cities (due to industrialization) there began to appear in 1845, large Victorian parks on the edge or borders of cities and towns in Great Britain (Lavery, 1974). People realized that the industrialization of cities provided very little open space unless it was demanded and planned for. With the Victorian Era came a desire for improvement in the area of physical and spiritual growth among the urban dwellers (Theobald, 1984). The battle was set for designating large open space in our cities as increasing demands for housing resulted in fewer large parks and more smaller open spaces. (Lavery, 1974).

Open space management has five goals (Shivers & Hjelte, 1971). The first goal is the prevention of overcrowding of the land from congestion and structures. Open space offers breaks, edges, and open areas of different size and shape for the city. One objective would be to have unobstructed space in three directions. This unobstructed space would allow city dwellers an open view of topography in and around the city. Many of our larger cities have this possibility for very scenic views due to their development near oceans, lakes, rivers, or mountains. For example, land adjacent to these expanses of water can provide for open space with unobstructed views and need to be in public ownership. Likewise, the distant view of hills and mountains can play a similar role of open space. Thus, views of the hills and mountains need to remain unobstructed and be provided for urban dwellers to obtain a sense of an open environment and to have a scenic view.

A second goal for open space management was for the conservation of land and water areas to protect the natural environment. Open space, lessens the impact of pollutants so common in an industrial area. Open spaces, in an urban situation, can be used to teach the urban dweller an appreciation and hopefully a respect for the natural environment. One objective of protecting open space is "to preserve geological, horticultural, and historical features of sentimental, educational, and cultural interest" (Shivers et al., 1971, p. 243). It could be argued that many of our cities would have less open space was it not for the legally mandated protection provided for historical features. As an example, our nation's Capitol Washington, D.C., provides many educational, historical, and cultural features that enhance its attractiveness and are magnets for tourists.

The next goal is to provide an aesthetically pleasing area that can be enjoyed by all. The skyline of a city and the view within a city needs to contain breaks and gaps provided for by open space. If all our cities have are continuous' buildings with no areas "to breath" then there will be an increase in psychological stress among the urban dwellers. The need for open space "is based on our biological need to have contact with the natural environment in an urban setting and our psychological need for contrast and change in spatial surroundings and activities that most indoor environments do not provide" (Gold, 1985, p. 110).

The final goal is to provide space for outdoor recreation. Since ninety percent of our national parks are located in rural areas our urban dwellers, which have the greatest need, are limited in their ability to take advantage of them (Gold, 1985). "For the city poor, the nation's outstanding recreation resources - national parks and seashores, scenic rivers and wilderness areas - are light years away, and many state and local recreation areas also are beyond their reach. Many slum children, by the age of thirteen, have never been 800 meters from home" (Collins, Duffield, & Rodgers, 1975, p.99). The result is that the vast majority of those living in an urban area spend their leisure time in those urban areas. Simply stated each individual should be able to utilize the park's natural assets to their personal interests and needs as long as that adaptation does not deteriorate the environment or detract from the enjoyment of others. However, if the national park (and it's open space) is outside the urban dweller's reach then we need to bring open space to them.

The question remains: What is happening in Open Space provided in a park setting? During the summer months extensive research was conducted in Indianapolis and Bloomington Indiana area as well as in Angling Lake Ontario, a remote Native American village in the northern part of the Province. The purpose was to observe how the open space in various parks was used. The observations were classified into three categories or representative areas: Angling Lake represents a rural park experience, Bryan Park (Bloomington), Ellenberger (Indianapolis) and Broad Ripple (Indianapolis) represent suburban Parks and three Indianapolis parks (Brookside, Christian and Riverside) represent Urban Parks. The distinction of suburban and urban was based on the number of residents in the Zip Code area of the park. Those under 40,000 were classified as suburban and those over 40,000 were classified as urban. In addition the urban parks represent those parks, which are closer in proximity to the city center of a major metropolitan area. These parks were chosen for comparisons because they were similar in size (medium sized City Park) and were similar in the amount of space provided. There were two users of open space per observation in the rural areas (31 people/ 16 observations), 17 users per observation in suburban parks (422 people/25 observations), and nine users of open space per observation in urban parks (199 people/23 observations).

Open Space activities consisted of fishing, riding bicycles, relaxing on a park bench, relaxing on the lawn, playing games, frisbee, walking, walking the dog, and sun bathing (see Table 1).

Table 1: Comparisons of urban, suburban, and rural observations: Total numbers and Gender by activity engaged in.

Activity:	Rural			Suburban			Urban		
	Total #	Male	Female	Total #	Male	Female	Total #	Male	Female
Sun-Bathing				52	17	35			
Walking				67	35	32	52	28	24
Walking the Dog				64	33	31	5	3	2
Biking	14	7	7	6	5	1	14	11	3
Lawn Picnic				2	1	1	2	2	
Frisbee				13	10	3	25	25	
Playing	13	8	5	126	63	63	77	60	17
Relaxing				76	37	39	4	1	3
Park Bench				16	5	11	11	5	6
Fishing	4	4					9	7	2

Additionally, open space users of the urban parks were fifty-five percent (55%) African American, open space users in the suburban park were eighty-nine percent (89%)

Euro-American, and open space users in the rural park were all Native American (see Table 2).

Table 2: Comparisons of urban, suburban, and rural observations: Ethnicity (All rural participants were Native American.

	Suburban			Urban	
	Caucasian	African American	Other	Caucasian	African American
Activity:					
Sun-Bathing	52				
Walking	57	10		14	38
Walking the Dog	58	5	1	2	3
Biking	6			6	8
Lawn Picnic	2				2
Frisbee	13			23	2
Playing	124	2		35	42
Relaxing	53	23		1	3
Park Bench	12	4		7	4
Fishing				1	8

Data was also broken down by age (see table 3) of participants noting the activities that were found to be predominately young people (playing and relaxing in the

park), activities that were predominately young adults (sunbathing and frisbee), and those activities that were predominately adults (walking).

Table 3: Comparisons of urban, suburban, and rural observations: Age of participants by activity

Activity:	Rural		Suburban				Urban			
	0-7	7-14	0-7	7-14	15-21	21+	0-7	7-14	15-21	21+
Sun-Bathing					52					
Walking			6	8	16	37	6	10	14	22
Walking the Dog			2	4	20	38	1			4
Biking	7	7			1	5	4	5	5	
Lawn Picnic						2				2
Frisbee					11	2			11	14
Playing	8	5	39	41	23	23	21	32	4	20
Relaxing			29	7	8	32	3			1
Park Bench			1	1	2	12	1			10
Fishing	4						1	3	2	3

Fishing was an activity that was percentage wise (compared to population of park use) more common in the rural area. Many of the parks did not have an area for fishing and the youth of the Native American community grow up accustomed to fishing. Riding bicycles in the Open area seemed to be more common in larger parks where crossing the park to get to the other side or to the pool made riding 'cross country' quickest route. Children in all the areas used their bikes as a transportation mode.

Relaxing on a park bench was a common activity in the suburban and urban parks. This apparently served as a method of relaxation for workers in the mid-afternoon taking a break from work (i.e. UPS drivers). Relaxing on the lawn was an activity most common to the suburban area. Eighteen percent (18%) of open space recreators in suburban parks used the lawn for relaxation compared to two percent (2%) in urban areas. This could be the result of area residents feeling a higher sense of safety in suburban parks.

Playing various games in the open space was an activity common to all the environments of the study. This included

youth playing softball, soccer, rugby, or other games with friends, especially when there was a shortage of ball fields during the time they wanted to play. Additionally, users of the suburban parks and urban parks used the park for frisbee, whether in the form of a game or between two individuals for fun. Furthermore, walking around and through the park was common to all park settings. This activity seemed to be for personal time of reflection or socializing for friends. Those seeking walking as a form of exercise appeared to take advantage of the trails available in the parks.

Two activities common to the suburban parks were walking a dog and sunbathing. On a warm summer afternoon, the lawn at suburban parks, especially Bryant Park, was filled with people enjoying the sun. This possibly reflects the ethnic differences of the suburban and urban parks observed. This finding shows the need for suburban parks to provide open sunny areas for use by park residents for sunbathing and possible partitioning off an area for walking the dog as the two activities sometimes do not mix.

Overall the open space in all areas was utilized and apparently valued by the park visitor. It is also important to note that time of day did not seem to play a factor in the utilization of the open space in the parks. While activities (softball leagues) flourished in the evening hours the open space seemed to be used by individuals at all hours of the day. During the day, individuals would stop in the park to enjoy lunch or allow their little children a mid-day break and the evening would see an increase in the number of individual's walking or exercising. Without interviewing the open space user this researcher can only share his opinion that the open space seemed to be a valuable tool in all areas for instilling creativity, relaxation, self-worth, and community building. The outdoors is an amazing tool both at giving a sense of wonder and a sense of peace. This environment of outdoor space can contribute significantly to the welfare of the citizens of a community. The need for open recreation space is a valuable and necessary tool in allowing residents of all areas a place where they can play games, enjoy the grass, play with their dog, build community with one another, but more importantly exercise their imagination.

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Economics of Outdoor Recreation & Tourism

OPINIONS OF ELK VIEWERS ON A PROPOSED PENNSYLVANIA ELK HUNT

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Abstract: The Pennsylvania elk herd has grown to the size where a hunting season is being considered. Visitors to the principal elk viewing areas were asked their opinions about an elk hunt. Their responses were analyzed with respect to their personal profile and the characteristics of their visit. While roughly half the public supports a hunt, specific subgroups were found to have strong opinions on either side of the issue. People who accept hunting as a game management tool were more likely to approve of the proposed elk season.

Introduction

Elk, *Cervus elaphus canadensis*, were indigenous to Pennsylvania prior to the late 1800's. However, the original herds were eliminated by 1877 (Shoemaker 1939), largely as a result of unregulated hunting pressures and the wide-scale harvest of the state's forests.

The resurgence of second growth hardwoods throughout much of the state during the early 1900's gave cause for the re-introduction of elk to the new forest system. From 1913 to 1926, 177 Rocky Mountain elk (*C. e. nelsoni*) were introduced to northcentral Pennsylvania (Bryant and Maser 1982, Gerstell 1936, Latham 1954). A hunting season was established in 1923 and continued until 1932, when declining elk numbers caused it to be suspended. Through a concerted management effort, led by the Pennsylvania Game Commission, the herd increased to nearly 300 animals by 1996. In its 1999 survey, the Commission totaled nearly 500 elk (Cogan, 1999).

The current success of these unique animals has not gone unnoticed by the public. Elk are a source of continued interest and pride among residents and visitors to their range (Strauss et al. 1998, Lord et al. 1999). However with the expanded herd size, has come a call for reestablishing an elk hunting season. The Pennsylvania Game Commissions released its Elk Hunt Advisory Committee's

report in April of 2000. That report supports the establishment of an Elk Season (Cogan 2000).

In 1997, a study of the economic impacts of tourism associated with elk viewing was initiated by the School of Forest Resources at Penn State, supported by the Rocky Mountain Elk Foundation. As a part of this study, visitors were asked if they would support an elk hunting season.

Procedures

Random on-site interviews of the elk viewing public were conducted during a two year period from Fall of 1997 through Summer of 1999, in the Benezette/Winslow Hill observation area of Elk County, Pennsylvania. Over 900 surveys were conducted on 78 survey days over the two year period. These surveys ascertained the origin, travel itinerary, party size, expenditures, and allied recreational interests and expectations of the elk viewers in the area (Strauss, et al. 1998, Lord et al. 1999). Viewers were also asked their opinion about an elk hunting season. The response to this question was analyzed with respect to the demographics of the elk viewers.

Results

In responses to the question, "Would you support limited elk hunting outside of the major viewing areas?", 54% of the non residents responded positively (Table 1). Among resident viewers, only 45% supported a limited hunt.

Table 1. Percent of respondents approving an elk hunting season.

	Non Resident	Resident	Total
Hunter	63	52	62
Non Hunter	40	26	39
Grand Total	54	45	53

Twelve variables from the visitor survey were examined simultaneously with a logistic regression¹ to determine whether any sub-group of visitors were more likely to support or reject the elk hunting question. Three of these variables, age, total expenditures, and annual visitor days of elk viewing, were introduced as quantitative variables, with the remainder used as categorical variables.

The logistic regression indicated that six variables were statistically significant in predicting whether a person accepted or rejected the elk hunting proposal (Table 2). These included hunting over the past year, memberships in a local sportsmen's club, the National Rifle Association,

¹The logistic regression model analyzes the effects of a set of independent variables on a dichotomous (0,1) response variable.

Rocky Mountain Elk Foundation, the individual's age, and residence in the study region. Visitor days of elk viewing, expenditures on the trip, local cabin ownership, trip

importance, and membership in other conservation groups were not significant. Gender was of moderate importance.

Table 2. Results from the logistic regression of visitor characteristics influencing response to the question: Would you support limited elk hunting outside the major viewing areas?

Variable	Significance Level*
Hunter	0.001
Local Sportsmen's Clubs	0.006
National Rifle Association	0.029
Age	0.046
Resident of Region	0.048
Rocky Mountain Elk Foundation	0.053
Gender	0.225
Trip Importance 1	0.759
Trip Importance 2	0.432
Cabin	0.754
Conservation	0.923
Elk Days	0.972
Expenditures	0.993
Error	

*The significance level (p-value) indicates the probability that the variable had no effect on opinions on the elk hunting question. The lower the value, the more significant the variable. Trip importance was categorized as two variables by the model to account for the three possible values.

As might be expected there was, a strong correlation between some of the independent variables (Table 3). Of particular interest was local cabin ownership, which was correlated with the number of annual days viewing elk (0.201) and with trip importance (0.256). Another important relationship was the strong negative correlation between gender and hunting experience (-0.326).

As a follow-up, chi-square tests of independence were performed on the individual variables to determine whether the mean response of those within a particular group was significantly different from those outside the particular group when evaluated alone (Table 4). Because of the high correlations, these individual results may differ from the logistic regression.

Hunters

Participation in hunting over the past year, i.e. "hunters", was the most significant factor in explaining opinions about an elk season ($p = 0.001$). A Pennsylvania elk hunt was approved by 62% of hunters as compared to 39% of non-hunters. The 61% opposition rate among non-hunters was the highest among all tested groups. Mean approval among hunters and non-hunters was statistically different ($p < 0.001$).

Sportsmen Organizations

Visitors having membership in a local sportsmen's club were more likely to support a Pennsylvania elk hunt, with 66% approving. Non members had a 48% approval rating. The mean response among members and non members was statistically different.

NRA Membership

Visitors holding membership in the NRA were significantly more likely to approve of a Pennsylvania elk season than were non members ($p < 0.001$). The 70% approval rating by NRA members was the second highest of any significant sub-group. Non NRA members were slightly less likely than the general population to approve of the hunt (49% approving).

Age

The respondent's age proved to be a significant variable in the logistic regression, with younger visitors (<60 years old) more likely to approve of a Pennsylvania elk hunt than older visitors (>60 years old).

Local Residency

Residents of the two-county area were less likely to approve of an elk hunting season. Only 45% of residents approved of an elk hunt, with 55% opposed. In contrast, 54% of the non residents were in approval. The logistic regression assigned a significance level of 0.048 to this variable. However, the individual chi-square test produced a less significant 0.156 level. This situation indicated that residency became more significant after accounting for the effects of several other variables in the logistic regression. Over the two-year study, 90% of the visitors were non residents and 10% were residents.

RMEF Members

Only 7% of the audience reported themselves to be RMEF members. This audience, however, had the highest percentage approving a Pennsylvania elk hunt (79%). As

might be expected, non-RMEF members were similar to the general audience, and had a 51% approval.

Gender

Although gender was only moderately significant in determining opinions about a Pennsylvania elk hunt ($p = 0.225$ in the regression), the chi-square test indicated women's opinions on a Pennsylvania elk hunt to be significantly different from men's. The lower significance level in the logistic regression was due to the high correlation of gender with other variables. Once these stronger predictors are in the model, including gender did not add much more information. The 44% approval among women was the second lowest significant approval rate.

A caveat is in order. Only 27% of the groups interviewed had female respondents. Since 66% of the groups

interviewed were family groups, a male bias may be found in the responses.

Cabin Owners

The opinion of local cabin owners was of interest even though they did not prove to be significant in the logistic regression. A Pennsylvania elk hunt was approved of by 63% of cabin owners. Non-cabin owners had a 52% approval. The chi-square test indicated a moderately significant ($p = 0.033$) difference between local cabin owners and non owners. Similar to the situation with gender, if combined with the other variables in the logistic regression, local cabin ownership did not add significant information to the analysis. For example, 78% of cabin owners were hunters, as compared to 61% of the general public, and, as such, the hunting variable had a stronger influence.

Table 3. Pearson correlation matrix for the independent variables in the logistic regression.

	Elk Days	Hunter	Expenditures	Cabin	Resident	Trip Importance
Elk Days	1.000					
Hunter	0.071	1.000				
Expenditures	-0.104	0.084	1.000			
Cabin	0.201	0.102	0.012	1.000		
Resident	0.347	0.052	-0.165	-0.051	1.000	
Trip Importance	0.064	0.028	-0.146	0.256	-0.009	1.000
Gender	-0.005	-0.326	-0.028	-0.027	0.010	-0.118
Age	0.046	-0.076	-0.032	0.060	-0.004	0.061
NRA	0.044	0.213	-0.021	0.015	0.057	0.063
Local Sportsmen's Club	0.006	0.264	0.050	0.088	-0.019	-0.025
Rocky Mountain Elk Foundation	0.018	0.167	0.060	-0.002	0.167	0.015
Conservation Club	0.005	-0.082	0.066	-0.056	-0.066	-0.021

	Gender	Age	NRA	Local Sportsmen's Club	Rocky Mountain Elk Foundation	Conservation Club
Trip Importance						
Gender	1.000					
Age	-0.059	1.000				
NRA	-0.104	0.046	1.000			
Local Sportsmen's Club	-0.131	0.038	0.254	1.000		
Rocky Mountain Elk Foundation	-0.076	-0.008	0.048	0.069	1.000	
Conservation Club	0.056	-0.041	-0.050	-0.122	0.054	1.000

Table 4. Tests of significant factors affecting opinions about elk hunting.

Variable	Number of Respondents	Penna. Elk Hunt Approval (%)	Significance Level
Hunted in Past Year	522	61.9	0.000
No Hunting in Past Year	330	39.1	
Local Sportsmen Club Members	258	65.9	0.000
Non Member	594	47.5	
NRA Member	166	69.9	0.000
Non Member	686	49.0	
Resident of Region	65	44.6	0.156
Non Resident	787	53.7	
RMEF Member	56	78.6	0.000
Non Member	796	51.3	
Men	445	60.4	0.000
Women	165	43.6	
Local Cabin Owner	759	63.4	0.033
Not a Local Cabin Owner	93	51.8	

Summary and Conclusions

On the question of whether elk viewers would approve a limited elk hunt outside the major viewing areas, their opinion was mixed. Although the general audience provided a 53% approval rating, this was a narrow margin. The primary support for a Pennsylvania hunt was found among those belonging to the RMEF (79% approval), the NRA (70%) and other sportsmen's groups (66%). This was probably to be expected in that these groups largely accept the concept of hunting as a management tool. Hunting was also basic to their recreational preferences. Cabin ownership, while not significant in the logistic regression, was significant when tested alone with the t-test. This indicated that other predictors (e.g. hunting, membership in RMEF, NRA or other sportsmen organizations) were better at explaining variations in people's opinion.

In terms of those opposed to an elk hunt, 55% of the region's residents did not approve. Although local residency was not very significant by itself, it was a significant element when combined with the other variables in the logistic regression. The other noted group in opposition to elk hunting was women, with 56% against such a strategy. However, the opinions of this group may be better predicted by other characteristics as demonstrated by the relatively low significance in the logistic regression.

This analysis identified categories of people having either positive or negative opinions on a proposed elk hunt. However, we do not know the specific reason for their accepting or rejecting this proposal. This question was also asked prior to the announcement of a specific hunting proposal. Consequently, people were responding to a hypothetical hunting season. It is possible that as the details of a specific proposal become known, the viewing public's opinions will change.

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THE ROLE OF NON TIMBER FOREST PRODUCTS: A CASE STUDY OF GATHERERS IN THE EASTERN UNITED STATES

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Abstract- Non Timber Forest Products (NTFPs) play a key role in the lives and livelihoods of rural residents in or near forested areas. Consequently, organizations concerned with rural development have begun to look toward NTFPs as an opportunity for rural economic development. Concerned with the potential implications for the social and ecological structures that support NTFP harvesting, this work in progress plans to explore the culture and practices of gatherers. Using qualitative research methods including in-depth ethnographic interviews, we will document NTFP uses and users in the eastern United States. Individual case studies will give gatherers and micro-enterprise owners a voice to reveal their experience with and perspective on gathering. Natural resource managers and rural developers must have a clear understanding of the role NTFPs play in the lives and livelihoods of gatherers before they develop management plans.

Introduction

A NTFP is any product "constituting or derived from trees, shrubs, forbs, non-vascular plants, fungi, and micro-organisms that live in forest or grassland ecosystems (USDA Forest Service 1995)." These products may be thought of as falling into four categories; edibles, florals, medicinals, and ornamentals. Edibles include such products as wild mushrooms, fiddle heads, maple syrup, and huckleberries. Floral products such as ferns, mountain laurel and babies breath are used by gatherers to make crafts or sold to floral enterprises. Medicinal products are used for their healing properties. Ginseng, St. Johns Wort, and Echinacea are among the medicinal products used by gatherers for self-healing. Some of these products are also sold in the domestic market in raw and processed forms. Other products, for example boughs, black ash and beargrass are used to make ornamental products such as baskets, Christmas wreaths, and swags.

Gatherers harvest NTFPs as a commercial, subsistence or recreational activity (Love & Jones 1995). Trade, barter or sale of NTFPs in the local or international market can bring capital to people isolated in rural forested areas (Schlosser

& Blatner 1995). These financial resources are essential in areas where seasonal employment and high unemployment rates are prevalent (Emery 1998a). Subsistence gathering supplies households with raw products for personal use. Edible and medicinal products are essential to the gatherers' subsistence living. Recreational gathering is an important part of the tradition of gathering as many people gather with friends and family (Love & Jones 1995).

The voice and perspective of gatherers has been absent from discussions surrounding the NTFP industry (Love & Jones 1995). Instead, research into the viability of the NTFP industry has been grounded in the testimony of buyers and micro-enterprise owners. To understand the ecological and social sustainability of the NTFP industry the experience and knowledge of gatherers must be presented. Without an understanding of gatherers it is impossible to develop comprehensive, enforceable policy (Love & Jones 1995).

Presently, policy makers and rural development specialists increasingly strive to include NTFPs in economic development and land management plans. The establishment of such plans will likely have a significant impact on gatherers' access to and use of NTFPs. Consequently, the relationship between gatherers and the resources that support the NTFP industry must be further explored and better understood to encourage the development of plans that reflect the relationships between gatherers and NTFPs.

Literature Review

Non Timber Forest Products

Researchers have begun to adopt new methods and approaches to NTFP research (Anderson & Rowney 1999, Emery 1998a, Richards 1997, Richards & Creasy 1996, Anderson & Blackburn 1993). These new methods focus on gatherers' knowledge, experience and plant management regimes. With a better understanding of gatherers' practices and the culture of gathering, researchers assess the impacts of gathering on forest health and the relationship between the resource and the gatherer.

Richards' research looked at the knowledge of gatherers to explore the relationship between Tanoak mushrooms, also known as Matsutake, (*Tricholoma magnivelare*) and forest health. In-depth interviews with the Karuks, a tribe of Native Americans gathering and using Tanoak mushrooms, were conducted. The Karuks described the methods and rules that govern the gathering of Tanoak mushrooms as well as providing information on where and under what conditions the mushrooms thrive. In Richards' concluding arguments she noted the importance of traditional knowledge possessed by gatherers as a resource for forest researchers and resource managers (Richards 1997).

Research conducted by Anderson and Rowney tested indigenous harvesting regimes and their effect on the vegetative reproduction of edible plants. The study focused on the resource management strategies of Native tribes in

California. From the research it was found that the indigenous resource management regimes tested increased the density and population of *Dichelostemma capitatum*, commonly known as blue dicks (Anderson & Rowney 1999).

Research conducted by Emery in Michigan's Upper Peninsula explored the role that gathering plays in the lives and livelihoods of gatherers. Through in-depth interviews with gatherers Emery discovered the social values of gathering. Emery discusses the livelihood, cultural and recreational value of gathering to both Native American and European American gatherers. Emery suggests that these values might be displaced by large-scale commercialization (Emery 1998). Consequently, she suggests caution in the use of NTFPs as a tool for economic development in rural areas.

Emery also found many gatherers had accumulated a great deal of knowledge as information is passed from generation to generation of gatherers. Not only did these gatherers have considerable knowledge about the resources but they had implemented stewardship norms to sustain the resources that they depend on (Emery 2000). Emery suggests that local knowledge of individual gatherers be incorporated into policy, research and land management (Emery 2000).

Review of the literature illustrates the value and importance of incorporating gatherers' knowledge and experiences into ongoing research and policy making. Some gatherers possess a great deal of valuable information, without which the NTFP industry can not be fully understood. It is only through further research into the culture of gatherers that we can fully develop our understanding of the role that these resources play in the lives of gatherers and the relationship that lies between gatherers and the resource.

Hopefully a greater understanding of that dynamic will influence the creation of land management policies that reflect the relationship between gatherers and the resource.

Qualitative Analysis

The qualitative approach used in this study, grounded theory, was introduced in 1967 by Glaser and Strauss. Grounded theory generates concepts, theories and generalizations from data. Theory is developed from the bottom up as pieces of data are connected to provide a descriptive representation of the social phenomena under study. This inductive process is essential during the preliminary stages of grounded theory. Qualitative researchers implementing grounded theory, "do not search out data or evidence to prove or disprove hypotheses they hold before entering the study; rather, the abstractions are built as the particulars that have been gathered are grouped together (Bogden & Bicklen 1998)."

While the deductive reasoning process is not incorporated into the preliminary stages of grounded theory, it does play a role in the overall research design. Deductive reasoning is a useful tool in the later stages of grounded theory, during which hypotheses and theories may be tested against the data. "Generating theory from the data means that most hypotheses and concepts not only come from the data but are systematically worked out in relation to the data during the course of the research (Glaser & Strauss 1967)."

Through the combination of inductive and deductive processes, grounded theory both develops and tests theory. Dewey (1938) notes, "induction and deduction must be so interpreted that they will be seen to be cooperative phases of the same ultimate operations." Shelly and Sibert (1992) suggest this complementary relationship between deductive and inductive processes (figure 1).

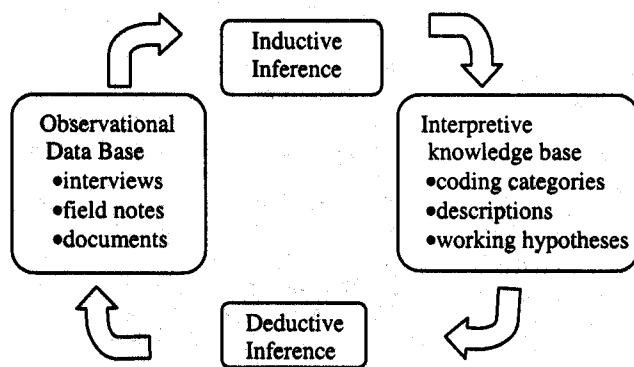


Figure 1. The induction-deduction process used in qualitative data analysis (after Shelly & Sibert 1992).

This approach to qualitative research is especially useful in studies exploring subjects where little previous research has been conducted. The inductive reasoning process allows the researcher to discover and explore phenomena and relationships between phenomena that they might not have been aware of previously. Consequently, unknown

relationships and meanings emerge as the research process generates theory through analysis of descriptive data.

Study Design & Methods

Concerned with the potential implications of land management policies and rural development plans on the

ecological and social structures that support harvesting of NTFPs, this work-in-progress has three main objectives:

1. to discover how and why people in the eastern United States gather,
2. to develop an understanding of the role NTFPs play in the lives and livelihoods of gatherers, and
3. to represent the experience of gatherers.

An invisible group, gatherers, are often difficult to locate and contact. Some gatherers live and work in remote rural areas. Others are not accessible by telephone. Legal and tax concerns can make some gatherers reluctant to talk about their work. Language barriers may, for example, hide Spanish speaking migrant workers.

Network sampling was implemented to overcome these difficulties and locate gatherers. Gatherers have been identified and located using a variety of sources from the academic arena to the arts and crafts community. Sources include state foresters, anthropology, sociology and forestry professors, NTFP researchers, members of the Society for Economic Botany, The Northern Forest Center, craft guilds, The Appalachian Studies program, and the Internet. Not only did these sources aid in locating and contacting gatherers but also in gaining gatherers' trust.

As gatherers are identified we make contact by telephone or through in-state representatives. We explain how we received their name and who recommended we talk with them about gathering. During the initial contact we also introduce ourselves and the project. After explaining the project and our interests, we ask each gatherer if he/she is willing and interested in talking with us about their gathering experiences. Interview sessions are scheduled and conducted at the convenience of the gatherer.

Through the combination of informal and formal interview styles, a consistent set of data is being collected. The structure and organization of the formal interview is rooted in an interview schedule, a list of predetermined questions that guide the interviews and maintain a consistency across each interview. Simultaneously, the implementation of open-ended questions associated with informal interview techniques allows the gatherer to determine the direction of the interview as they express their perspective on gathering. The combination of these two interview styles results in a set of data describing the culture of gathering that is reliable and thorough. Questions asked during the formal interview were adapted from Emery's previous research in the Upper Peninsula of Michigan (Emery 1998a). They include:

- What do you pick?
- What tools do you use to gather?
- Who do you pick with?
- When do you pick?
- What type of forest do you pick in?
- How do you use what you gather?
- Who owns the land you gather on?

These questions focus on the experience of gatherers. Data such as age, gender, employment, ethnicity and length of residence are also collected at the time of each interview.

Interview sessions last approximately one to two hours. At the conclusion of the interview each gatherer is asked to provide suggestions to improve the interview schedule or the process in general. These comments help to shape the interview sessions that will follow.

In keeping with the iterative approach of grounded theory, data analysis has begun in the early stages of research. As interviews are conducted and transcribed we are starting to review the text looking for patterns in the data. In a process known as open coding, code categories are developed and applied to interview transcripts as our understanding of gathering grows (Creswell 1998). ETHNOGRAPH®, a computer software program capable of single code and boolean searches, aids in further identification of patterns within the data.

We plan to produce ten case studies of individual gatherers from various regions throughout the eastern United States. Case studies will highlight a variety of products gathered in the various geographic and ecological regions. Each gatherer profile will also describe a key aspect of the relationship between gatherers and NTFPs. From this research we hope to develop our understanding of the culture of gathering and the role that gathering plays in the lives and livelihoods of gatherers. It is also our hope that this research will help to bring the perspective of gatherers to future policy making efforts.

Preliminary Results

Results from the first stage of interviewing and analysis focus primarily on the role that NTFPs play in the lives of gatherers. Interviews with a mushroom gatherer and a bough and fern gatherer have begun to reveal some of the relationships between gatherers and NTFPs. We present four examples of the roles that these products have played in the lives of two Vermont gatherers. We begin by describing a key aspect of gathering for that individual, which is then illustrated by a quotation taken from the interview. It is our hope that the voices of gatherers emerge through these quotes, accurately presenting their perspective and relationship with the resource. Quotations are followed by brief examinations of implications for rural economic development and land management.

Meeting Specific Needs

In 1946, Mary, a French immigrant, moved to the United State with her American GI husband. Several years later, following a divorce, Mary remarried and moved to Vermont. As the mother of five children living in rural Vermont, Mary began to gather ferns, princess pine, and boughs to make extra money for Christmas presents, birthdays and summer trips. Mary's work in a nearby forest supplied her with a modicum of financial independence and made it possible for her household to meet needs that exceeded her husband's income as a plumber.

"It was Christmas money, that is what it was. And the other was vacation money. We used to go to Canada with the money. So that is what it was."

Because owners of small NTFP businesses are dependent on gatherers to supply them with their raw material, it is important for them to understand this needs based relationship. The gatherer is not harvesting to maximize income. Rather he/she is working to meet a specific need. Once the gatherer has met that need, they will stop working. The business owner who understands this relationship is more likely to build a micro-enterprise that can succeed under such circumstances.

Protecting for future use

Although gathering was hard work at which Mary made little money, she enjoyed the opportunity to get out of the house and walk in the woods. Every morning from early spring to late fall, Mary's husband dropped her off at a forested area ten miles from their home. For several years, up until the death of Mary's husband, she returned to the same location to gather ferns and princess pine. Mary protected her site by keeping the location of her supply hidden from other gatherers. Mary's gathering norms were also important in protecting the resources she depended on during those years.

"You don't cut them all out. You leave some. You just cut the big ones. You know the long ones. The small ones you leave for the next year, the next crop."

Gathering norms and behaviors are influenced by the role gathering plays in supplying a needed source for supplemental income. Many gatherers implement harvesting methods which promote and encourage a healthy and sustained plant population. Gatherers take active steps to protect NTFPs as a result of the uncertainty behind when or if they might need to rely on the resource in the future.

Building Social Networks

Ron, a librarian, professional musician and radio show host, has spent the past thirty years following his interest in wild edibles. He first discovered a variety of wild edibles growing in his neighborhood as he walked to work. With a love for food and ample free time Ron began gathering wild edibles. Sharing these resources with friends and family has played an important role in developing and building social networks and relationships over the past thirty years.

"There are certain things, that you know if you find them and they are really something, then you give them away to people you love or you make nice dinners."

Gift giving and reciprocity are an important part of the gatherers' culture (Emery 98a). The creation of social networks ensures the survival of the group. Each member can count on the others in the social network to support them in times of need. This type of network is essential in

areas where high unemployment and poverty are prevalent (Emery 1998a).

Supplemental Income

To support his family, two young sons and wife, Ron often relies on multiple livelihood strategies. One strategy, gathering, contributes to his household by supplying a source of supplemental income and edible products for subsistence. Gathering Blackberries, used in pies and jams, Ron contributes to his family's subsistence. Occasional Blackberry bartering with Ben Cohen and Jerry Greenfield provided a supply of free Ice cream. As Ron became involved in hunting wild mushrooms this livelihood strategy continued. Sale and barter of wild mushrooms to restaurants and local grocery stores provides Ron and his family with free meal tickets and supplemental cash income.

"There have been times when I haven't had a lot of money when it was really nice to get lump, eighty or hundred bucks, it was like pennies from heaven."

Gathering is typically one of several livelihood strategies pursued by individuals and or households (Emery 1998). Gatherers turn to the resource most often when there is no other available source of income. Forest resources provide access to small amounts of needed cash income.

Conclusion

The exploration of the relationship between gatherers and NTFPs and the role they play in the lives and livelihoods of gatherers is necessary as rural developers and land managers devise policies and development strategies for rural areas located near forested land. It is our hope that the case studies emerging from this research will help rural developers, land managers, and entrepreneurs alike, as they will begin to understand the relationship between gatherers and the resource. This should allow them to see how that relationship might influence the plans they are developing whether they are business plans, rural development plans, or land management policies.

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DEGRADED VISIBILITY AND VISITOR BEHAVIOR: THE CASE OF NEW HAMPSHIRE'S WHITE MOUNTAIN NATIONAL FOREST

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Abstract: The issue of visibility degradation and its impact on visitors to national parks and wilderness areas helped prompt passage of the Clean Air Act Amendments of 1977. This act required the U.S. EPA, the states, and federal land managers of national parks and wilderness areas to protect and restore visibility in these areas. Yet, as Hill et al. state (1995, p.2) "AVisibility throughout the United States--especially in the Northeast--has declined substantially as human-induced regional smog conditions have become progressively worse..."

While degraded visibility may adversely impact visitors' experiences and pose questions of health effects, it is also possible that gradually declining visibility may reduce the number of visits to a site, which could lead to negative multiplier effects on the region's economy. Using data collected from a survey conducted in 1997 - 1998, this paper examines how (if at all) declining visibility in the White Mountain National Forest of New Hampshire has affected visitors' experiences and affected the probability of return visits. Photographs provided by the U.S. Forest Service of Mt. Jefferson, a 1,743 m peak in the Great Gulf Wilderness, were used to illustrate changes in visual range. Combining this information with data on travel costs and other trip expenditures, estimates are generated of the local economic impact of visibility degradation.

Introduction

Visibility impairment that results from human sources can be recognized as either haze or plumes. Haze is seen either in layers or uniformly, whereas plumes are recognized as emissions bands. This study focuses on uniform haze, as it is the primary cause of visibility impairment in the White Mountains.

While the Clean Air Act requires the U.S. Environmental Protection Agency, the states, and federal land managers of national parks and wilderness areas to protect and restore visibility in these areas (Latimer et al. 1983), the Act may not

be achieving these goals. In this paper, we discuss the results of a survey conducted over the summers of 1997 and 1998. One of the goals of this study was to determine if visitors to the White Mountain National Forest can differentiate between varying levels of visibility; that is, can visitors consistently rank photographs with varying levels of haze in order of decreasing visibility. A second goal of the survey was to see if visitors perceive visibility as unacceptable at some common threshold. The survey discussed here is modeled after the Denver survey (Ely, 1994).

The paper is organized as follows: the first section discusses the design of the survey and sampling methods. The second section presents results of the survey. The third section discusses how degradation in visibility might translate into impacts on the region's economy. The final section discusses extensions of this research which will more thoroughly analyze the problem.

Survey Design

The survey was designed to determine if individuals can accurately rate visibility conditions, and to estimate how they might value these changes in visibility. To accomplish this individuals were presented with a series of images of Mt. Jefferson to rate from clear to hazy and to rate as acceptable or unacceptable, based on how much haze they perceived in each photograph. Demographic information was also collected.

The photographs used in the survey were taken by an automatic visibility camera situated at 452m elevation Camp Dodge at the eastern end of the Great Gulf Wilderness, and were provided by the U.S. Forest Service. The photographs are centered on Mt. Jefferson, a 1,743m peak about 8 km due west of the camera site. Each photograph is accompanied by a measurement of optical extinction (Bext) measured using an OPTEC nephelometer, also provided by the U.S. Forest Service. Optical extinction, the physical measure of visibility, is a function of both light scattering and light absorption due to gases and particles in the air. High optical extinction indicates low visibility. Photographs depicting varying levels of visibility were generated via the WinHaze Visual Air Quality Modeler.

Surveys used in this analysis were collected at the Appalachian Mountain Club's Pinkham Notch Visitor Center, a primary trailhead to Mt. Washington 2 miles south of the Great Gulf Wilderness Boundary. Visitors were approached and asked if they would like to complete a questionnaire regarding their opinions of air quality. Willing visitors were then assisted in taking the survey, using a lap top computer for ease of administration and data entry.

While the primary focus of the study was to compare two methods of valuation of nonmarket goods (contingent valuation and conjoint analysis) and to use these techniques to estimate the value of visibility, travel cost information was also collected. In addition to the standard information on place of origin, travel expenditures by category, and whether the White Mountains were respondents' primary destination,

the following question was asked:

If there were a change in visibility in the White Mountains, (where visibility is reduced from photo A to photo B), would this reduce the number of trips you would make to the White Mountains? Please enter the number of trips (if any) you would no longer make.

By analyzing the results of this question in conjunction with the travel cost data collected, it was possible to derive a crude estimate of how much direct reduction in travel spending would be caused by reactions to visibility degradation.

Survey Results

General demographic characteristics of the pool of survey respondents are provided in Table 1. As can be seen, respondents= tended to be considerably wealthier and better educated than the population as a whole. Total spending per trip was quite high, on average (\$629); however, this figure was skewed by foreign visitors with extremely high travel costs. Travel expenditures accounted for the bulk of total spending (46.2 %), with spending on lodging (30.8 %) and food (23 %) also accounting for substantial dollar amounts.

Table 1. Characteristics of Survey Respondents

Gender	Male = 135 (34 %) Female = 70 (66 %)
Education	Some High School 6 (3 %) High School 16 (8 %) College 98 (48 %) Graduate School 85 (41 %)
Average Age	43.7 Years
Average Annual Income (Std. Deviation)	\$56,501 (84,688) n = 186
Miles Traveled (Std. Deviation)	508 (800) n = 205
Travel Spending/Trip (Std. Deviation)	290.73 (844.66) n = 199
Lodging Spending/Trip (Std. Deviation)	193.91 (432.76) n= 199
Food Spending/Trip (Std. Deviation)	144.45 (393.73) n=199
Total Spending/Trip (Std. Deviation)	629.10 (1,399.80) n = 199

Examining the origin of respondents, it is clear that a majority of respondents were from outside of New Hampshire (Table 2). Over one-third of respondents traveled to the White Mountains from outside of New England or even outside of the United States. These figures help explain the large

number of average miles traveled by respondents (over 500). However, less than 40 percent of respondents listed the White Mountains as their Aprimary destination.≡

Table 2. Survey Respondents= Region of Origin

Place of Origin	Number of Respondents (Percentage)	White Mountains as Primary Destination (% of Total)
New Hampshire	32 (16.1)	3.7
Other New England	90 (45.2)	14.0
Other U.S.	64 (32.2)	15.2
Non-U.S.	13 (6.5)	1.8

Visibility as a Determinant of Visitation

Degradation of visibility in natural areas such as the White Mountains can have deleterious effects on both quality of hikers' experiences and directly and immediately on hikers' health (Korrick et al. 1998), as well as portending potentially serious health and environmental effects on other areas. However, if visitors reduce or eliminate travel to an area because of visibility impairment, there will be direct and indirect economic impacts on the local and regional

economies. This is particularly true in a state like New Hampshire where tourism is the second largest industry.

In this survey, the average respondent made about 17 trips/year to the White Mountains (Table 3). In response to the degradation question noted earlier, 79 respondents (39 %) noted that they would reduce their number of visits by one or more trips per year. This translates to an average of 0.91 less trips/year/visitor.

Table 3. Travel Behavior and Effects of Visibility Degradation

Average Number of Trips/Year (Std. Deviation)	17.0 (150.8) n = 203
Average Number of Trips Reduced due to Degraded Visibility (Std. Deviation)	0.91 (1.83) n = 203
Spending Reduction of Sample due to Degraded Visibility (avg. no. of Trips Reduced X Avg. Spending/Trip X Sample Size)	\$116,213.64
Spending Reduction of Sample due to Degraded Visibility (avg. no. of Trips Reduced X Avg. Spending [exclusive of travel expenses]/Trip X Sample Size)	\$62,505.24

In order to determine the direct economic effects of these reduced trips, one must first make the assumption that results would not be subject to hypothetical bias; that is, respondents would actually do as they stated (Mitchell and Carson, 1986). If one can accept this assumption, the data set can be used to estimate the direct financial losses due to reduced visitation caused by visibility degradation. However, before simply multiplying the total number of A reduced trips by average spending per trip, it is prudent to determine if it is possible to identify specific characteristics of A reducers vs. A non-reducers and thus provide a series of weights to adjust the loss estimates.

To analyze this issue, a logit model was specified of the following form:

$$\text{CHANGE} = F(\text{gender, education, age, origin, income, primary, trips/year, total spending})$$

Here, *origin* refers to if the respondent came from New Hampshire, other New England, Other United States, and Outside of the United States, and *primary* is a variable equal to 1 if the White Mountains are the primary destination and 0 otherwise. The dependent variable, CHANGE, is equal to 0 if

respondents would not change their travel plans (number of trips) due to visibility degradation, and 1 if they would reduce the number of annual trips by one or more.

Unfortunately, the logit analysis did not reveal any clear patterns in the characteristics of those who would reduce trips compared with those who would not (Table 4). In fact, the only variable which was even of moderate significance (95%

confidence interval) was region of origin. The sign of this variable indicated that those who travel farther to reach the White Mountains would be *less likely* to change their number of annual trips due to degraded visibility. None of the other variables explained respondents' probability of changing their behavior.

Table 4. Logit Analysis of Trip-Changing Behavior. Dependent Variable = Reduction in Number of Trips/Year to White Mountains due to Visibility Degradation

Variable	Coefficient Estimate (Standard Error)	Asymptotic t-ratio
Gender	0.11607 (.34637)	0.3351
Education	0.26830 (.25483)	1.0529
Age	0.00344 (.00457)	0.7532
Origin	-0.39174 (.22948)	-1.7071
Income	0.00000001 (0.000002)	0.4801
White Mtns. as Primary Destination	-0.01006 (0.35355)	-0.0284
Trips	-0.01674 (0.01863)	-0.8983
Total Spending	-0.00030 (0.00028)	-1.0551
Constant	-0.46771 (0.66691)	-0.7013
Log-Likelihood Function	-106.41	
Likelihood Ratio Test, 8 d.f.	9.72091	
McFadden R ²	0.044	
Number of Right Predictions/Percentage of Right Predictions	98.0/0.59756	

A pairwise correlation analysis was also of little use in discerning relationships between variables (Table 5). No pairwise correlation was greater than .4; signs were generally consistent with expectations. Specifically, distance from the White Mountains was negatively correlated with annual trips

($\rho = -.274$); distance was also positively correlated with trip spending ($\rho = .343$). Neither of these findings is particularly earth-shattering.

Table 5. Pairwise Correlation Matrix, Change Behavior Model Variables (n = 164)

	Gender	Education	Age	Origin	Income	Primary	Trips	Change	Total
Gender	1.000								
Education	0.060	1.000							
Age	0.148	0.185	1.000						
Origin	-0.026	-0.046	-0.030	1.000					
Income	0.081	-0.053	-0.019	-0.004	1.000				
Primary	-0.102	0.155	-0.070	0.113	-0.078	1.000			
Trips	-0.081	0.109	0.028	-0.274	0.051	-0.048	1.000		
Change	0.055	0.084	0.087	-0.168	0.010	-0.016	-0.015	1.000	
Total	0.053	-0.007	0.008	0.343	0.115	0.045	-0.091	-0.124	1.000

Local Economic Impact of Visibility Degradation

Given the lack of ability to characterize respondents as to their behavior with regard to visibility changes, a number of assumptions are necessary to calculate the net loss in regional spending which might occur. If one assumes that the average visitor will make .91 fewer trips per year, and will spend an average of \$629.10/trip, then for this sample total direct losses to the region are

$$.91 \times 629.1 \times 203 = \$116,213.64 \quad (1)$$

Using more conservative figures, it might be assumed that most travel expenses noted in the survey accrue outside the region, particularly in the case of air or long auto trips. Therefore, calculating effects using the method in equation (1), excluding travel but including lodging and meals yields:

$$.91 \times (193.91 + 144.45) \times 203 = \$62,505.24 \quad (2)$$

Finally, since a majority of hikers noted that the White Mountains were *not* their primary destination in the area, it might be assumed that they would visit the greater region and spend their money elsewhere in the New Hampshire economy. If equation (2) is adjusted by the percentage of those listing the mountains as their Aprimary= destination, the impact is further reduced:

$$.347 \times .91 \times (193.91 + 144.45) \times 203 = \$21,689.32 \quad (3)$$

Thus, the impact of a degradation in visibility will vary widely depending on the assumptions used, ranging from about \$21,700 to \$116,214 for the sample considered. This of course is accepting the original assumption that respondents would actually reduce their number of trips to the area.

Discussion

Results of this study show that respondents clearly state that a decrease in visual range in the White Mountains would reduce their number of visits to the mountains. While the survey attempted to focus respondents= attention strictly on visibility issues, it is possible that other Ajoint products= were coming into play. Depending on assumptions used, the impact of these potential trip reductions could have direct annual impacts on the local economy of from \$21,700 to \$116,214 stemming just from this sample.

Further Research

This paper represents the first attempt at analyzing the travel cost data collected during the survey process. There are a number of refinements and additional analyses which could shed more light on the issue of how visibility changes might affect local economies:

- < While this sample was not representative of the general population, it is probably representative of hikers in the White Mountains. Using estimates of

total hiking activity in the region to extrapolate would give a better indication of the total direct impact of the visibility changes hypothesized on the region.

- < As collected, the spending figures noted represent only *direct* expenditures by respondents. Using these data to conduct an input-output analysis using IMPLAN would give an estimate of the *total* (direct and indirect) effects of changing visibility on the local economy.

- < The survey presented at the Pinkham Notch site presented respondents with a range of visibility changes. In this paper, these were aggregated into a simple degraded/status quo interpretation. Future research will incorporate measures of the actual magnitude of visibility reduction faced by each respondent to test if larger decreases in visual range would have more effect on trip reductions than smaller decreases.

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ESTIMATING RELATIVE VALUES FOR MULTIPLE OBJECTIVES ON PRIVATE FORESTS

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Abstract: Conjoint and other techniques were used to examine private forest-land owner's willingness to manage for timber and nontimber objectives. The objectives were to: maintain apple trees to benefit wildlife, protect rare ferns to enhance aesthetics and biodiversity, improve recreational trails, and harvest timber. Ecological objectives were found to be more important than objectives related to use. Acceptable trade-offs (relative values) are estimated among the various objectives and with respect to management costs. A mail survey sent to 1,250 nonindustrial private forest-land owners in Franklin County, Massachusetts, provides the basis for the analyses.

Introduction

Privately owned forests, which comprise nearly three-quarters of the forest land in the United States, are expected to play an important role in meeting future needs for timber, recreation, wildlife habitats, and many other forest-related benefits (USDA Forest Service 1988, 1995). There is concern that these lands may not meet their potential in achieving objectives related to overall ecosystem health and sustainability and in providing benefits that transcend legal and political boundaries, such as biodiversity, water quality, and some wildlife habitats. The large number of owners, diversity of objectives, increasing fragmentation, and nonmarket nature of many benefits pose problems in estimating what can be expected from these lands and in designing policy to influence behavior (Dennis et al. 2000). This is particularly true when coordination across ownerships is needed to achieve landscape-level objectives.

Surveys of private forest-land owner attitudes conducted by the USDA Forest Service show that many owners hold their woodland primarily for noncommercial reasons (Birch 1996). Commonly cited reasons for owning forest land include that it is part of their farm or residence, aesthetic enjoyment, wildlife viewing, and other forms of forest-related recreation. Landowner attitudes and motivations

suggest that they are favorably disposed to providing nontimber benefits and protecting the health of the forest ecosystem. However, a better understanding is needed regarding the relative importance that they place on various objectives, their willingness to incur costs associated with achieving these benefits, and how the relative importance of objectives differs between different types or groups of landowners.

In this study, we use conjoint techniques to solicit landowner preferences for management involving varying levels of timber harvesting, recreational trail improvement, apple tree maintenance to benefit wildlife, protection of a rare species of fern, and cost. A tobit model is used to estimate preferences. The tobit results are used to compute marginal rates of substitution (MRS), or the costs that landowners are willing to incur to achieve changes in the levels of other objectives.

Methods

The Dillman (1978) Total Design Method was used to design a survey that was mailed to 1,250 forest-land owners who own at least 10 acres of forest land in Franklin County, Massachusetts. In addition to questions on attitudes toward land management and demographics, each respondent completed a conjoint survey. The useable response rate was 61.3 percent.

Conjoint analysis is a technique for measuring psychological judgments and is frequently used in marketing research to measure consumer preferences (Green et al. 1988). Respondents make choices between alternative products or scenarios displaying varying levels of selected attributes. The utility of each attribute can be inferred from the respondent's overall evaluations. These partial utilities indicate the relative importance of each attribute's contribution to overall preference or utility. They can then also be combined to estimate relative preferences for any combination of attribute levels. Conjoint techniques are well suited for soliciting and analyzing preferences in environmental decisions that frequently entail tradeoffs between costs and benefits that are not represented efficiently in market transactions.

Forest-land owners in Franklin County were asked to rate four alternative management scenarios for a hypothetical property shown in a figure within the survey. The figure included an area of apple trees, a section of rare ferns, and a recreational trail that passed through the sample property. Each alternative was rated on a scale of 1 to 10, with 10 representing alternatives that they would definitely undertake and 1 those that they would definitely not undertake. Ratings of 2 to 9 were used to represent how likely they would be to undertake alternatives that they were not sure of. Each alternative varied by one or more of the following five attributes: the proportion of the apple trees to maintain on the hypothetical property, the proportion of rare ferns to protect, the extent of the trail network to improve, the extent of timber harvesting, and cost. An orthogonal array was used to create a succinct subset of attribute combinations that permits estimation

over the entire range of attribute values. The resulting 18 alternatives were assigned to questionnaires in equal frequency. Each attribute had one of the three possible levels appearing in parentheses and alternatives appeared as follows:

- Maintain (none/half/all) of the apple trees shown on the figure that benefit wildlife.
- Protect (none/half/all) of the acres containing a rare species of fern shown on the figure by not harvesting timber in this area or otherwise disturbing the ferns.
- Improve (none/half/all) of the trail network shown on the figure. Improvements, if any, would include the cost of building a footbridge over the stream and clearing scenic vistas.
- Harvest timber from (none/half/all) of the lands shown on the figure. Any harvest would be selective, designed to remove poorly formed and leave some high-quality trees; 25 to 30 percent of all trees would be removed.
- This option would have a net cost to you of \$ (50/250/500).

A random utility model was used to explain forest-land owner preferences. When presented with a set of alternatives, individuals are assumed to make choices that maximize their utility or satisfaction. The utility that the i th individual derives from the j th alternative (U_{ij}) can be represented as:

$$U_{ij} = X'_{ij}\beta + e_{ij} \quad (1)$$

where X_{ij} is a vector of variables representing values for each of the five attributes of the j th alternative to the i th individual, β is a vector of unknown parameters, and e_{ij} is a random disturbance, which may reflect unobserved attributes of the alternatives, random choice behavior, or measurement error. In the empirical study under consideration, a respondent's utility level (U_{ij}) for each alternative is not observed, but a rating (r_j) is observed that is assumed to proxy for his or her underlying utility.

Following McKenzie (1990, 1993) and others, the analytical capabilities of the conjoint rating model can be illustrated by assuming that rating (r_j) can be modeled as a linear combination of the variables representing the attribute levels:

$$r_j = a + b_1x_{1j} + b_2x_{2j} + \dots + b_nx_{nj} \quad (2)$$

The estimated partial utilities (b_n 's) measure the effect of a discreet change in the level of the associated attribute on overall preference. Relative overall preference for any alternative (combination of attribute levels) can be determined by summing across Equation 2.

The MRS is the rate at which an individual is willing to

trade one good for another while remaining equally well off (Nicholson 1978). The MRS or acceptable tradeoff of one attribute for another is determined by the ratio of the marginal responses. Setting the total differential of (2) to the point of indifference and solving:

$$dr_j = b_1dx_{1j} + b_2dx_{2j} + \dots + b_n dx_{nj} = 0 \quad (3)$$

$$dx_{1j} / dx_{2j} = -b_2 / b_1$$

yields the marginal rates of substitution or the acceptable tradeoffs for the respective attributes. If the linearity assumption is not tenable, the analyses become more complicated but the basic reasoning remains.

Results

Seventy-eight percent of Franklin County is forested, most of which is in nonindustrial private ownership. The average respondent owned 60 acres of forest land, and 70 percent of the parcels were less than 100 acres. Approximately 78 percent of the respondents lived within 5 miles of their woodland, 60 percent had owned their land more than 15 years, and one-third had a management plan. Approximately half of the owners were 55 or more years old, and 74 percent had completed at least 1 year of college.

The model was estimated using a tobit procedure where the dependent variable (r_j) is censored at 1 and 10. The explanatory variables (attributes) were coded 0.0, 0.5, and 1.0 for the proportions of apple trees to maintain, trail improvements, fern protection, and extent of timber harvesting. Cost was coded in units of \$100 (0.5, 2.5, and 5.0). Each respondent rated four alternatives for a total of 2,504 rated scenarios. The tobit results are shown in Table 1.

As expected, increased levels for each of the attributes except cost had a positive effect on ratings. The magnitude of the positive effects of maintaining apple trees to benefit wildlife and fern protection were significantly greater than those for trail improvements and extending the area of harvesting (which also may be interpreted as less restriction on harvesting). Landowners placed higher value on the ecological aspects of the alternatives than on use aspects. These findings are consistent with previous studies that suggest that nonindustrial private forest-land owners place high values on wildlife and other nontimber amenities (Birch 1996, Brunson et al. 1996) and with the attitudinal aspects of this survey (Rickenbach et al. 1998).

The results also may be used to examine preferential differences between various groups or types of landowners. Separate tobit models were estimated for men and women respondents (Table 2). Although the differences were not dramatic, gender did seem to influence preferences. Although both men and women favored protecting the ecological aspects of the property, women weighted these aspects more heavily than the men. This is demonstrated by the magnitude and significance levels for the

Table 1.--Tobit results (dependent variable is alternative rating with limit values of 1 and 10).

Explanatory variables	Coefficients	S.E.
Constant	1.166*	0.255
Apple trees	2.271*	0.209
Fern protection	2.361*	0.209
Trail improvement	0.717*	0.219
Timber harvesting	0.764*	0.209
Cost	-0.170*	0.046

N = 2,504

*All variables significant at the 1-percent level.

coefficients associated with apple tree maintenance and fern protection.

The marginal rates of substitution between cost and the other objectives are shown in Table 3 for the entire sample and for men and women. Overall, respondents were willing to incur significantly greater cost to enhance the ecological aspects of the property (apple tree maintenance

and fern protection) than to either improve the trail system or extend the area available for timber harvesting. The differential was greatest for the women respondents who were willing to incur \$15.41 and \$17.30 for 1-percent increases in apple tree maintenance and fern protection, respectively. By contrast, they were willing to incur \$3.91 to extend timber harvesting by 1 percent and \$4.67 to increase trail improvements by 1 percent.

Table 2.--Tobit results for men and women respondents (dependent variable is alternative rating with limit values of 1 and 10)

Explanatory variables	Men (N = 1,946)		Women (N = 507)	
	Coefficient	S.E.	Coefficient	S.E.
Constant	1.431*	0.283	0.591	0.594
Apple trees	2.144*	0.231	2.835*	0.499
Fern protection	2.065*	0.232	3.183*	0.488
Trail improvement	0.704*	0.243	0.719	0.504
Timber harvesting	0.639*	0.233	0.860**	0.484
Cost	-0.168*	0.051	-0.184**	0.186

* Significant at the 1-percent level.

** Significant at the 10-percent level.

Summary

A survey of landowner preferences in Franklin County, Massachusetts, indicated that protecting rare ferns and maintaining apple trees to benefit wildlife were more important aspects of management than improving

recreational trails or harvesting timber. Increasing the levels of the two ecologically related aspects contributed more to overall preference for a management scenario than increasing the level for either of the use-related aspects. Landowners also were willing to incur significantly greater costs to enhance these ecological aspects of the

Table 3.-- Marginal rates of substitution between cost and selected attribute (dollars per percent change in listed attribute)

Sample	N	<u>Attribute</u>			
		Apples	Ferns	Trails	Timber
All	2,504	13.36	13.89	4.22	4.49
Men	1,946	12.76	12.76	4.19	3.80
Women	507	15.46	17.30	3.91	4.67

hypothetical property than they were to enhance the use aspects. Although differences were not dramatic, women respondents expressed greater preference and were willing to incur higher costs to maintain apple trees and protect a rare species of ferns than the men were.

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COST CONSIDERATION AS A FACTOR AFFECTING RECREATION SITE DECISIONS

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Abstract: Because they are charged with providing opportunities for all potential site users, it is important that managers at public sites understand the characteristics and behaviors of different user groups. Recreationists who are sensitive to cost may be more sensitive to certain changes in policies, such as fees and other charges, than those who are not sensitive to costs.

Day users at six recreation sites in northwestern South Carolina were surveyed to determine use patterns and the factors that affect their outdoor recreation participation and site choice. Of particular interest is the effect of cost on their choice of sites and their levels of participation. Respondents were categorized based on whether they chose cost as the most important factor limiting their choice of outdoor activity locations. About 25% of the respondents chose cost as the most important factor. The mean annual household income of those choosing cost was almost \$15,000 less than that of those not choosing cost. Only 18% of these choosing cost had household incomes greater than \$60,000 versus 43% of those not choosing cost.

Respondents who chose cost appeared to spend more time at the sites at which they were sampled than those who did not choose costs. Both groups were similar in terms of number of individuals involved in each per visit, number of children at the sites, and ages of adults and children. Respondents choosing cost did not tend to avoid sites charging entrance or parking fees and, as a percentage of respondents, they outnumbered those not choosing cost on one of the three fee sites in the study. However, respondents choosing cost appear more likely than the others to be affected by fees.

Introduction

Fees for the use of public outdoor recreation areas can be a controversial issue for many reasons, including the fact that they raise questions concerning equity or fairness (Harris and Driver 1987, Warren and Rea 1998, Binkley and Mendelsohn 1987). Of concern is whether those who can least afford it

are affected the most by fees. Do fees cause recreationists to change their patterns of behavior by reducing their number of visits or by switching to different recreation sites? If so, are certain types of recreationists affected more than others? Public reaction to fees on public lands is of interest to public land managers as well as managers of recreation sites supplied by private firms (Chavez 1998, Lime et al, 1998). The U.S.D.A. Forest Service started its Recreation Fee Demonstration Program in 1996. This is a test project in which an entrance or parking fee is charged at selected recreation sites. Although numerous studies document entrance and use fees from many perspectives, the expansion of this practice on federal lands raises many questions concerning its influence on equity and site use.

This paper examines recreation participation and site choice decisions based on participants' perception of the relative importance of cost and time as factors limiting their choice of sites. Of particular concern is site switching in response to fees, and the role of substitute sites in that process. This paper focuses on identifying and comparing two groups of recreationists; those who are sensitive to costs and those who are not. These groups are profiled and compared in terms of demographics and recreation participation. The following questions are addressed:

What are the similarities between the groups?

How do they differ?

Does stated sensitivity to cost affect participation and site choice?

Is one group more likely to make changes in recreation participation because of fees?

If so, what type of action might be taken?

Study Area

The primary study area is the Andrew Pickens District of the Sumter National Forest in the mountains of northwestern South Carolina. Recreation sites in this part of the state are operated by the U. S. Forest Service; the South Carolina Department of Parks, Recreation, and Tourism; the Pendleton District Historical, Recreational, and Tourism Commission; the county (primarily Oconee County); the U.S. Army Corps of Engineers; and local municipalities such as the city of Walhalla. The South Carolina Department of Natural Resources operates a fish hatchery in the study area adjacent to one of the study sites. Clemson University maintains a locally popular site on the university forest and another at its botanical garden. Duke Energy Corporation operates a picnic area nearby at the site of a power plant and education center. The South Carolina Forestry Commission has a limited involvement in recreation use, but not primarily in the study area. A detailed description of the study area is given in Marsinko (2000).

Six primary sites and two roadside picnic areas were chosen for the study. The primary sites are; Yellow Branch (U.S. Forest Service), Stumphouse Tunnel Park (operated in 1998 by the Pendleton District Historical, Recreational, and Tourism Commission), Oconee State Park (South Carolina Department of Parks, Recreation, and Tourism), Chattooga

Picnic area and Fishing Pier (known to most local recreationists as the Fish Hatchery - U.S. Forest Service), High Falls County Park (Oconee County), and South Cove County Park (Oconee County). All of these sites provide day use opportunities.

Methods

A personal interview survey was conducted on the six primary sites (Yellow Branch, Stumphouse Tunnel Park, Oconee State Park, the Fish Hatchery, High Falls and South Cove County Parks) and two roadside picnic areas in northwestern South Carolina on weekends during the period July through October 1998. The focus was on day use, primarily picnicking and walking/hiking, activities that were common to all sites. Four of the sites and the two roadside picnic areas were along the same road and were thought to be substitutes for each other because of their relatively close proximity to each other and because they provided opportunities for similar activities. When the project was initiated, it was hypothesized that most users of these facilities would come from the nearby town of Walhalla or would come from areas east of Walhalla such as Seneca, Clemson, and Greenville, SC. During the first two weeks of the study, it became apparent that users did come from these areas, and two additional sites east of Walhalla were selected as possible substitutes, bringing the total study areas to six primary sites and two roadside picnic areas.

In the first phase of the study, 701 on-site interviews were attempted and 604 were completed. Of those that were not completed, 18 had been surveyed previously, 7 did not speak English, 14 were just leaving, and 58 refused for various reasons. We did not intend to resurvey previous respondents and were unable to survey the 7 who did not speak English. The response rate was 86% based on all observations and 89% calculated without the 18 who were previously surveyed and the 7 who did not speak English.

Respondents were split into groups that were and were not cost sensitive based on the following question in the survey. Which of the following is the most important factor limiting your choice of sites? Is it cost or time? The word 'fee' was not mentioned during the interview.

Results

Twenty five percent of the respondents were identified as cost sensitive. Of these, 17% cited cost only and 8% cited both cost and time as the most important factor limiting their choice of sites. The remainder cited time (70%), or said neither, or gave some other response. As a test of the classification criterion, responses from the following open ended questions were analyzed. What limits your choice of outdoor locations? Why don't you go farther from home? These questions were asked before the question used to split the dataset. Respondents classified as cost sensitive were significantly more likely to mention cost in the open ended questions, and those who were not cost sensitive were significantly more likely to mention time as limiting factors. Twenty two percent of cost sensitive respondents mentioned cost in the open ended questions while only 2 % of those who were not cost sensitive mentioned cost.

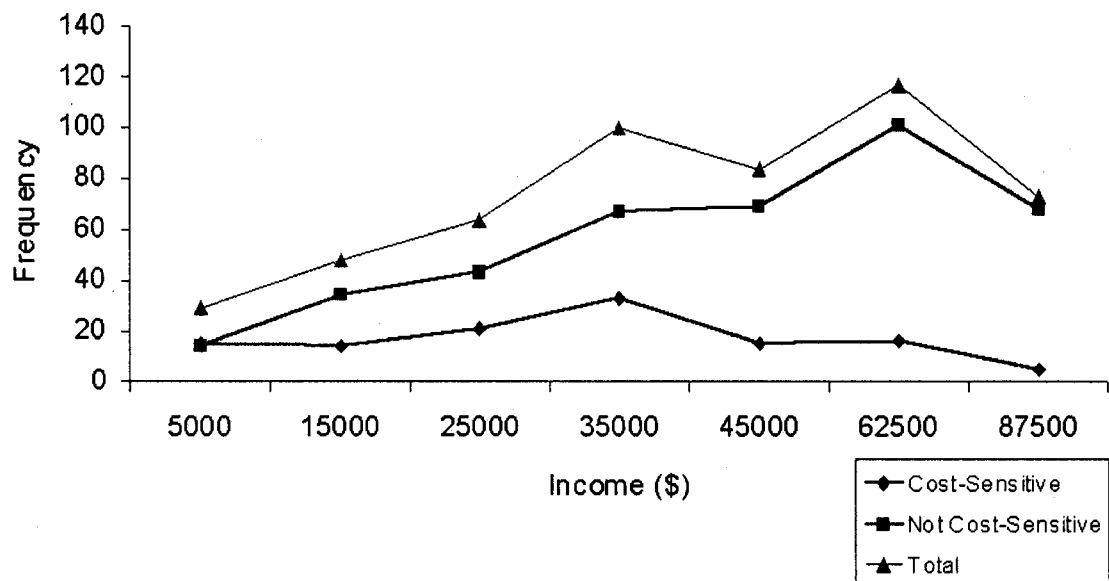
Cost sensitive respondents had significantly lower incomes than those who were not cost sensitive and they did not drive as far to the site on the day of the interview (Table 1). Cost sensitive respondents were significantly more likely to have children with their group at the time of the interview. There appeared to be slightly more racial/ethnic diversity among cost sensitive respondents. There are distinct differences in the frequency distributions of income between the two groups (Figure 1).

Table 1. General characteristics of respondents.

Characteristic	Cost-	Not Cost-
Income (\$) Mean*	34,146	48,970
Income (\$) Median	35,000	45,000
Miles driven one way (Mean)	29	36
Group size (Mean)	11	10
Children in group (%)*	78	68
Age of adults (yrs) Mean	41	40
Caucasian (%)	93	96

* significant at 0.05

Figure 1. Household Income



Respondents were asked how much they spent on their visit. If respondents asked the interviewer which categories of costs should be included, interviewers instructed respondents to include whatever they thought they spent. Respondents frequently discussed food, with many feeling that the cost of food should not be included because they would have to eat if they stayed home. The resulting responses are the respondents' perceptions of their costs. When all data are considered, cost sensitive respondents perceive that they spend more per trip and per adult (Table 2). When respondents who reported the top 10% of the costs are eliminated (dollar adjusted in Table 2), both groups spent the same average amounts. This indicates that more of the highest spending individuals occur among the cost sensitive respondents. When the top 10% of the group sizes are eliminated (group adjusted in Table 2), cost sensitive respondents appear to spend more per group. This indicates that more of the largest groups occur among the cost sensitive respondents. Of perhaps greater interest is cost sensitive respondents tendency to consider more costs. In an open ended question prior to the question just discussed, respondents were asked what types of costs they consider when they take this type of trip (but not specifically this trip). Cost sensitive respondents are likely to cite more costs, and are particularly more likely to cite food and gas (Table 3). They appear to have a greater awareness of a wide range of costs than those who are not cost sensitive. Both groups, however, are equally likely to cite entrance fees as costs they consider.

Table 2. Perceived Expenditures

Expenditure Category	Cost-Sensitive (Dollars)	Not Cost-Sensitive (Dollars)
Cost per trip	42	32
Cost per adult	10	8
Dollar Adjusted cost per	18	18
Dollar Adjusted cost per	6	6
Group Adjusted cost per	32	24
Group Adjusted cost per	11	8

Table 3. Types of costs cited by respondents in an open-ended question

Cost Type	Cost-Sensitive (percent citing)	Not Cost-Sensitive (percent citing)
Facility rental	7	9
Food	31	20
Gas	43	27
Lodging	19	14
Travel cost	2	2
Travel time	6	3
Activity fee	17	10
Camping fee	11	6
Entrance fee	28	28
Fee	3	6
Parking fee	11	6

Any fee type ¹	50	42
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¹Percent of respondents citing at least one type of fee

Cost sensitive and other respondents did not differ significantly in terms of years coming to the site at which they were interviewed, and visits to that site per year. However, cost sensitive respondents appeared to spend more time at the site. Three of the sites charged entrance fees. Contrary to our expectations, cost sensitive respondents did not favor the non fee sites (Table 4). Cost sensitive respondents were found at all sites and they were found at higher proportions than those who were not cost sensitive at one of the fee sites (High Falls County Park). Cost sensitive respondents may feel a greater attachment to the sites at which they were surveyed and/or feel they have fewer alternatives because 18% said they would stay home if the site were closed (vs. 12% of those who were not sensitive to costs).

Table 4. Location of respondents.

Location	Cost-Sensitive (percent surveyed at)	Not Cost-Sensitive (percent surveyed at)
Yellow Branch (USFS)	6	8
Fish Hatchery (USFS)	17	20
Oconee State Park (fee)	18	20
South Cove County Park (fee)	11	11
High Falls County Park (fee)	22	17
Stumphouse Tunnel Park	21	21

Cost sensitive and other respondents chose sites for similar reasons (Table 5), with safety for children and having scenery the most frequently cited reasons. Cost sensitive respondents were significantly more likely to consider lakes and drinking water to be important factors in selecting a site. This might explain the prevalence of the cost sensitive respondents in the fee sites as these were the only sites with lakes. This would suggest that cost sensitive respondents may be willing to pay a fee to be near a lake.

Most respondents, regardless of their cost sensitivity classification, had not experienced any changes that had caused them to change their patterns of activity (Table 6). Of those who did, the majority cited negative changes at sites that resulted in visiting less frequently. Cost sensitive respondents and respondents who were not sensitive to cost cited several reasons in similar proportions. Fees were the only reason for changing patterns of activity cited that differed significantly between the two groups, with cost sensitive respondents significantly more likely to cite fees as reasons for changing patterns of activity.

Table 5. Most important factors in choosing a site.

Criteria	Cost-Sensitive (percent citing)	Not Cost-Sensitive (percent citing)
Safe for children	60	52
Scenery	64	67
Mountain location	52	59
Close to home	49	49
Lake*	44	35
Few people	40	44
Able to get a picnic table	28	29
Maintenance	21	22
Drinking water**	13	8

* significant at 0.05 **significant at 0.10

Table 6. Reasons for changing patterns of activity.

Have You Seen Any Changes That Have Caused You to Change Your Patterns of Activity?

Response	Cost-Sensitive (percent citing)	Not Cost-Sensitive (percent citing)
No	71	77
Yes	29	23

Please Describe		
Factors	Cost-Sensitive (percent citing)	Not Cost-Sensitive (percent citing)
Crowding	5	3
Rowdy Behavior	1	1
Maintenance	4	3
Fees*	8	3

* significant at 0.05

Likewise, most respondents, regardless of their cost sensitivity classification, have not stopped going to a site that they used to visit (Table 7). Of those who did, cost sensitive respondents and respondents who were not sensitive to cost cited several reasons in similar proportions. Again, fees were the only reason cited that differed significantly between the two groups, with cost sensitive respondents significantly more likely to cite fees. If tables 6 and 7 are combined and adjusted to eliminate double counting, a total of 11.4% of cost sensitive respondents and 3.6% of those who were not sensitive to cost have been affected by fees to the extent of reducing or eliminating their use of certain sites.

Table 7. Reasons respondents stopped going to sites.

Is There Any Place That You Used To Enjoy Visiting But No Longer Visit?

Response	Cost-Sensitive (percent citing)	Not Cost-Sensitive (percent citing)
No	66	71
Yes	34	29

Please Describe		
Factors	Cost-Sensitive (percent citing)	Not Cost-Sensitive (percent citing)
Crowding	6	5
Rowdy Behavior	3	2
Maintenance	3	1
Fees*	6	1

* significant at 0.05

When asked what would cause them to go to a different site, cost sensitive and other respondents cited similar reasons (Table 8) and there were no significant differences between the two groups regarding any of the cited factors. Crowding is an important decision criterion for both groups (Tables 6, 7, and 8). It also appears that respondents may react to perceived unsafe conditions such as rowdy behavior by ceasing to visit a site rather than visit less frequently (Tables 6, 7, and 8). Respondents surveyed at fee sites cited fee increases as a reason to switch sites while those surveyed at sites without fees said they would switch if a fee were imposed (Table 8). When these responses are added, 8.2% of cost sensitive respondents and 4.8% of those who are not sensitive to costs cited fees as reasons that would cause them to switch sites.

Table 8. Factors that would cause respondents to go to a different site

What Would Cause You to go to a Different Location?

Factors	Cost-Sensitive (percent citing)	Not Cost-Sensitive (percent citing)
Crowding	20	20
Rowdy Behavior	9	6
Maintenance	7	7
Trees Cut	1	4
Nothing	12	12
Fee imposed	4.1	2.1
Fee increased	4.1	2.7
Fee imposed or increased ¹	8.2	4.8

¹Sum of the two preceding rows

Respondents were also asked what they disliked about the primary study sites and any other sites they went to. Respondents named all of the other sites they visited and told

what they disliked about each site. Cost sensitive respondents were significantly more likely to cite fees on the other sites and overall as factors that they disliked (Table 9). Table 9 contains information for all study sites except the site at which the interview was conducted, and for all other sites that respondents reported they visited.

Table 9. Fees as a problem with sites.

Site types	Cost-Sensitive (percent citing fees)	Not Cost-Sensitive (percent citing fees)
Study sites	2	1
Other sites**	8	4
Total*	10	5

* significant at 0.05 **significant at 0.10

Summary and Conclusions

Cost sensitive respondents have significantly lower incomes than those who are not sensitive. Cost sensitive respondents live up to their description and tend to consider more costs when they travel to recreation sites. By doing this, they might also be more accurate in their assessment of the total cost of their trip. Cost sensitive respondents are more likely to cite fees as costs and more likely to cite fees as a reason for changing their patterns of recreation activities (reducing or stopping visitation at a site or switching sites). Cost sensitive respondents appear more likely to be affected by fees, although they frequent fee sites. Both groups gave most of the same reasons for visiting sites, although cost sensitive respondents place more importance on lakes and the availability of drinking water, two factors often associated with fee sites. It is also possible that cost sensitive respondents feel a greater attachment to the sites at which they were surveyed and/or feel they have fewer alternatives because 18% said they would stay home if the site were closed (vs. 12% of those who were not sensitive to costs).

When asked what would cause them to go to another location, respondents chose reasons that paralleled those for the changes that they had already made. However, there appears to be an interesting difference between stated intentions and actions regarding fees for cost sensitive and other respondents. The stated intentions of respondents who were not sensitive to cost appeared to overstate their actions (4.8% stated they would stop visiting vs. 3.6% have stopped or reduced visits because of fees) while the stated intentions of cost sensitive respondents appeared to understate their actions (8.2% stated they would stop visiting vs. 11.4% have stopped or reduced visits). Although the study was not designed to measure the difference between stated intentions and actual behavior, it was also observed that respondents who openly complained about fees during interviews did not appear to be those who would fall into the cost sensitive category. Two cautionary notes for future research are in order. The complainers might not be the respondents who are sensitive to fees or likely to take action. Stated intentions might overestimate actions for those who are not sensitive to cost and underestimate actions for cost sensitive respondents. If

this is true and if it applies in general, using respondents stated intentions as a basis for management/policy decisions can provide an incorrect estimate of the implications of a fee increase, as well as the implications for equity. The opinions of those who are not likely to be affected by fees may be given too much weight while the opinions of those who are likely to be affected by fees may be given too little weight.

Although the proportion of respondents who have been affected by fees is not large, the fact that 11.4% of the cost sensitive respondents and 3.6% of those not sensitive to cost have been affected (stopped or reduced use) is important to managers and policy makers. The results show that cost sensitive respondents are significantly more likely to be affected, and because they have lower incomes, it raises concerns about equity. Only participants were surveyed. Considering the preference of cost sensitive respondents for sites with lakes, and the fact that only the fee sites in the study had lakes, an obvious question arises. How many people no longer participate at these sites because of fees? This was not addressed by this study and it would be a difficult question to answer. However, it would be an appropriate area for future inquiry.

Finally, the question about cost or time as the most important limiting factor, which was used to split the dataset, appeared to work well in this case. It proved to be a reasonably good approach to identifying cost sensitive individuals and it might be of value in other similar studies of outdoor recreation behavior.

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ATTENDANCE STRUCTURE AND ECONOMIC IMPACT OF THE NATIONAL ROAD FESTIVAL

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Abstract: The National Road Festival is a four-day event scheduled in mid-May along a 90-mile section of U.S. Route 40 within the southwestern Pennsylvania counties of Washington, Fayette, and Somerset. This 26-year tradition commemorates America's first federally funded highway and includes over 30 recreational sites and community attractions. The Festival provides a variety of music and dance events, reenactments, food and craft outlets, and two wagon trains that slowly, but surely, covered most of the Pike. In 1997, the National Road Heritage Park requested Penn State's assistance in establishing the size and distribution of the Festival's attendance, its economic impact, and recommendations on future operations.

A series of three Festival studies (1997-99) has shown a fairly consistent attendance pattern, ranging from 50 to 52 thousand site days of usage each year. Non resident attendance was 36% of this total. The 90-mile system is divided into three sections, with the central component capturing over 60% of the total attendance. Annual regional expenditures from residents and non residents averaged \$1.1 million, with nearly 50% originating from non residents. Regional impacts from the non resident trade averaged \$1.2 million annual. The Festival is closely aligned to the region's heritage but could benefit from added planning and coordination.

Introduction to the Study

The National Road Festival is unique in terms of its own heritage and complexity. This event commemorates America's first federally funded highway and covers the 90-mile section of U.S. Route 40 within Washington, Fayette, and Somerset Counties, known locally as the National Pike. The 1999 Festival marked its 26th year and spanned over 30 sites and communities along its route.

Starting in 1997, a series of annual studies was initiated by Penn State University for the purpose of determining the size and character of this audience and the impact of the event upon the region's economy (Strauss and Lord 1997, 1998). Through the support of the Pennsylvania Center for Rural Pennsylvania, Pennsylvania Department of Recreation and Conservation, and the Allegheny Heritage Development Corporation, the series included the 1997, 1998, and 1999 Festivals.

Literature Review

The economic impact of tourism has been investigated in the context of various regional and recreational activities. Stoll et al. (1988) examined the specific impact of recreational boating within the Texas economy. Their data base was developed from a mailed survey of companies in the boating industry. The ratios of total sales impact to direct impact (Type II multipliers) for different elements of the boating trade ranged from 2.3 to 3.3. The multiplier for the entire industry was 2.8.

Fesenmaier et al. (1989) analyzed the economic impact of all recreation travel along the Texas Gulf Coast. Texas residents were surveyed regarding their regional travel expenditures, with the average placed at \$57/visitor day. Total annual regional expenditures were \$586 million. Regional and state-wide impacts were estimated with a Texas input-output model and were placed at \$1.2 billion and \$1.9 billion, respectively.

Johnson et al. (1989) identified the economic impact of tourist sales within six key industries along the Oregon coast. Tourist sales receipts were obtained from a survey of regional businesses and were treated as direct impacts. Induced impacts were estimated on the basis of the personal and business income generated by the initial sales. However, indirect impacts were not included. The proportion of income developed from direct sales ranged from 0.16 to 0.92. The smallest coefficients were in service stations and retail sales, with the largest in the amusement, food service, and lodging sectors.

Bergstrom et al. (1990) determined the economic impact of non-resident state park visitors within several state economies. Their work was based on the national-level Public Area Recreation Visitors Study (PARVS) and used an IMPLAN (Impact Analysis for Planning) model for economic analyses. The Type II multipliers for the various states ranged from 1.80 to 2.46, with the size dependent upon the complexity of the state's economy.

Strauss et al. (1996) identified the economic impact of tourism within a nine-county region of Pennsylvania during 1995. Tourism was described on the basis of 26 activities, with total attendance amounting to 19.6 million visitor days. Non-resident visitors accounting for 41% of total attendance and \$284 million in regional expenditures (59% of the total). An IMPLAN model of the region established the direct sales impact of non-resident tourists at \$191 million and secondary impacts (indirect and induced) at \$369 million. From this, \$190 million was directed to wages and salaries in support of over 14,000 annual jobs. Seventy percent of the direct sales impact was placed in the lodging and food service sectors.

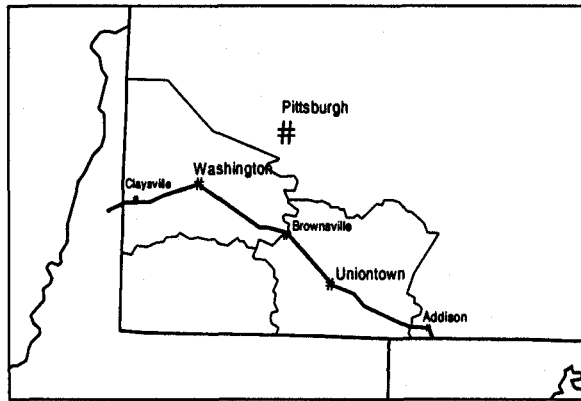
Certain variations are evident among these tourism studies in terms of their definitions of impact and economic modeling efforts. The more recent studies address the direct, indirect, and induced impacts of tourism expenditures, and are typically based upon an input-output model of the regional economy.

Objective and Procedures

The series of three annual studies identify the socio-demographic characteristics of the Festival audience and their related economic impact within a two-county region consisting of Fayette and Washington Counties (Figure 1).

Specific objectives of the project include:

- (1) Identify the resident and non resident attendance along the major sites during the four-day festival.
- (2) Evaluate the recreational preferences and patterns of this recreational audience.
- (3) Determine the expenditure profiles of resident and non resident visitors attending the festival.
- (4) Establish the economic impact of the non resident tourist expenditures specific to the two-county region.
- (5) Identify any major changes between the 1997, 1998, and 1999 Festivals.
- (6) Provide recommendations on the organization and



operation of future festivals.

Figure 1. Map of the National Road in Southwestern Pennsylvania.

For purposes of economic impact and demographic measures the region consisted of two counties, Fayette and Washington Counties. The sample design along the 90-mile "Pike" used a system of 21 Festival sites for gathering attendance. A field research unit, consisting of four to five persons, made attendance counts and conducted random interviews of visitors at each of these sites. One team member covered the entire four-day event for the collection of attendance data. Our first two-years of study had shown that most non resident visitors arrived on Saturday and Sunday. Accordingly, visitor surveys were only scheduled on these days. Survey protocol introduced the study to candidate members of the audience, identified the types of information requested, and asked whether the individual was willing to participate in the survey. The interviews secured the geographic origins, group size and composition, allied demographics, recreational patterns, and expenditure patterns of the visitors. From 250 to 300 surveys were obtained each year.

Attendance at the National Road Festival was developed specific to the 21 sites, for each of the four days, and during four daily time periods, 9 AM - Noon, Noon - 3 PM, 3 PM - 6 PM, and 6 PM - 9 PM. Attendance was estimated as the interviewers entered the various sites, with one team member assigned to collecting attendance at all sites on each day. Over 100 attendance measures were taken annually at the various sites during each of the festivals. These were entered to a matrix specific to their sites, dates, and time periods. These "point estimates" were expanded within their three-hour time period using a turnover rate calculated for the specific audience. The turnover rates were based on the average length of stay for the audience, as obtained from the on-site interviews. Basically, the turnover rate represented the division of the time period by the average length of stay. Comparisons of the three-hour totals among the various sites and between the various days identified the trend of attendance among the daily time periods and over the four days of the festival. These comparisons provided the means for estimating the attendance during time periods lacking any "point estimates".

Attendance was expressed in terms of "site days", representing one person's visit at a particular site during some portion of the day. As such, one person could register more than one site day on any given day by visiting a series of festival sites. Attendance was stratified into residents and non residents on the basis of the division found among the on-site interviews.

Expenditure profiles were developed for resident and non resident visitors at the various sites. Persons interviewed provided expenditures for their group and the entire day. If the person (or group) stayed overnight in the region, they were asked for their expenditures over the 24-hour period. If the person (or group) was on a day-trip, they were asked for current and projected expenses during that day.

Expenditure profiles were stratified by resident and non resident visitors and included the money spent at the site, plus the average of all other expenses, as divided by the average number of sites visited per day. This amount was divided by the group size in defining the average expenditure per person per site day. A weighted average expenditure/site day was developed among all sites, with the individual site attendance used as the weighting factor. Total expenditures for the festival were established through the multiplication of the weighted resident and non resident averages by their respective total festival attendance.

Economic impact was generated from the Impact Analysis for Planning (IMPLAN) system. IMPLAN is a computerized data base and modeling system that provides a regional input-output analysis of economic activity. It is particularly well suited in describing the economic impacts from tourism. This input-output model was developed by the USDA Forest Service and the Federal Emergency Management Agency to estimate the regional impact of management plans for national forests. It is commercially available from the Minnesota IMPLAN Group, Inc. on a fee basis (MIG, Inc. 1996).

Economic impact was determined from the regional expenditures made by non resident visitors to the festival. Essentially these expenditures represent the "export" of recreational services to persons outside the region. Although the expenditures made by resident visitors are identified within the study, these amounts are not credited as a source of tourism impact. Resident expenditures are an induced impact from other sectors of the economy, with their wages and salaries originating from these other sectors.

The economic impact of non resident expenditures are identified in terms of (1) the direct impacts from sectors serving non resident visitors, (2) the indirect impacts from other sectors having commercial linkages with direct sectors and, (3) the induced impacts from the regional expenditure of wages and salaries earned in the direct and indirect sectors. The wages and salaries that originate from the direct and indirect employment are then credited to the festival. Within this study, indirect and induced impacts are combined as "secondary impacts".

Impacts were also specified by the source of impacts, or festival sites, and by the placement of impact, in terms of economic sectors within the region. This provided a ranking of impacts by sites and sectors. In addition, the

latest version of IMPLAN provided an expanded social-accounting matrix that identified three levels of household income supported by festival-based employment and the flow of tax and transfer payments between the household and business sectors and the state/local and federal government

Results

Attendance

Total attendance at the 21 sites was fairly consistent on a year-to-year basis, ranging from 51,000 to 52,000 site days during the three study years (Table 1). A "site day" represented one person's visit at any given site during some portion of the day. Thirty-six percent of the site day visits were made by non residents.

The attendance on Thursday and Friday was about 12% of the total for the four-day festival (Table 1). The more active sites on these two days were: Scenery Hill, Addison, Claysville, Thistlecrest, Beallsville, Fort Necessity, and Waleski's Horse Farm. The primary activities at Addison and Claysville on the first two days were the evening wagon train encampments. The primary draw at Scenery Hill and Thistlecrest was the wide selection of antique and gift shops.

Table 1. Comparison of the 1997, 1998 and 1999 National Road Economic Impacts.

Year	Site Days				Non Resident Visitor Days		
	Attendance	Non Resident Attendance	Percent Non Residents	Average Expenditures	Sites per Visitor	Non Resident Attendance	Average Expenditures
1997	50,706	19,535	38.5%	\$22.32	1.86	9,846	\$44.29
1998	50,479	17,623	34.9%	\$19.02		11,022	\$30.41
1999	52,372	17,734	33.9%	\$29.31		7,904	\$65.76
1997 - 1998	-0.4%	-9.8%	-9.3%	-14.8%	-4.3%	12.0%	-31.3%
1998 - 1999	3.8%	0.6%	-2.9%	54.1%	18.5%	-65.2%	116.2%

Year	Impacts					Multipliers	
	Total Expenditures	Direct Output	Total Output	Value Added	Employ.	Retained	Output
1997	\$436,023	\$405,343	\$1,108,791	\$646,052		93%	274%
1998	\$335,227	\$305,034	\$814,292	\$470,304		91%	267%
1999	\$519,783	\$455,782	\$1,260,560	\$738,985	25.2	88%	277%
1997 - 1998	-23.1%	-24.7%	-26.6%	-27.2%	-27.9%	-2.1%	-2.4%
1998 - 1999	55.1%	49.4%	54.8%	57.1%	59.5%	-3.3%	3.7%

The remaining 88% of attendance was on the weekend, with the lead sites being the National Pike Steam Show, Scenery Hill, Braddock Flea Market, Thistlecrest Farms, and Waleski's Horse Farm. On Saturday, the "top five" sites typically provided about 55% of the daily festival attendance and, on Sunday, the "top five" provided closer to 70% of the daily total. As a broad generalization, the primary activities at these lead sites were retail and antique shops, flea markets, and concession stands (Scenery Hill, Thistlecrest, and Braddock) and a variety of entertainment and special events (Waleski's Horse Farm, and National Pike Steam Show).

The logistical center of the festival was the central portion of U.S. Route 40, west of Uniontown and east of Washington (Figure 1). In most years, the eight sites from Thistlecrest to Brownsville provided nearly two-thirds of the total attendance.

In terms of non resident attendance, the lead site were Scenery Hill, Waleski's, National Pike Show, Thistlecrest, and S Bridge. These "top five", typically attracted 60% of the total non resident attendance during the four-day event. The "next five" included Braddock Flea Market, Beallsville, Addison, Nemaquin Castle, and Claysville, for an additional 30% of non resident attendance. As such, the "top ten" sites provided close to 90% of the non resident

visitations. Six of the ten were located in the central section of U.S. Route 40 (Figure 2). Attendance in "site days" was reduced to "visitor days" through an analysis of the fractional time spent by resident and non resident visitors at each of the 21 sites. By summing the fractional time spent at each of the sites, and covering all sites, the study placed the resident attendance within a range of 16,000 to 19,000 visitor days per year. For non residents, the range was between 8,000 and 11,000 visitor days per year (Table 1). For the most part, the lead sites under the visitor day measure were the same as those under the site day measure.

Visitor Use Patterns

Resident and non resident visitors were fairly similar in terms of their respective average lengths of stay at any given site, the numbers of sites visited per day, and their group sizes. The one exception was the longer length of stay per site among non residents (3.8 to 4.0 hours) as compared to resident visitors (2.6 to 2.8 hours). Non resident visitor typically visited from 2.2 to 2.6 sites per day, and had 2.6 to 2.8 people per group. Resident visitors averaged from 2.0 to 2.3 sites per day, and had the same approximate range in group size. During all three years, site visitors who had the shortest times per visit typically visited more sites per day.

Site Evaluation

Most of the resident and non resident visitors had a high rating of the various Festival sites and events. During all study years, evaluations of all sites and events by residents and non residents typically showed over 85% with "very good" ratings, 10% with "acceptable" ratings, and less than 3% with "poor" ratings.

Expenditures

The average expenditure per site day for residents ranged between \$14 and 17 for residents and from \$20 to 29 for non residents (Table 1). These were weighted average

expenditures from all sites, with the weighting based upon individual site attendance. For non residents, from 55 to 60% of their expenditures was directed to on-site purchases, 15 to 20% to food, about 10% to lodging, 5 to 8% to transportation, and less than 5% to miscellaneous categories. Non resident expenditures were higher than for residents due to the added amounts in on-site and lodging expenditures.

Total resident expenditures ranged from \$500 to 600 thousand during any one year of the study and, for non residents, the annual totals were between \$335 and 520 thousand (Table 1). In most years, the Festival generated just over \$1.1 million per year in total expenditures within the two-county region.

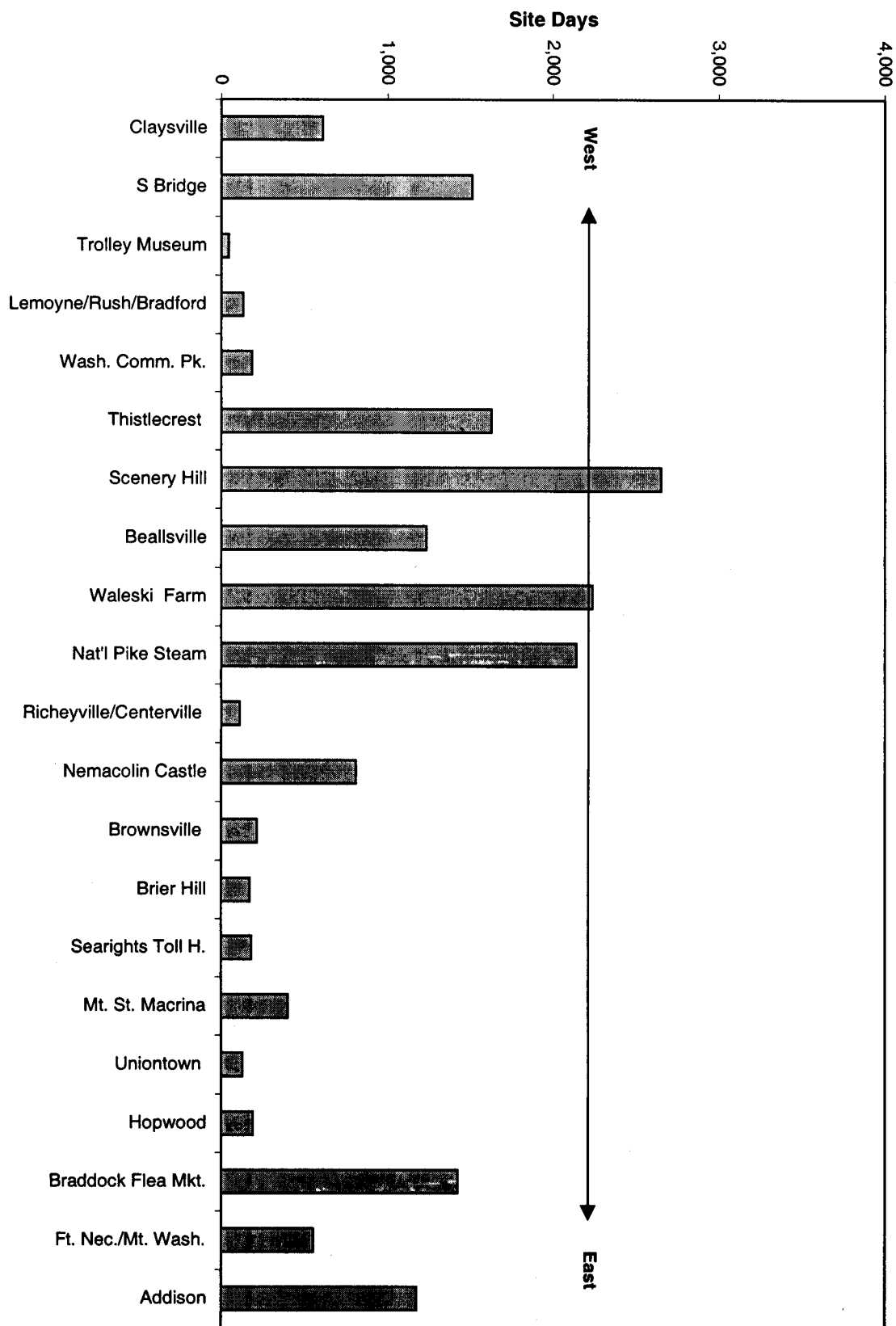
Economic Impacts

The regional sales impact from the four-day festival over the three-year period averaged just over \$1.0 million annual (Table 1). The annual impact patterns and distributions were fairly similar on a year-to-year basis.

During 1999 the total sales impact was \$1.3 million, with the direct impact at \$456 thousand and the secondary impacts at \$805 thousand. On a value added basis, the net impact was \$739 thousand. The salary and wage component of value added was \$447 thousand which, in turn, supported nearly 25 annual jobs on a full and part-time basis.

The placement of direct impacts in 1999 showed 59% in the Services group and 32% in the Wholesale and Retail Trade group. The secondary sales impacts were distributed over a wider array of groups, including Services (32%), Wholesale and Retail Trade (23%), Finance, Insurance, and Real Estate (20%), Transportation, Communications, and Utilities (11%), and Manufacturing (5%). For the most part, the secondary distributions followed the personal consumption pattern of the U.S. population (BEA 1990).

Figure 2. Total non resident visitor days by site/event for the National Road Festival, 1999.



Observations and Conclusions

The three Festivals had a fairly consistent economic character. Annual attendance, when measured in site days, was fairly constant, ranging from 50 to 52 thousand site days during each festivals. Non resident attendance was also consistent at 18 to 20 thousand site days. Although there were certain year-to-year changes, these were more the result of variations in the samples gathered in any one year, with the three year composite being a better measure of the overall set of events.

The following set of observations and comments were offered to the Festival organizers:

(1) There is a major disconnect between the various sites and activities along the 85-mile Festival Route.

The Festival is largely divided, geographically, into three parts. The first part, Claysville to Washington is the smallest in terms of sites and attendance. Although the town of Claysville has represented the western anchor to the festival route, there has been a certain loss of events and spirit in this community. The second part runs from Washington to Uniontown. Along this section there is a continuous series of Festival sites and recreational venues. This component of the Festival is the largest and most varied. The third section, from Uniontown to Addison, is somewhat unique in terms of its mountainous terrain and established sites. However, it really isn't until you arrived at Fort Necessity National Park that the festival is again formally advertised. Addison, at the eastern end of the route, personifies the Festival. Here is a small town's tribute to its own history and to that of the region. Their community spirit included four days of events; the Wagon Train encampment, Petersburg Toll House, the Methodist Church quilt show, community "pot-luck" dinners, the Firemen's Parade, and Sunday's 1860's baseball game.

Given these three sections of the Festival, and the various sites within each section, we did not find many "linkages" between the various sites within the Festival. Outside of the Festival brochure, there was a limited amount of information on the overall structure of the Festival and its focal points (i.e. sites and events). Potentially, some type of advertising standard, perhaps in the form of kiosks, might be used at the more popular sites within the Festival.

(2) Not all sites profit from the National Road Festival.

The general character of the National Road audience is not always well matched with the offerings of every tourist business. Several museums, craft shops, and antique outlets usually experience a decline in business during the weekend of the Festival. Several of the larger antique shops are now closed during the Festival weekend, contending that the Festival crowd is more interested in bargain hunting than antique shopping.

The proliferation of flea markets and yard sales throughout the Festival may be a mixed blessing. It would be difficult to defuse or discourage the spirit of private enterprise represented by flea markets and yard sales during the Festival. However, as the number of sale sites increased, so too has the traffic congestion surrounding these sites.

US 40 is a rather narrow artery and its limited roadside parking creates a safety problem.

(3) Some of the Festival sites reach full capacity during key periods of the festival.

There has been a general interest in expanding the overall size and attendance of the Festival. However, some of the more popular components of the Festival may already be operating at "full capacity" during certain portions of the Festival. On Saturday and Sunday afternoons, certain sites approach their maximum carrying capacity in terms of the physical size of the sites, their parking areas, and the traffic arteries outlying these sites.

Given these limits, any attempt to increase attendance will require either a re distribution of attendance at the more popular sites or the development of new sites and activities. Re distributions might be attempted through special events on alternate dates. Both the towns of Addison and Beallsville have shown a certain initiative toward expanding their agendas.

The following recommendations were made to the Festival Committee:

1. The central purpose of the Festival needs to be clarified with respect to the region.
2. The past series of Festivals need to be reviewed relative to their strengths and weaknesses.
3. The lines of responsibility for planning and implementing the Festival need to be revised.
4. Any expansions to the Festival need to be reviewed relative to ways and means.
5. Overall, communications with the resident and non resident public need to be improved.

The National Road Festival is a unique regional event and, as such, should continue to be organized and led by its own people.

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Tourism

A COMPARISON OF TOURISTS AND LOCAL VISITORS TO NATIONAL ESTUARINE RESEARCH RESERVE SITES

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Abstract: The National Estuarine Research Reserve system serves as a laboratory and classroom where the effects of both natural and human activity can be monitored and studied. Visitors to twelve National Estuarine Research Reserve system sites were surveyed to obtain information about demographics, participation, experience with the system, activities, and opinions. Comparisons were made between local respondents and tourists based on distance traveled to the sites. About 26% of the respondents were tourists. Almost all of the respondents were white, non-Hispanic and most were female with females slightly more prevalent in the local group. Tourists were slightly younger than locals and were more likely to work full time. About 48% of the tourists attended graduate school versus 35% of the local respondents.

Tourists visited the sites less frequently but spent more time per visit and spent more time at the site per year. The study sites were the primary destination for 66% of the locals and only 19% of the tourists, indicating that tourists were on multipurpose trips. Although more tourists (9%) made the decision to visit the site at least three months in advance (versus 3.2% of locals), 33% decided to visit the site on the day of the visit (versus 28% of locals).

In general, levels of satisfaction with the sites and likelihood of future visits were similar for both groups. Interest in education program topics was similar between groups except that tourists were significantly more interested in environmental issues and environmental ethics. Both groups considered it important to understand nature and the role of wildlife. Tourists placed significantly greater importance on the role played by wildlife and the existence of wildlife. Neither group placed much importance on hunting or trapping wildlife. Activities were similar between groups except that tourists were more likely to take photos, beach comb, swim, and bike, while locals were more likely to canoe and be involved with organized group programs. Both groups observed the same animals but tourists were more likely to observe marine mammals.

Introduction

Approximately 63 million people sixteen and older, participated in wildlife watching in 1996, spending about \$29.2 billion in the process (USDI, 1997). Money was spent on trip-related items such as food, lodging, and transportation, equipment such as binoculars and cameras and camping equipment, memberships in wildlife organizations, as well as books, magazines, dues, contributions, and land ownership and leasing. Spending for wildlife watching recreation increased 21% since 1991, although the actual number of American wildlife watchers decreased. (USDI, 1997).

As a result of the ongoing interest in observing wildlife, national, state, and local tourism marketing has evolved. The National Watchable Wildlife Program is a result of individual, community, nongovernment organizations and wildlife management agencies interest in observing wildlife. The program is a nationwide cooperative effort to combine wildlife conservation with America's interest in wildlife related outdoor recreation. The program was founded on the notion that people, given the opportunities to enjoy and learn about wildlife in a natural setting, will become advocates for conservation in the future (Great Outdoor Recreation Pages (GORP), 1997). The National Watchable Wildlife Program seeks to provide wildlife observation opportunities by establishing a nationwide network of quality viewing areas, complemented by uniform directional signing, and a companion series of state wildlife associated recreation guides known as the Watchable Wildlife Series. The goals of the Watchable Wildlife program are to provide enhanced opportunities for the public to enjoy wildlife on public and private lands, to contribute to local economic development, to promote learning about wildlife and habitat needs, and to enhance active public support for resource conservation (Hudson, 1996).

The National Estuarine Research Reserve (NERR) System is a national system of sites including estuarine waters, wetlands, and uplands, facilitated by a network of federal, state, and local partnerships. Through programs of stewardship, education, and research, the System enhances informed management and scientific understanding of the Nation's estuarine and coastal habitats. Through the System, the importance of estuaries are recognized and protected.

Although NERR educators have been successful in the development and delivery of educational programs, little is known about the general or independent visitors to NERR sites. Specifically, are they nearby residents using the sites for locally based outdoor recreation, or are they tourists from outside the area?

Recreation resource educators and planners are interested in identifying and profiling recreationists who visit areas such as NERR sites so that they can learn more about this population. The knowledge gained can be used to help meet the needs of current local residents and tourists participating in activities, to project future use and needs, and to implement marketing programs aimed at each group. The objective of this study is

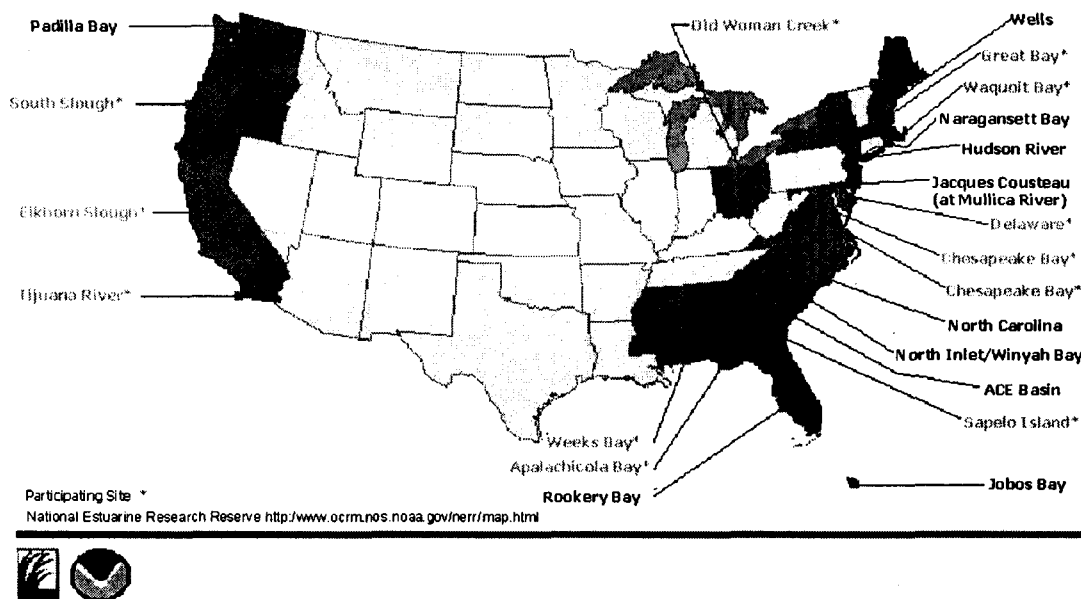
to compare tourists and local visitors to NERR sites in terms of demographics, participation, and attitudes. For the purpose of this study, tourists were defined as visitors who traveled 100 or more miles to the site.

Study Area

The NERR system is vast and many locations are remote. They are located on coasts around the country and in Puerto Rico. The NERR system serves as a laboratory and classroom where the effects of both natural and human activity can be monitored and studied. NERR sites contain protected acreage that cover varieties of natural resource environments. These natural resource environments include uplands, fresh marshes, salt marshes, forested wetlands, tidelands, sub tidal meadows, and open channels. Some

NERR sites have interpretive centers, trails, research buildings or labs, and other interpretive structures such as boardwalks, observation platforms, signs, historic buildings, and classrooms (USDC, 1996). All sites have some on-site programs such as school programs that go from the kindergarten level to the graduate school level. Some sites also provide off-site programs for school education and interpretive education. All sites provide on-site research opportunities and most provide off-site research opportunities (USDC, 1996). The 22 NERR sites that existed at the time of the study as well as those that participated are found in Figure 1.

Figure 1. National Estuarine Research Reserve System



Methods

Due to the geographic distribution of NERR sites and the variability of resources at each site, a mail survey was used to collect data. Education coordinators at the 22 NERR sites were contacted by e-mail and asked to supply names and addresses of individuals who visited that particular NERR site in 1997. Of the 22 NERR sites, 12 could provide names and addresses of visitors by way of registration books.

A total of 3,766 names and addresses of individuals who were not part of an organized program or group were submitted by the education coordinators. Of those, 1,086 names and addresses were legible and complete. A goal of

approximately 400 completed questionnaires was set due to the needs of NERR coordinators and the research budget and time constraints. The 1,086 names and addresses were reduced to 886 names based on an anticipated response rate of fifty percent.

A field pilot study of questionnaire items was conducted in the Spring of 1998. Other questions were pilot tested in the field in June of 1998. The mail survey was conducted next. Then, a nonresponse survey was conducted.

A modified version of the Dillman's (1978) ATotal Design Method (TDM) was used to administer the questionnaire. This consisted of an initial first class mailing, which contained a cover letter, an eight-page questionnaire, and a

self-addressed, stamped return envelope. A reminder post card was mailed one week later. Two weeks following the post card, a second cover letter, survey instrument and postage-paid envelope were mailed. There was no incentive included and the respondents were given the opportunity to receive a copy of the study results if they wished by signifying so on the return envelope when they mailed the questionnaire back.

The total number of questionnaires completed and returned was 383. The response rate (adjusted for incomplete returned questionnaires and underage respondents) was 46.7%. A total of 53 respondents asked for results of the study. The Statistical Package for the Social Sciences (SPSS) 8.0 was used for statistical analysis.

The results of the nonresponse followup indicated no difference between respondents and nonrespondents in most respects. However, nonrespondents were significantly more likely than respondents to prefer to view wildlife from a distance and in a natural environment. Respondents preferred to be as close as possible to wildlife. As a result, some caution should be used in interpreting the results.

Results

Local respondents (traveled less than 100 miles to the NERR site) and tourists differed in many respects. Locals were slightly older and more likely to be female (Table 1). Almost

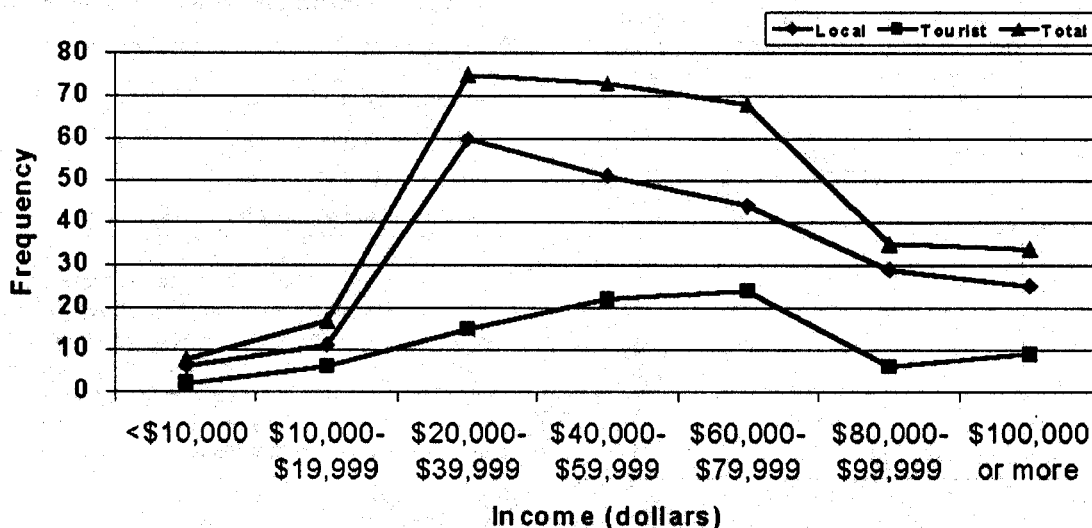
all respondents were white (non Hispanic).. Although the mean education level was about the same, tourists were more likely to have attended graduate school. Tourists were also more likely to be employed full time and less likely to be retired. The household income of locals peaked at \$20,000-\$39,999 while that of tourists peaked at \$60,000-\$79,999 (Fig. 2).

Table 1. Characteristics of Respondents

Characteristic ¹	Local	Tourist
Age (mean years)	49	46
Female (%)	65	58
Married (%)	67	72
White, not Hispanic (%)	96	97
Education (mean years)	17	18
Graduate School (%)	35	46
Employed Full Time (%)	50	69
Retired (%)	21	14

¹ no significant differences. Individual cells of frequency tables not tested.

Figure 2. 1997 annual household income before taxes



Tourists traveled an average of 646 miles to the NERR site while locals traveled an average of 28 miles (Table 2). Although these distances are significantly different, this would be expected because distance was used to segment the data. Tourists spent more time at the site, but the differences were not significant. However, tourists spent significantly more time (days) per trip and made significantly fewer trips per year. These results are in keeping with other studies, which have shown that those who live farther from a site tend to stay longer at the site and spend more days on a trip. The bottom part of Table 2 was created by multiplying the top three lines in the table by the fourth line (visits per year) resulting in estimates of totals for the year. Although locals take more trips per year, tourists spend more days per trip and per year.

Table 2. Distance traveled and time spent at sites by respondents.

Category	Local	Tourist
Distance to site (miles)*	28	646
Time at site (hours)	3.7	10.8
Time per trip (days)*	1.5	6
Visits per year (visits)*	2.2	1.4
Distance per year (miles)	62	904
Time at site per year (hours)	8	15
Total trip time for year (days)	3	8

* significant at .05

About two thirds of the locals and only about one fifth of the tourists considered the site to be their primary destination (Table 3). This means that 81% of the tourists are on multipurpose trips when they visit the site and that, for 81% of the tourists, the site is not the primary purpose of the trip. Tourists are more likely to travel with family and less likely to travel with friends. More tourists plan their visit to the site more than three months in advance, but more tourists decide to visit on the day of the visit.

Table 3. Trip Related Decisions. (Percent)

Decision	Local	Tourist
Site is primary destination*	66	19
Group type		
Family	46	57
Friends	16	12
Decided to visit		
Day of visit	28	33
More than 3 months prior to visit	3	9

*significant at 0.05

Locals were significantly more likely to obtain trip information by calling the site, referring to a site newsletter, or through the media (Table 4). In fact, few tourists obtained trip information from any of the listed means. Respondents were not asked about the Internet as a source of site

information.

Table 4. How Respondents Obtained Trip Information. (Percent)

Method	Local	Tourist
Called the site for information [~]	9	3
Requested information be mailed	4	3
Referred to information collected in past	11	7
Referred to newsletter from site*	14	4
Heard about site through media [~]	13	6

*significant at 0.05 [~]significant at 0.10

Both tourists and locals were about equally satisfied with their visit and both expressed about the same likelihood of making another visit in the future (Table 5). The scale used for this and other tables ranges from 1 through 5 with 5 being the highest or best level and 1 the lowest or worst. Thus 3 can be thought of as average or mid-range. Respondents= satisfaction with observing and/or photographing wildlife is lower than that for the entire trip (Tables 5 and 6), but it is above the mid-range. The likelihood of returning to observe and/or photograph wildlife (Table 6) is about the same as the likelihood of a future visit (Table 5). Locals and tourists were almost identical in their views of observing and/or photographing wildlife.

Table 5. Respondent expectations and satisfaction regarding visit. (Mean of scale 1-5)

Category	Local	Tourist
Visit met expectations	4.0	4.1
Overall satisfaction with visit	4.0	4.0
Likelihood of future visit	3.8	3.7

Table 6. Observing/Photographing wildlife. (Mean of scale 1-5)

Category	Local	Tourist
Importance of activity	3.2	3.2
Met expectations	3.6	3.5
Satisfaction	3.5	3.5
Likelihood of returning for activity	3.6	3.6

Locals and tourists shared about the same levels of interest in most topics at the sites (Table 7). Tourists expressed a significantly higher level of interest in environmental ethics and issues and in the cultural history of the area. Locals might be expected to be less interested in the cultural history of the area because they are likely to be exposed to the cultural aspects of the area on an almost daily basis.

Table 7. Interest in Topics. (Mean of scale 1-5)

Topic	Local	Tourist
Estuary ecology	3.5	3.6
Threatened and endangered species	3.8	3.9
Plant identification	3.5	3.5
Animal identification	3.7	3.7
Environmental ethics*	3.3	3.6
Environmental issues*	3.5	3.7
Prescribed burning	2.9	2.9
Habitat restoration	3.7	3.9
Water pollution	3.7	3.8
Natural history of area	3.8	3.9
Cultural history of area	3.5	3.8

*significant at 0.05 **significant at 0.10

Respondents were asked about the importance of various aspects of wildlife. Non-consumptive aspects are listed in Table 8. There were very few significant differences between locals and tourists, and those that were significant were relatively weak (.10 level). Appreciation for the role and existence of wildlife are very important (4.5-4.6). Tolerance of the nuisance, safety hazards, and damage aspects of wildlife are lower, but still above the mid-range (3.4-3.9). Benefit from wildlife recreation to local economies is just above the mid-range.

Table 8. Importance of Wildlife. (Mean of scale 1-5)

It is important to me that	Local	Tourist
I appreciate the role of wildlife	4.5	4.6
I know wildlife exists in nature	4.5	4.6
I tolerate most wildlife nuisance problems	3.6	3.5
I tolerate most levels of property damage by wildlife	3.5	3.6
I tolerate personal safety hazards associated with	3.7	3.9
I understand more about the behavior of wildlife	4.1	4.2
Local economies benefit from wildlife recreation	3.3	3.4

**significant at 0.10

The other end of the importance scale can be seen in Table 9. Consumptive activities such as hunting and trapping are not important to locals or tourists at these sites. Although the activities are unimportant, respondents do not appear to be against the activities as evidenced by the higher score given to the management of game animals for harvest.

Table 9. Importance of Consumptive Activities. (Mean of scale 1-5)

It is important to me that	Local	Tourist
I hunt game animals for recreation	1.8	1.7
I hunt game animals for food	1.8	1.7
I trap fur bearing animals/sale	1.5	1.3
Game animals are managed for harvest	3.4	3.4

**significant at 0.10

Tourists were more likely to participate in photography, bicycling, beach combing, and swimming, and less likely to participate in canoeing (Table 10). The most popular activities for tourists and locals at the sites were observing wildlife and walking. These were the only activities in which over half of the respondents of both groups participated. Riding and photography were the next most popular activities for locals but slightly fewer than one third of the locals participated in these. Half of all responding tourists participated in photography and about one third took pleasure drives.

Table 10. Participation in Activities. (Percent)

Activity	Local	Tourist
Observed wildlife	61	53
Photography*	30	50
Birding	31	28
Walking	60	60
Hiking	23	20
Pleasure drive	27	32
Canoeing*	10	2
Bicycling*	2	7
Beach combing	16	26
Swimming*	3	11
Picnic	11	8
Meditated	7	7

*significant at 0.05 **significant at 0.10

Sightseeing was the most common primary reason for visiting the site for both locals and tourists (Table 11). Locals were considerably more likely than tourists to visit the site in order to be in a natural environment (the individual rows in this table were not tested for significance). Tourists would logically be less likely to visit these sites for the primary purpose of being in a natural environment. For locals, these sites are convenient natural environments. Tourists who simply wish to get away to a natural environment probably find convenient alternatives closer to home.

Table 11. Primary Purpose of Trip to Site. (Percent)

Purpose of Trip	Local	Tourist
Sightseeing	34	35
Participate in educational	13	10
Observe or photograph wildlife	13	15
Learn more about estuaries	10	11
Be in a natural environment	19	13

Summary and Conclusions

This study compared tourists and local visitors to NERR sites. Demographically, tourists are slightly younger, have higher incomes, are more likely to be male, to have graduate education, to be employed full time, and less likely to be retired. Tourists take fewer, but longer trips, and spend more time on site per trip. On an annual basis, tourists spend almost three times as many days on trips, travel over 10 times as far, and spend almost twice as much time on site. Although the study did not address monetary expenditures, it is likely that tourists spend more money on food, lodging, and transportation, and that some of these expenditures occur while in the local area. Expenditures by tourists in the local area would likely be of interest to local planners and policy makers and would be a logical avenue for future research.

Tourists appear to be more interested than locals in environmental issues and ethics. Both have similar attitudes and values regarding the importance of wildlife. Neither appear to hunt, but neither appear to be against hunting. On-site activities are similar for each group except tourists are more likely to participate in beach combing, photography, swimming, and bicycling while locals are more likely to participate in canoeing, self-guided nature walks, and organized group programs.

Tourists and local visitors appear about equally satisfied with the site and equally likely to return. They visit sites for similar reasons. For most tourists, the site visit is part of a longer trip and for many, the decision to visit is made on the day of the visit, presumably while they are in the area. This indicates that those wishing to attract more tourists may be able to do so through local marketing means such as signs, and brochures at welcome stations, hotels, and restaurants. More tourists than locals plan their trips over three months in advance. This study did not address the Internet as a source of information or marketing tool. However, the proliferation of NERR web sites will likely assist trip planners. The study found that locals are more likely to obtain trip information from printed information from sites, contact with sites, and the media. This indicates that, although this information is available and accessible, it is not reaching the tourists as well as it could.

This study has provided NERR educators and managers with information about visitors who are not affiliated with educational groups. By better understanding the characteristics of both tourists and local residents, managers and educators can better develop education and recreation programs and opportunities for both groups.

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INDIVIDUALS' INTERPRETATION OF CONSTRAINTS: A NEW PERSPECTIVE ON EXISTING THEORY

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Abstract: The travel decision-making process is influenced by a number of factors. One of the most important yet infrequently studied factors is "perceived constraints." Nearly a decade ago Crawford, Jackson and Godbey (1991) developed a framework to guide constraints research. Numerous authors have utilized this framework but results have suggested that individuals' perceptions of constraints differ based on study setting and method of data collection (e.g., questionnaire vs. interview). Hence, the purpose of this study was to use a multi-method approach (both quantitative and qualitative) to assess perceived constraints to visitation among a sample of Pennsylvania residents. Results indicated that individuals' are not consistent in their response to constraint questions and that their interpretation of a constraining item varies. The information presented in this paper will challenge traditional notions about constraints.

Why Study Constraints?

As consumers go through the decision-making process they are influenced by a number of factors. According to Norman (1995), one of the most important yet infrequently studied factors is "perceived constraints." Constraints, according to Jackson (1988), are "a subset of reasons for not engaging in a particular behavior." Further, he suggested that the value of leisure constraints research may be summarized into two main areas: improving the understanding of participation by classifying non-participants, describing their characteristics and documenting their constraints; and improving constraints measurement techniques. Constraints research can also provide benefits such as policy development and program planning to recreation practitioners (Searle & Jackson, 1985b). Norman (1995) concluded that incorporating perceived constraints into market segmentation/tourism research offers researchers and practitioners a better understanding of the complex nature of the travel decision process.

What is a Constraint?

Constraints are factors that inhibit or prohibit individuals' participation and enjoyment in leisure (Jackson, 1991). Norman (1995) defined travel constraints as constraints, inhibitors, obstacles, or restraining factors, perceived or real, that influence an individual's preference for and participation in a leisure activity. Dishman (1994) stated that perceived constraints might have a stronger influence on leisure activity participation than true constraints. Jackson (1988), in a survey of past research on leisure constraints, found that all researchers agreed in principle that constraints inhibit people's ability to participate in leisure activities. However, individuals do overcome and cope with constraints when participating in leisure activities (Mannell & Kleiber, 1997). In fact, some researchers believe that leisure participation is dependent not on the absence of constraints but on negotiation through them (Jackson, Crawford, & Godbey, 1993).

Constraints and Travel

Constraints are important factors in the travel decision making process (Tian, Crompton, & Witt, 1996; Um & Crompton, 1992). McIntosh and Goeldner (1990) listed constraints to travel as cost, lack of time, health limitations, family stage, lack of interest, fear and safety. If the motivation to travel is sufficiently strong, they argued, any of the above constraints may be overcome and travel will take place. However, the perception of or actual travel constraints will affect the destination selection process (McIntosh & Goeldner, 1990). Um and Crompton (1992), in their study of perceived inhibitors and facilitators in pleasure travel destination decisions, indicated that travel decision making is constraints driven rather than benefits driven. Norman (1995), in his research of perceived constraints as a basis for travel market segmentation, identified groups of respondents that were considered relatively "high level constrained" but continued to participate at an unconstrained level. Similarly, interview respondents in Kay and Jackson's (1991) study reported that perceived constraints did not reduce their level of participation.

The Hierarchical Constraint Model

In 1991 Crawford et al. proposed that individuals negotiate their way through three types of constraints (i.e., structural, intrapersonal and interpersonal). These constraints are hierarchical in nature, with intrapersonal constraints (e.g., stress, depression, anxiety, perceived self-skill) being the first and most difficult level of constraints to negotiate. At the second level, represented by interpersonal constraints (e.g., constraints resulting from interrelationships such as finding a suitable activity partner), constraints intercede between preference and participation in leisure activities. If this type of constraint is overcome, structural constraints (e.g., family life-cycle stage, family financial resources, season, climate, work scheduling, availability of opportunity) begin to be encountered. This model is hierarchical in terms of the order in which constraints are encountered, but also with respect to level of importance.

Empirical verification of the hierarchical constraints model by Crawford et al. (1991) is lacking, however (Alexandris & Carroll, 1997). Hawkins, Peng, Hsieh and Eklund (1999) conducted a replication and extension of their work and verified that the constraint categories can be replicated and extended with subtle distinctions. Six years earlier, Raymore, Godbey, Crawford and von Eye (1993) documented that the three categories of constraints did exist when studied with an adolescent population.

Study Objectives

Numerous authors (see Backman & Wright, 1990; Dunn, 1990; Jackson, 1993; Kay & Jackson, 1991; Scott & Jackson, 1991; Searle & Jackson, 1985a, 1985b) have utilized the framework presented by Crawford et al. (1991) but results have suggested that individuals' perceptions of constraints differ based on study setting and method of data collection (e.g., questionnaire vs. interview). Hence, the purpose of this study was to use a multi-method approach, quantitative and qualitative, to assess perceived constraints to visitation among a sample of residents of southwestern Pennsylvania.

Methodology

The data for this study came from a much larger study focused on awareness of area tourist attractions, attitudes towards tourism, information seeking and travel behavior regarding area sites and attractions, and constraints to visitation. In order to address the issue of perceived constraints, individuals were asked to indicate to what extent they agreed that the following constrained their visitation to area sites and attractions: lack of interest, lack of information, being physically unable, overcrowding at area sites and attractions, lack of things for kids to do, lack

of time, cost, lack of companion, lack of transportation, or the fact that they had visited before.

A total of 1,844 phone interviews were completed with residents of southwestern Pennsylvania. Telephone interviews were conducted between 4pm and 9pm on weekdays, and between 10am and 9pm on weekends. Upon completion of the phone interview/survey individuals were invited to participate in a follow-up mail-back survey seeking more detailed information about their perceptions of southwestern Pennsylvania and the factors influencing their visitation patterns within the area. A total of 1,378 individuals (75%) agreed to complete the follow-up survey. Six hundred sixteen completed follow-up surveys were received for a final response rate of approximately 45%.

On both the surveys (phone and mail-back), respondents were asked to indicate to what extent they agreed with the 10 constraint items. On the phone survey they did this using a 5-point Likert type scale ranging from 1 = strongly disagree to 5 = strongly agree. The response format on the mail-back survey was modified to 1= agree and 2=disagree. If respondents agreed that an item was constraining they were asked to explain why. On the phone survey, the constraint items were randomly listed to limit the influence of placement bias.

Results

The constraint items respondents most strongly agreed with were: "Not enough time," "Too expensive" and "Not enough information" (Table 1). It is worth noting, however, that respondents did not perceive any of the items to be highly constraining. The mean scores on the 10 constraint items ranged from 1.51 (disagree) to 2.98 (neutral) (Table 1).

Table 1. Response to the constraint items: The phone survey

CONSTRAINTS	Mean	(S.D.)
Not enough time	2.98	(1.51)
Too expensive	2.54	(1.28)
Not enough information	2.52	(1.43)
Visited them before	2.17	(1.29)
Overcrowded	2.15	(1.24)
Not enough for children to do	2.00	(1.08)
No people to go with	1.96	(1.33)
Not interested	1.76	(1.14)
Physically unable	1.53	(1.11)
No transportation	1.51	(1.04)

Note: 5 point Likert Scale: 1= strongly disagree and 5 = strongly agree

In the follow-up mail survey, participants were again asked to indicate their level of agreement with the 10 constraint items. If they agreed that an item was constraining they were asked to indicate why. Little more than two-thirds

(39%) of the respondents agreed they did not have "time" to visit area sites and attractions. And, almost one-fourth were constrained by "not enough information" (Table 2).

Table 2. Response to the constraint items: The follow-up survey

CONSTRAINTS	Agree	Disagree
Not enough time	38.70%	61.30%
Not enough information	24.90%	75.10%
Too expensive	13.30%	86.70%
No people to go with	11.00%	89.00%
Physically unable	7.60%	92.40%
Not interested	5.10%	94.90%
Visited them before	4.90%	95.10%
No transportation	4.80%	95.20%
Overcrowded	3.80%	96.20%
Not enough for children to do	3.70%	96.30%

Note: This was a dichotomous variable in the mail survey.

In order to compare the results of the phone and mail surveys, responses to the strongly agree (5) and agree (4) categories on the phone survey were combined. This allowed the researchers to determine whether the percentage of respondents who agreed that an item was constraining was consistent across methods (i.e., phone survey vs. mail-back survey).

As noted in Table 3 there were differences in response to the constraint items depending on method. The largest

difference was with the constraint item, "overcrowded." Only 3.8% of the respondents to the mail-back survey agreed that it is overcrowded in area sites and attractions. Yet, more than 20% of the respondents indicated that overcrowding was a constraint when asked the same question during the phone survey. Additionally, individuals were more inclined to agree that an item was constraining when asked about it during the phone survey.

Table3. Differences in response to the 10 constraint items by percent of respondents who agreed that the constraint existed

	Mail-back	Phone*
Not enough time	38.7%	48.2%
Not enough information	24.9%	35.0%
Too expensive	13.3%	29.9%
No people to go with	11.1%	18.3%
Physically unable	7.6%	10.7%
Not interested	5.1%	11.9%
Visited them before	4.9%	20.6%
No transportation	4.8%	8.6%
Overcrowded	3.8%	20.8%
Not enough for children to do	3.7%	9.8%

**In order to compare the percentage of respondents who agreed with the constraint item, the "strongly agree" and "agree" categories were combined to create an overall "agree" category.*

We also wanted to determine how individuals interpreted the constraint items. Thus, a content analysis of the open-ended responses to the top three constraint items (i.e., not enough time, not enough information, too expensive) was conducted. This was done with the responses to the constraint items in the mail survey, only. Several themes emerged. For example, in terms of the constraint item, "not

enough time," individuals interpreted this to mean work or family responsibilities as well as a substitution of activities. With respect to the constraint item, "too expensive," the open-ended responses were informative as well. Respondents interpreted expensive to mean value for money and reasonableness of charges.

Table 4. Qualitative responses to top three open-ended constraint questions in the mail-back survey

<u>Constraint Items</u>		
Not enough time	Not enough information	Too expensive
Work	I have never received any information	Entertainment fees are too expensive
Have more important things to do	I did not go get the information	Do not have enough money
Business travel	Needs to be displayed at more locations	Charges are not good value for money (unreasonable charges)
Public transportation takes time	Not advertised enough	It is expensive for a family
Family bonding	I do not know where to go	
Too old to get around		

Discussion and Implications

One important finding in this study is that people are not consistent in their response to questions regarding constraints. The fact that level of agreement with every constraint item went down when asked about it again on the mail-back survey is intriguing. Does this finding suggest that method influences response? Or, could this finding be a function of the environment in which the person was operating when responding to the surveys. For example, when on the phone the individual may have been less relaxed and as such wanted to get through the survey as quickly as possible. In addition, could this finding suggest that perception of constraints is situational? If so, researchers must begin to conduct longitudinal studies in an effort to validate our knowledge of constraints.

These study results also suggested that people do not interpret constraint questions or items similarly. For example, time to one person can mean "work time" while for another it may mean "time for travel," suggesting that quantitative scales may not be accurately assessing what is a constraint to an individual. This is problematic if program policy, marketing or program planning is being predicated on such findings.

The fact that constraints do not appear to be an overwhelming issue in this study leads to several questions. First, didn't we identify factors that were truly constraining individuals from visiting area sites and attractions? Second, have people negotiated through some of the constraints and as such do not deem them to be an issue? Or are people simply not constrained? This study focused on visitation behavior that has not been studied in any depth by travel and tourism researchers. Hence, answers to the previous questions will not be available until further research is conducted.

We also found that the most constraining factors are structural in nature. Intra- and inter-personal constraints were the least constraining. Is this true in all tourism settings? When individuals recognize a need for travel have they already negotiated through the constraints of not having the skills to travel or someone with whom they can

travel, for example? Is this negotiation based on past experience?

In summary, researchers need to carefully interpret individuals' responses to questions about constraints. To interpret "time" as something that is uncontrollable, for example, may be an invalid inference. The results of the present study suggest that researchers need to validate findings through repeating studies with similar populations; build in checks (e.g., follow-up phone calls) to the data; conduct focus groups or some other type of interview to determine whether there are constraints to travel previously not identified; and, if constraints are not an issue in the context of travel, to document if and how people have negotiated through constraints.

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CULTURE, HERITAGE AND TOURISM DESTINATION CHOICES

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Abstract: An important question often asked in trying to develop information for marketing activities is whether it is necessary to develop separate programs for the customers, clients, or visitors you are involved with. In other words, are there any differences that we should be aware of? This is particularly true in the area of tourism where we observe all types of marketing approaches, some of which seem to suggest homogeneity, while others show a sensitivity to diversity.

In the 12 years that the Pleasure Travel Markets to North America surveys have been in place, this question has become a critical one for action. A substantive way that these data have been used to examine travelers has been to separate out the tourist groups by destination (for example U.S. and Canada bound groups), and then describe and compare them. This paper extends that analysis and examines what happens in comparing destination based travelers from the United Kingdom that have an interest in culture and heritage based opportunities.

Factor analysis revealed that three categories of cultural and heritage attributes are important considerations in the choice of the US and Canada as destinations, by UK travelers:

Historic and natural heritage attractions (natural ecological sites, and cultural and historic sites); experiencing cultural lifestyles (meeting people of different ethnicities, trying new foods, and experiencing different lifestyles); and learning new/exotic things about the destination (educational component). The implications of these results are presented.

Introduction

The concepts of heritage and cultural tourist attractions as motivation factors for travel have been the focus of a number of research studies (World Tourism Organization, 1986; Swarbrooke, 1994; Tighe, 1986; Makens, 1987; Formica and Uysal, 1998). Heritage tourism attractions encompass tourist assets of historic significance such as

archaeological, military, or religious sites, monuments, buildings and cradles of civilizations (Tuly, 1997; Stevens, 1989; Vanhove, 1984). These may have played important roles in creating the identity of the destination (Prentice, 1993; Fowler, 1992), by defining its perennial and unique characteristics. On the subject of cultural tourism, a society's culture may be described as the way of life that has largely been passed down to the present generation from the past (Fragola, 1986). The cultural tourism attractions of a destination would therefore refer to the less tangible elements of the lifestyles of the people, such as values, customs, music, language, traditional folklore, artifacts, gastronomy and pageantry that the people use to express their world view (Sharpley, 1994). The institutions that serve as custodians of the unique cultural practices and lifestyles of the area, such as museums and political or religious organs would also form a part of the cultural attractions of a destination (Evans and Leslie, 1995). These lifestyle characteristics which tend to arouse the curiosity of strangers to the area, constitute its cultural attractions (Hall and Zeppel, 1990; Formica and Uysal, 1998).

Cultural and Heritage Tourism Today: Culture and heritage are major 'pull' factors in international tourism (Cossons, 1989), attracting tourists to cultural and heritage sites and events. These aspects of tourism have seen an increase in demand by tourists in the last few decades (Hitchcock et al., 1997). Some of the possible explanations for the continued growth of heritage and cultural tourism include the higher levels of education of the general public; media representations (especially on television) of worldwide heritage and cultural themes such as monuments, lifestyles and special events; the status-symbol value of heritage tourism; and the growing desire of tourists to make their holiday experience also a learning experience (Swarbrooke, 1994).

Consequently, the late 1980's and the 1990's have seen a shift in tourism tastes from a more materialistic market-driven mass tourism toward a quest for tourism products of an experiential nature (Swarbrooke, 1994). The attraction of heritage objects and 'exotic' cultural experiences have tended to play a major role in satisfying some of these changing tourism tastes.

Beside the educational and entertainment value that cultural and heritage attractions provide to visitors, they are also often valued by destinations as less finite economic resources. In some economically depressed areas, cultural entertainment, archaeological attractions, and historic buildings have been used in development schemes aimed at regenerating run down neighborhoods (Cohen, 1991; Lanfant, 1995; Worden, 1996). Rural traditions, cultures and gastronomy have become tourist attractions for urban dwellers trying to escape momentarily the tumultuous lifestyle of the cities.

There has been criticism that in these roles, heritage and cultural attractions are sometimes misused to validate myths and articulate 'masculinized' notions of place and identity that are male and elite-dominated versions of past and present 'pseudo-reality', but which bear little

resemblance to fact (Ranger, 1989; Kinnaird and Hall, 1994; Worden, 1996). However, another significant development in modern heritage and cultural tourism is the growth of interest in the heritage of 'the Common Man', in addition to that attributed to Kings and Queens (Swarbrooke, 1994).

Research Problem

The long tradition in Europe of interest in foreign cultures and historic attractions has been evident among UK travelers to the North American continent as well. While UK visitors to the southern and western parts of the U.S. were more interested in personally active pursuits like beach and warm weather activities, amusement/theme parks, shopping, access to large modern cities, nightlife and entertainment; it was the desire for educational experiences connected with cultural, heritage and natural experiences that were the major attractions to those visiting the central parts of the country (PTAMS UK 1989). Historical sites, native peoples, the great outdoors and wildlife appeared to be the principal attractions for these latter visitors to the U.S.

The interest of some of these visitors in the cultural and heritage aspects of the attractions of the continent therefore make an examination of these factors of the market a necessity.

Objectives of the Study: The principal objective of this study was to determine the importance of cultural and heritage attractions and activities in the trips of UK visitors to Canada and the U.S. The U.K. visitors to the two destinations would be compared to determine the differences and similarities that may exist on the cultural and heritage dimensions of tourism between them. The results of the study could be helpful in planning complementary and/or competitive marketing strategies for cultural and heritage attractions and activities in Canada and the U.S.

Methodology

The PTAMS Data: Since 1986, the PTAMS data have been gathered on tourism flows from important international travel markets to North America, and most recently, this has been done by Coopers & Lybrand Consulting, as part of a research program sponsored by the governments of Canada, the United States and Mexico. The visitors to the two destinations was statistically significant.

part of the data set that had information on the destination choice factors and trip activities for the most recent trip by UK visitors to either the United States or Canada was examined.

Factor analysis was performed on a motivational scale which contained variables or destination attributes that may have been important influences on respondents in planning and selecting the destination of their most recent long-haul trip. Factors which suggested preference for cultural/heritage activities during the most recent long-haul trip of respondents were extracted.

Once the cultural and heritage-oriented factors were identified, t-tests were done on their constituent variables in order to find out the extent to which their means differed between UK visitors to Canada and the U.S. T-tests were also done on a number of other salient variables, including demographics, length of stay, important sources of pre-trip information, expenditures and main purpose of the trip. The variables which showed significant differences between UK visitors to the two destinations were then cross-tabulated with cultural and heritage variables to determine the importance of various cultural and heritage variables in different categories of demographic and other important variables. For example, since the variables representing both 'age categories' and the cultural motivation of 'experiencing a simpler lifestyle' were significantly different among UK visitors to Canada and the U.S., a cross-tabulation of the two variables could shed some light on whether the difference in the mean age of the two groups of visitors was a factor in the disparity between their preference for, or aversion to 'experiencing a simpler lifestyle'.

Analysis of the Study

Characteristics of U.K. Cultural/Heritage Visitors to the U.S. and Canada: Among U.K. cultural/heritage visitors to the U.S., pleasure and vacation were found to be the principal motivations for the trip (Table 1). The next most important reason for their trip was to visit friends and relatives.

With U.K. cultural/heritage visitors to Canada, the most important purpose for the trip was to visit friends and relatives, followed by pleasure and vacation. A chi-square test indicates that the difference in main purpose for the trip between the cultural/heritage

Table 1.
Purpose of Trip Among Cultural/Heritage U.K.
Visitors to Canada and the U.S.

	Pleasure or Vacation Travel purpose	Visiting Friends and Relatives
U.S. Cultural/ Heritage	61.9%	22.0%
Canada Cultural/ Heritage	39.2%	51.4%

Source: PTAMS, U.K. (1996)

Canada: N=181

U.S.: N=236

Chi-Square Significance for both: .000

Comparing the results in Table 1 to the trend data in Figure 1, one discovers that the percentage of U.K. visitors to the U.S. whose main purpose for the trip was vacation was high throughout the decade studied, in spite of some fluctuations during the period.

The trend data presented in Figure 1 also suggests an inverse relationship between vacations as the main purpose

of trips and the amount of air travel undertaken within the U.S. destination. It appears that when the proportion of vacations grows as compared to other purposes of trips, then the amount of air travels within the destination drops. A similar relationship occurs between package tours and business as the main purpose of the trip. Again, as business trips increase, the package tour trip-type declines.

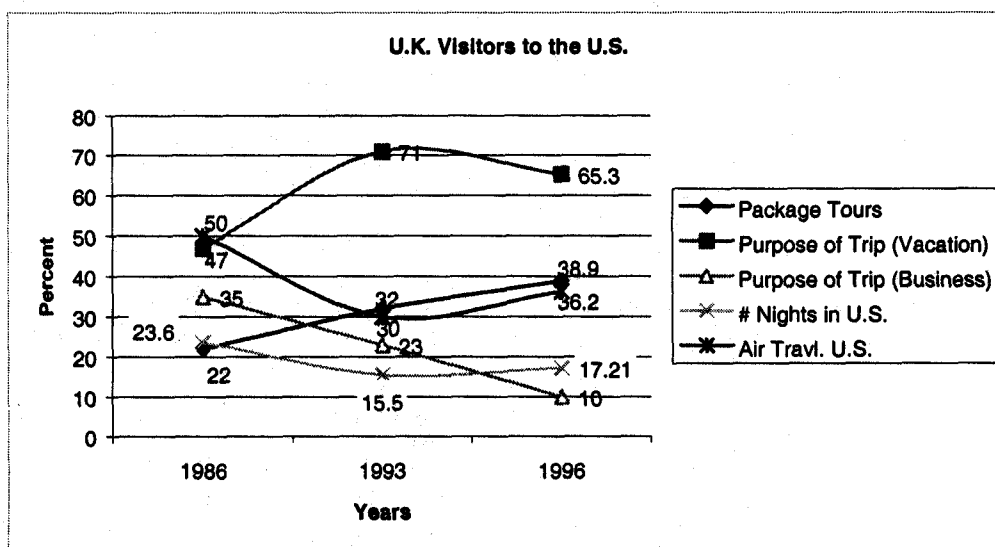


Figure 1. Trends in the U.K. Tourism Market to the U.S.

PTAMS U.K. (1996)

Source: United States Travel and Tourism Administration, (1993) and

Differences in Cultural and Heritage Activity Participation Among U.K. Visitors to North America

According to the "In-Flight Survey" data (1993), 'Visiting historical places' was one of the more popular activities for U.K. visitors to the U.S. in 1993, with 35% of visitors participating. By 1996, 42.9% were participating in this activity (Table 2). Seven of the activities identified through

factor analysis as being associated with cultural and heritage activities had significantly different participation levels among U.K. visitors to Canada and the U.S. (in bold in Table 2).

Participation in Cultural Activities: Eight activities were considered to represent cultural activities. They were: Sampling local foods, getting to know local people, interest in local crafts and handiwork, seeing or experiencing

people from a number of different ethnic backgrounds or nationalities such as Spanish and French-speaking North Americans, seeing or experiencing unique or different native groups such as Native Americans, enjoying ethnic culture and events such as music and neighborhoods, visiting museums and galleries, and experiencing the arts and cultural manifestations like live theatre, ballet and opera.

Since the composite cultural activity variable was a combination of 8 of the original variables on the activity scale, participation in three cultural activities during a single trip was subjectively chosen as the threshold,

indicating a commitment to cultural activity. Considering visitor participation in three or more of the listed cultural activities, 71% of visitors to Canada and 56.5% of the visitors to the US were committed cultural tourists. This difference was statistically significant. Figure 2 illustrates the participation levels in the aggregate cultural activity variable among U.K. visitors to Canada and the U.S. It shows that, generally speaking, cultural tourists to Canada (those who participated in three or more cultural activities), participated in more cultural activities than cultural tourists who visited the U.S.

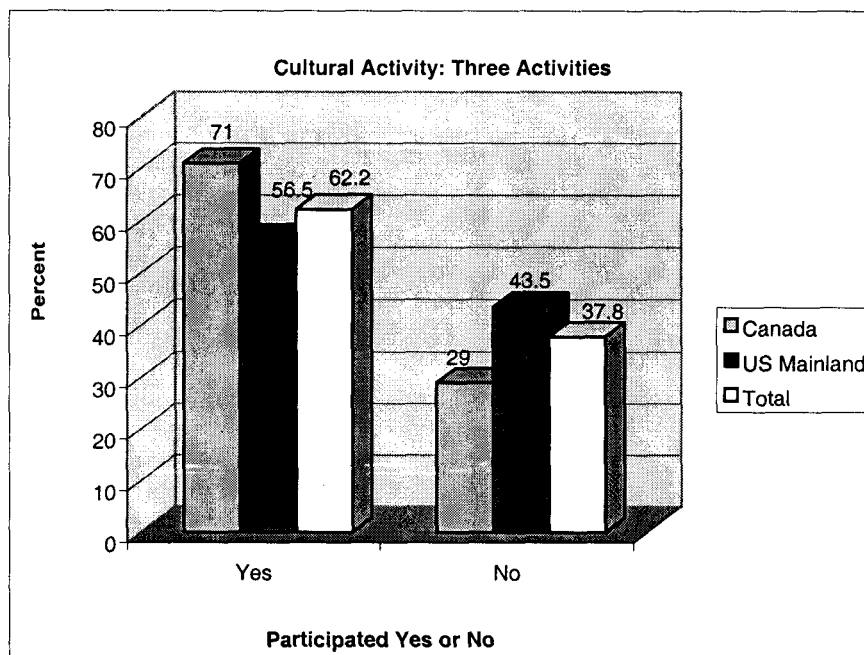
Table 2. Cultural and Heritage Activities in which U.K. visitors participated on their trip to Canada or the U.S.

Activities in which U.K. visitors participated on their trip	1996 U.S. Mainland % of Participation	1996 Canada % of Participation
Local crafts and handiwork ^{ab}	40.7	57.5
Getting to know local people ^{ab}	56.5	71.5
See or experience people from a number of different ethnic backgrounds or nationalities ^{ab}	34.3	40.7
Enjoying ethnic culture/events ^{ab}	33.4	41.6
Visiting museums/galleries ^{ab}	39.5	46.7
Attending local festivals/fairs/other special events ^{ac}	33.4	29.0
Visiting small towns and villages ^a	49.8	69.2
Visits to appreciate natural ecological sites ^a	38.9	45.3
Sampling local foods ^b	78.4	77.1
See or experience unique or different native groups ^b	16.4	19.6
Arts and cultural attractions ^b	25.2	22.4
Visiting places of historic interest ^c	42.9	47.2
Visiting places of military significance ^c	14.6	14.5
Visiting sites commemorating important people ^c	24.0	17.3
Visiting places with religious significance ^c	19.8	20.1
Visiting places of archaeological interest ^c	16.4	16.8
Visiting friends or relatives ^a	42.2	70.1

*Participation levels in activities in bold were significantly different among U.K. visitors to the U.S. and Canada. ^bCultural variables.

^cHeritage variables.

Figure 2. Trips Involving Participation in at Least Three Cultural Activities



Source: PTAMS, 1996. Significance: .002 (two-tail)

The cultural activity variables of interest in 'Local crafts and handiwork' and 'Getting to know local people' also had statistically different participation levels between U.K. visitors to the U.S. and Canada. In each case, the U.K. visitors to Canada participated more in the activities, and the difference was significant.

Participation in Heritage Activities: The heritage activity factor extracted through factor analysis was made up of 6 component variables: Visiting places of historic interest, visiting places of military significance, visiting sites commemorating important people, visiting places with religious significance, visiting places of archaeological interest, and attending local festivals/fairs/other special events.

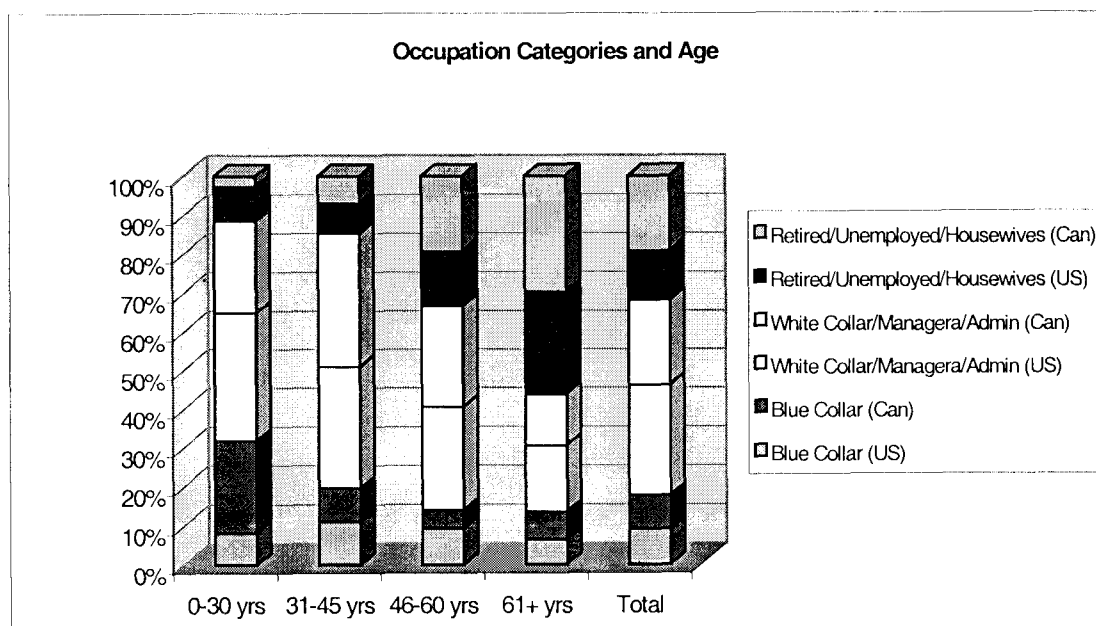
A comparison of the heritage activity factor between U.K. visitors to the U.S. and Canada did not show any significant differences in participation levels between the two destinations. Individual comparisons of the 6 component variables of the heritage factor revealed that the difference in participation levels for the heritage variable 'Attending local festivals/fairs/other special events' was significant. In this case, participation was higher among U.K. heritage tourists visiting the U.S.

Other Characteristics of Cultural/Heritage Tourists Visiting Canada and the U.S.: There were proportionally more singles among the group of U.K. visitors to the U.S. (which was younger, on average, than the group visiting Canada), and proportionally more divorced/separated/widowed visitors among those visiting Canada. These differences were statistically significant. The other marital categories were more similar between the two groups.

Among U.K. cultural/heritage tourists visiting Canada, 27.6% belonged to the category of retired/non-working housewife/unemployed, compared to 17.8% for those visiting the U.S.

There were no significant differences in gender distribution between the visitors to the two destinations. Even though it is not easy to make accurate comparisons based on different data sets using different methodologies, this shows a leveling up of the gender distribution of U.K. visitors to the U.S. between 1993 and 1996. The "In-Flight Survey" data (1993) statistics indicated that the average British visitor to the U.S. in 1992 was a male (62%).

Figure 3. Occupation Categories and Age Among Cultural/Heritage Tourists



Source: PTAMS, 1996 Significance: .000

Characteristics of U.K. Visitors Committed to Cultural and Heritage Activities

With the threshold at which visitors in this study were considered cultural and heritage tourists pegged at

participation in at least three of the activities that were identified through factor analysis as being associated with cultural/heritage tourism, the characteristics of the visitors so identified were compared with the average U.K. visitors to the U.S. or Canada, with the following results:

Table 3. Average U.K. Visitors Who Participated in Three or More Cultural or Heritage Activities

	<i>Average U.K. Visitor to Canada Who Participated in 3 or More Cultural/ Heritage Activities</i>	<i>Average U.K. Visitor to the U.S. Who Participated in 3 or More Cultural/ Heritage Activities</i>	<i>Average U.K. Visitor to the U.S.A. or Canada</i>
Age	51.34 (N=152)	42.79 (N=186)	45.70
Number of nights spent at destination	19.66 (N=152)	18.00 (N=178)	18.41
Total expenditure per traveler	£1163.11 (N=129)	£1165.49 (N=164)	£1104.73
Took a package tour	24.3% (N=181)	36.0% (N=236)	32.8% (N=543)
Party size	2.52 (N=180)	2.91 (N=236)	2.8 (N=416)
Have close friends or relatives living at the destination	74.0% (N=181)	57.7% (N=234)	*

Source: PTAMS, 1996

*Each destination was assessed separately in terms of availability of friends and relatives

U.K. cultural/heritage visitors to Canada (N=152) and the U.S. (N=178) spent a mean of slightly less than three weeks at their destinations. Table 3 shows other general differences that were statistically significant between the two groups. The average cultural/heritage U.K. tourist to Canada (N=152), was much older than his or her counterpart who visited the U.S (N=186).

Percentage-wise, Table 3 demonstrates that more than a third of the people visiting the U.S. (N=236) chose a tour package as their trip-type while slightly less than a quarter of those visiting Canada (N=181) did likewise.

Cultural/heritage travel groups to the U.S. (N=164) made significantly more total travel-party expenditures at the destination than those visiting Canada (N=129). This is not surprising since the travel-party size favored visitors to the U.S. The mean party size of 2.91 for U.K. cultural/heritage visitors to the U.S. (N=236) was significantly higher than the party size of 2.52 for those visiting Canada (N=180). This compares with the party size of 3.02 (N=329) for the

average U.K. travel group to the U.S., and 2.46 (N=213) for the average U.K. travel group to Canada (PTAMS U.K., 1996).

Table 3 also shows that the percentage of U.K. cultural/heritage visitors to the U.S. (N=234) who had friends or relatives at the destination was 57.7, compared with 74.0% for those who visited Canada (N=181). The difference was significant. The comparable percentages for average visitors to Canada and the U.S. were 74.8 (N=214) and 53.5 (N=327) respectively.

There was an indication in Table 3 that U.K. cultural/heritage tourists to both destinations spent more per trip, (approximately £1160, including airfare), than the average U.K. tourist visiting the same destinations (£1104.73).

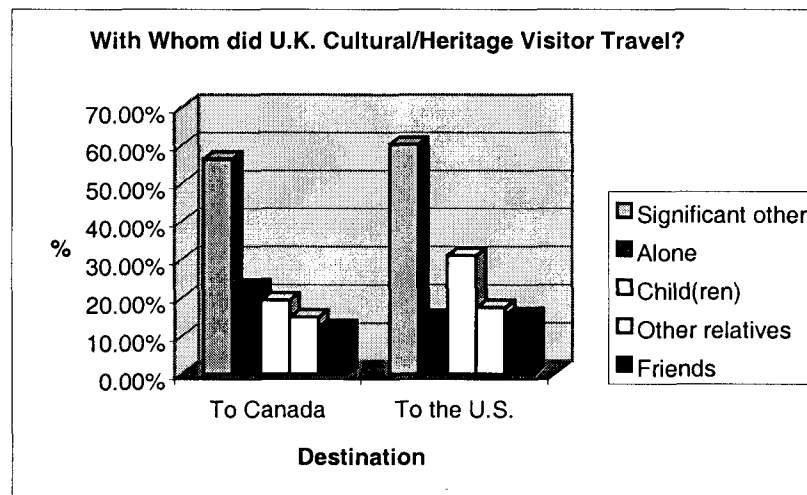


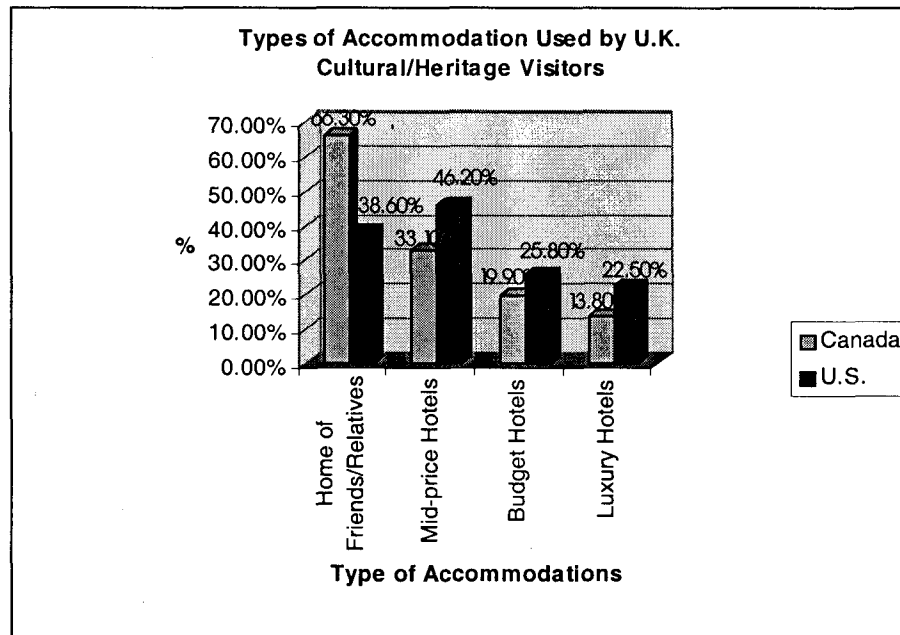
Figure 4. Travel Companions
Source: PTAMS, 1996
Canada: N= 181 U.S.: N= 236

More cultural/heritage U.K. visitors to Canada traveled alone (Figure 4) than those who visited the U.S., even though generally, travelers to both destinations were more likely to be accompanied. Combining travel companions who were family members or significant others, one discerns a higher family orientation among travel-parties who visited the U.S.

In Figure 5, nearly double the proportion of U.K. cultural/heritage visitors to Canada (two-thirds) spent some time in the homes of friends or relatives compared to the proportion of the visitors to the U.S. (a little over a third). Generally, the visitors to the U.S. tended to stay more often in commercial accommodations.

Figure

5.

Types of Accommodations Used

Source: PTAMS, 1996

Canada: N= 181 U.S.: N=236

Discussion

Characteristics of U.K. Cultural/Heritage Travelers to Canada and the U.S.: A major distinguishing characteristic between U.K. travelers to Canada and the U.S. is the difference in trip-types. More than half of U.K. cultural/heritage tourists go to Canada principally to visit friends and relatives, and 74% had close friends or relatives at the destination. This compares with For those visiting the U.S., 57.7% had close friends or relatives at the destination. The dominance of this trip-type at the Canadian destination appears to have had an impact on the pattern of use of commercial accommodations by U.K. cultural/heritage visitors to Canada, as two-thirds of them stayed in the homes of their friends and relatives for at least part of the time. They tended to use commercial accommodations less often.

Among cultural/heritage U.K. visitors to the U.S. on the contrary, 62% made the trip principally for pleasure and vacations. The fewer family and friends attachments that this group had at the destination is likely one of the contributing factors to their greater use of commercial accommodations and package tours.

Cultural and heritage activities such as festivals, fairs and special events need therefore to be planned in the U.S. to coincide with vacation periods in order to capture U.K. tourists. Marketing the cultural and heritage attractions of Canada to U.K. tourists, such as the opportunity to mix with the local people and to experience ethnic culture and events, should be easier than similar efforts by tourism

authorities in the U.S., because of the greater emphasis on visits to friends and relatives by U.K. visitors to Canada.

While the snapshots of three different years presented in Figure 1 may not be enough to establish a clear trend of U.K. tourist behavior in the U.S., the inverse relationship between air travel within the destination and vacations as the main purpose of the trip suggests that U.K. vacation tourists to the U.S. do not travel much by air once they arrive at their principal destination. Consequently, local airlines may have needed to target U.K. tourists with some incentives in order to benefit from that market.

Less than a quarter of the U.K. cultural/heritage visitors to Canada used package tours, compared with more than a third of those visiting the U.S. The Travel Industry Association of America (1997) study had established a pattern among U.S. adult travelers which suggested that, generally, older travelers tended to patronize package tours more than younger ones. The findings here suggest that U.K. travelers may differ from their U.S. counterparts, since the older U.K. visitors to Canada take fewer package tours than the younger visitors to the U.S. Part of the explanation for the lower appeal of package tours to U.K. visitors to Canada could be related to the fact that more of the visitors have close friends and relatives at the destination. These may serve as their local guides, making package tours less attractive.

Additionally, it has been said that the British market is a mature and sophisticated one in which travelers are more confident traveling independently and straying from the package offerings on the beaten path. Therefore, they are

said to be far less dependent on tour package travel than Asian markets for example (PTAMS, U.K. 1997). This could be part of the reason why Canada, which is quite familiar to U.K. tourists, could inspire a desire for independent exploration rather than managed package tours.

Besides, package tours to Canada are very structured and are short on flexibility, to the extent that only 6% of them include car rental, compared to 27% for the average long-haul destination (PTAMS, U.K. 1997). Consequently, the types of offerings of package tour products in Canada may help explain why its packages are not very attractive even among the most likely clients.

Business travel was also shown in Figure 1 to have an inverse relationship with the use of package tours. One would normally expect business visitors to be less likely to select package tours as a component of their trip. However, the decrease in the use of package tours in relation to an increase in business trips in this case could suggest a need for additional information about business travel for package tour operators. Is it still possible to capture the transaction of engaging in leisure activities during a business trip, or is the decline related to other changes in business travel behavior?

Developing innovative and flexible tour products that meet the needs of various types of travelers, including business travelers, may improve the tour package market in Canada for U.K. travelers. Such improvements could include greater emphasis on fly-drive packages, culture/history tours and special interest holidays. In the meantime, this is an area where the U.S. could siphon off potential visitors to Canada.

Differences in shopping expenses among cultural/heritage visitors to Canada and the U.S. were significant, with the visitors to the U.S. spending on average £150 more. The analysis showed that U.K. cultural/heritage tourists to the U.S. or Canada spend more than the average U.K. traveler to both destinations. Hence the cultural/heritage tourist is a premium client in terms of expenditure and should be targeted in marketing messages over and above the average tourist. Canada may need to include discount techniques and coupons in its advertisements targeted at cultural/heritage tourists in the U.K. in order to encourage them to spend more when they visit.

Given that the mean age of the visitors to Canada was higher than that of those going to the U.S., and that older visitors tended to value cultural/heritage attractions more than younger ones, the development of cultural/heritage programs in Canada will need to be sensitive to the needs and abilities of older travelers and retirees.

There was a significant difference in average travel-party size between U.K. cultural/heritage travelers to the U.S. (2.91, N=236), and to Canada (2.52, N=181). The travel-party size has implications for planning the capacity of tourists facilities at the destination, by managers. Additionally, the travel-party of U.K. cultural and heritage visitors to the U.S. appeared to be more family-oriented than their counterparts visiting Canada. The lower mean age of U.K. cultural/heritage visitors to the U.S. means that they were more likely to have children in their households, and their travel-parties were also more likely to be larger. U.S. tourism businesses should therefore plan

cultural/heritage programs for larger U.K. travel-groups and families. Visits to museums, festivals, fairs and special events as well as visits to small towns and villages and other family-friendly cultural/heritage activities should therefore be given close attention when creating programs for U.K. travel-parties visiting the U.S.

Business travel-parties were not an important component of the cultural and heritage visitors' activities at either destination.

Conclusion

While U.K. visitors to Canada and the U.S. have a lot in common, they also differ in substantial ways. Generally, vacations and pleasure-seeking are the main purposes of the visits of those who go to the U.S., while visits to friends and relatives tend to dominate as the principal reason for trips by U.K. visitors to Canada.

Participation in cultural and heritage activities is more widespread among the visitors to Canada, who happen to be an older group of visitors. The younger visitors to the U.S. take tours more often and they travel in larger family groups.

This analysis shows that, while the two destinations differ, they complement each other in many ways in the eyes of U.K. visitors, and could therefore constitute a single regional destination catering to a varied clientele, especially at the border regions. Competition among businesses in the two destinations for clients is inevitable, but joint targeted marketing could bring in more U.K. tourists who would travel between the two destinations to experience their varied attractions.

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A MEASUREMENT OF THE EXPERIENCE PREFERENCES OF CENTRAL APPALACHIAN MOUNTAIN BICYCLISTS

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Abstract: As the sport of mountain biking has grown in popularity, many localities have begun to develop facilities and promote cycling based tourism. Unfortunately, these promotional efforts often occur with little knowledge of the characteristics and preferences of mountain bikers. This study was an initial effort to collect descriptive data on the riding, travel and spending behavior of mountain bicyclists in the Central Appalachian region.

Introduction

As the sport of mountain biking has grown and developed over the past twenty years, many areas of the country have been identified by off-road cyclists as good places to ride and therefore desirable destinations for mountain biking vacations. These "good places" tend to be recognized by cyclists as desirable locations because of a variety of factors including public access, trail infrastructure, topography and scenery. Communities that have some of the factors (particularly the uncontrollable factors of topography and scenery) are recognizing that they may be able to improve mountain bike based tourism by improving the controllable factors such as public access and trail infrastructure. In addition, many of these suitable locations have begun to recognize the benefits of hosting cycling oriented special events (Bradley, 1997). The development of trails and facilities has also begun to be recognized as an important quality of life factor for local residents (NBPC, 1995). For these reasons, areas identified as desirable destinations have begun to develop trail systems, specialize their amenities and market themselves nationally to mountain bikers. As yet, much of this marketing and development is not supported by research on the participation habits and travel behavior of mountain bikers. Existing research on riding habits and travel

preferences has tended to be regionally oriented (Holmes & Schuett, 1995) or to focus on biking in specific management settings (Hollenhorst, Schuett, Olson & Chavez, 1993). As tourism marketing is typically approached on a community or regional basis, it is important to obtain assessments of the preferences of cyclists on a regional basis. This study focused on mountain bikers in the central Appalachian region.

Methods

An on-site survey was administered to 230 mountain bikers in southern West Virginia and southwestern Virginia. Respondents were approached at trailheads or bicycle shops at random intervals. The survey included items that measured the typical riding preferences of cyclists, their motives for riding and their criteria for trail selection. In addition, respondents were questioned about their vacation patterns, lodging preferences and mountain bike related spending. The analysis presented here is descriptive in nature.

Results

Usable surveys were obtained from 226 respondents. The sample consisted of 74% male and 24% female respondents. The mean age of respondents was 26.4 years with a range from 18 to 52 years of age. The sampled respondents had a mean of 5.1 years of experience in mountain biking ($SD = 4.20$), with a range of less than one year's experience to more than 20 years of experience. Also, 16% of the sample reported belonging to a cycling club or organization. Of the respondents, 67.7% reported that often or occasionally plan vacations or weekend trips for the purpose of mountain biking while 32.3% reported that they did not plan trips based on the sport.

Riding Preferences The ride time preferred by the largest number of respondents was one to two hours although a significant number (19.5%) stated a preference for rides of more than three hours duration (See Table 1). A majority of the respondents (48.7%) indicated preferences for single-track trails as their preferred riding venue. Unmaintained roads (ie logging roads etc) were the second choice, preferred by 38.1% of the respondents (See Table 1). A majority of respondents (71.2%) preferred to ride in social groups with one or two other riders, while 17.3% preferred to ride alone and 11.1% preferred to ride with three or more other riders (See Table 1). Preferences for riding frequency in non-vacation situations varied widely (See Table 1).

Table 1. Riding Preferences

Typical Riding Time	Frequency	Valid Pct
less than 1 hour	30	13.3
1 to 2 hours	99	44.0
2 to 3 hours	52	23.1
more than 3 hours	44	19.6
Total	225	100.0
Missing	1	
Trail Preference		
gravel roads	27	12.1
unmaintained (ie logging) roads	86	38.6
singletrack trails	110	49.3
Total	223	100.0
Missing	3	
Riding Group Preference		
alone	39	17.3
with 1 or 2 others	161	71.6
with 3 or more others	25	11.1
Total	225	100.0
Missing	1	
Riding Frequency		
1 or more times per week	83	37.2
2 to 3 times per month	59	26.5
once per month	31	13.9
less than once per month	50	22.4
Total	223	100.0
Missing	3	

Respondents were also asked to choose their primary criteria for selecting a trail from a battery of nine options. The primary motivation for trail selection was physical challenge (33.2%), followed by scenic beauty (27.4%) and convenience (17.4%). Trail characteristics that allowed

high-speed riding were the primary selection criteria for a notable minority (9.4%) of the riders (See Table 2). The availability of additional tourism related services was not a factor in the respondents' decision criteria for trails.

Table 2. Trail Selection Preferences

Selection Criteria	Frequency	Valid Pct
convenience	39	17.3
scenery	62	27.4
challenge	75	33.2
prior knowledge of trail	17	7.5
others services nearby	3	1.3
ability to ride fast/trail quality	10	4.4
ability to ride fast/ few users	11	4.9
ability to plan long complex rides	8	3.5
other	1	.4
Total	226	100.0

Travel and Spending Behavior

A majority of the respondents (67.7%) reported that they either often or occasionally planned vacations or weekend trips for the purpose of off-road biking. An additional 32.3% of the respondents reported taking a bike along on trips that were primarily for family or business purposes. The primary lodging preference is campgrounds, preferred by 48.2% of the sample. Hotels or motels were preferred by 20.3% of the respondents while 8% would stay with friends or family, 6.2% would prefer a resort setting, 5.8% prefer a bed & breakfast and 7% prefer an "other"

arrangement. The respondents reported spending a mean of \$39.00 per day while on cycling trips. The respondents reported a spending a mean of \$400.00 per year on mountain biking equipment, clothing and accessories. Most people who travel for pleasure tend to incorporate multiple activities into an outing. The mountain bikers in this survey also stated that they are likely to participate in additional activities on their trips. They report a preference to incorporate hiking and visits to scenic or historic areas into their mountain biking vacations. Swimming and eating out at restaurants were also popular (See Table 3).

Table 3. Additional Activities Preferred by Mountain Biking Travelers
(measured on a 5 point scale with "1" indicating lowest preference)

Activity	N	Mean	Std Dev
Hiking	225	3.928	1.099
Fishing	225	2.857	1.36
Golf	222	1.936	1.326
Canoe or Kayak	224	2.767	1.27
Visit Scenic Areas	225	4.093	.988
Visit Historic Areas	225	3.61	1.22
Swim	225	3.568	1.201
Rafting	225	3.106	1.368
Shopping	225	2.65	1.412
Restaurants	224	3.573	1.472

Conclusion

As more Appalachian communities attempt to lure mountain bikers as potential tourists, it becomes important to develop a better understanding of the unique preferences that these recreationists. While the findings of this study are largely descriptive in nature, it does provide a starting point in the development of a usable profile of mountain biker as a user of recreational facilities and tourism services. This profile may help to develop trail infrastructure and tourism amenities that are appropriate for the targeted market.

The respondents in this study are likely to engage in tourism behavior based on mountain biking. They prefer to ride in dyads or triads, choose trail systems based on challenge and scenery and incorporate visits to scenic and historic sites into their agenda. many prefer low cost accommodations such as campgrounds. Campgrounds may also be preferred because of close proximity to trails.

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EFFECT OF BALANCED INFORMATION ON ATTITUDES TOWARDS OPEN OCEAN AQUACULTURE DEVELOPMENT IN NEW ENGLAND

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Abstract: Assessing public support for natural resource management initiatives requires an understanding of how information will affect public attitudes. Using the development of marine aquaculture in New England as a case study, an experimental design was used to investigate the effects of balanced information on attitudes. The moderating effects of familiarity on attitudes were also examined. Results indicate that balanced information has a negative effect on attitudes, especially among individuals who are unsure of their level of familiarity with the issue.

Introduction

Global seafood demand is expected to grow by 70% in the next 35 years as the global population increases. At the same time, worldwide wild catches of many fish species are declining or have leveled off at maximum sustainable yield. For example, the near collapse in the stocks of cod, halibut, and a number of other species has caused the U.S. and Canadian governments to impose severe harvesting cutbacks in the Georges Bank fishing area of the northern Atlantic (Wirth & Luzar, 1999). As a result, the United States and Canada have placed increased priority on cultivating these species (U.S. Department of Agriculture, ERS 1995). To meet worldwide seafood demand, it is projected that aquaculture production will have to increase seven-fold, from 11 to 77 million metric tons by the year 2025 (U.S. Department of Agriculture, CSRS 1994).

The United States government is actively supporting the commercial development of open ocean aquaculture. The potential benefits of an open ocean aquaculture industry also include increased regional economic development, improved balance of trade, new employment opportunities, and the replenishment of wild stocks of commercially and recreationally important aquatic species (Royal, 1993). Opponents of aquaculture, in attempt to slow its development, have identified issues such as coastal water rights, jurisdictional conflicts, ecological disruption, processing plant pollution and conflicts with traditional users groups (Weeks, 1992). The scientific community is

on the fence with respect to the costs and benefits associated with open ocean aquaculture and the general public is unaware of the issues associated with the development of open ocean aquaculture. There is a need for research that documents what the public knows about open ocean aquaculture and what their attitudes towards aquaculture development are.

A planned program of social science research should allow for the integration of the social dimensions with information from the natural sciences. This research when available will allow the public to be more involved in activities associated with the management and development of marine resources. This heightens the need for managers to improve the way that they communicate with the public to obtain informed public involvement and acquire support for proposed plans and programs (Bright & Manfredo, 1997). Information campaigns are often prescribed for situations in which the public is uninformed on a topic. In these situations, managers set out to provide the public with the different sides of the issue without persuading them to either side. A balanced two-sided message provides arguments for two conflicting sides of an issue without refuting either side. However, the actual effect of these campaigns is largely unknown (Bright & Manfredo, 1997). To date, little research has examined the effect of balanced information about natural resource issues on public attitudes. No research has been completed with a focus on the effects of balanced information on attitudes towards open ocean aquaculture. Likewise, little research has been completed that looks at the potential moderating effects of familiarity on the impacts of information on attitudes (Manfredo & Bright, 1991).

Objectives

This study sought to determine what effect, if any, balanced information on potential advantages and disadvantages of aquaculture has on public attitudes towards aquaculture and how prior familiarity of aquaculture moderates the effect of information. Specifically, the following questions were considered:

- How familiar are the participants with aquaculture?
- What are their attitudes towards open ocean aquaculture development?
- Does the inclusion of balanced information in a survey effect participant response to attitude questions?
- Does the level of prior familiarity with the issue interact with the effect of information on attitudes?
- If balanced information does have an effect on attitudes, what is the nature of that effect?

Methodology

Sampling and Data Collection. An onsite survey of visitors to the 10th Annual Hampton Beach Seafood Festival was completed. Survey participants were asked to volunteer in the seafood survey as they passed by a booth space located

among restaurant vendors. Incentives for participation included a bottle of cold water, a seat in the shade, and the opportunity to taste test two seafood products; wild caught summer flounder and aquaculture summer flounder. The four-page questionnaire collected information on seafood consumption behaviors, self-reported knowledge of marine aquaculture and marine fisheries, and attitudes towards marine aquaculture development in New England.

Participants filled out the self-administered questionnaire while seated at the booth space. The first page provided a general description of the study being conducted and a definition of marine aquaculture. It also asked some general questions about the participants' seafood consumption patterns. The second page measured self-reported knowledge by asking the participants to indicate their familiarity with marine aquaculture and New England marine fisheries. Personal relevance on the importance of marine aquaculture and fisheries issues was also measured.

The third page included balanced information (on half of the surveys) and three attitudinal questions. The last page collected information on preferences for the two seafood samples and demographic information.

An experimental design was used to determine the effect of balanced information on attitudes. Balanced information was provided to half of the participants prior to the attitudinal measurements in the form of several statements on the potential advantages and disadvantages of aquaculture (Table 1). The statements were developed with experts in aquaculture management and were intended to provide equal weight by providing an equal number of statements on the advantages and disadvantages. The order of the statements was alternated so that half of the participants were presented with the advantages first and half were presented with the disadvantages first. A total of 232 surveys were completed, 113 with balanced information and 119 surveys without information.

Table 1: Balance Information

Open-ocean aquaculture is defined as the cultivation (or farming) of certain fish species in containment structures, in the open ocean, away from the protection of land. Some people believe we <u>should</u> develop marine aquaculture in New England for the following reasons: - improves the condition of the fisheries - provides jobs for displaced fishermen - provides economic development for coastal communities - helps meet the global demand for fish products - restores wild fish stocks - provides a safer, higher quality product - makes seafood products more affordable and readily available - preserves the cultural heritage of New England fishing communities - helps the United States compete in the global marketplace Some people believe we <u>should not</u> develop marine aquaculture in New England for the following reasons: - causes pollution from feed and fish wastes - causes marine mammal entanglements - spreads disease to wild fish stocks - threatens the genetic makeup of wild fish stocks, when cultivated fish escape into the wild - introduces non-native species into the ecosystem - requires lethal control of predatory animals who seek the easy prey of farmed fish - privatizes what should remain a free, open-access resource - is aesthetically undesirable - negatively impacts commercial fisherman and New England coastal communities
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Three attitude questions were asked to both the information and the no information group to test the effect of balanced information on attitudes; the three dimensions of attitudes were used to provide a more complete and reliable measure of attitudes. Participants were asked to indicate their responses to each of the following questions: (1) "Do you think developing marine aquaculture in New England is a GOOD or BAD idea?" (2) "Do you think developing marine aquaculture in New England is a BENEFICIAL or HARMFUL idea?" (3) "Do you think developing marine

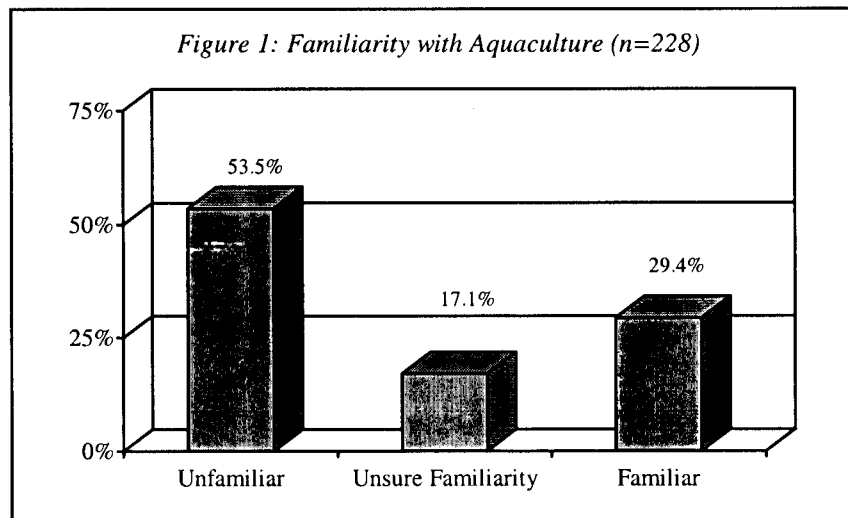
aquaculture in New England is a WISE or FOOLISH idea?" Responses were measured using five-step Likert scale ranging from "extremely bad" (or harmful or foolish), "moderately bad" (or harmful or foolish, "neither", "moderately good" (or beneficial or wise), and "extremely good" (or beneficial or wise).

As noted earlier, participants were asked their familiarity with marine aquaculture prior to answering the attitude questions. Familiarity was used as a proxy measure of self-

reported knowledge to determine whether prior information or knowledge had a moderating effect on the change in attitudes. Participants were asked to indicate their level of familiarity of aquaculture using a five-step Likert scale of “very unfamiliar”, “unfamiliar”, “unsure”, “familiar”, and “very familiar”. For analysis, the participants were divided into three groups representing three levels of familiarity that included “not familiar”, “unsure of familiarity”, and “familiar”. The data were analyzed using the Statistical Package for Social Scientists (SPSS). One-way analysis of variance was used to determine the effect of balanced information and prior familiarity of the issue on attitudes.

Results and Discussion

Familiarity was used to get an idea of how knowledgeable participants believed they were about marine aquaculture issues. Figure 1 provides the percentage of participants in each of the three categories of familiarity: unfamiliar, unsure of familiarity, and familiar. A majority of participants (53.6%) were unfamiliar with aquaculture, while 29.4% were familiar with aquaculture. The remaining participants, approximately seventeen percent, indicated that they were unsure of how familiar they were. The mean familiarity score was 2.63 and no significant difference in familiarity was found between the no information and information groups.



Participants showed favorable attitudes towards marine aquaculture in each of the three attitude questions (Figure 2). The results indicate that over 70% of participants had positive attitudes towards aquaculture development across all three dimensions (GOOD or BAD mean = 4.09, BENEFICIAL or HARMFUL mean = 3.98, WISE or FOOLISH mean = 4.05). Using the three attitude measures, a scale variable was calculated with a mean of 4.06 and an alpha number of 0.92. This variable was used in comparisons of means to determine the effect of information and familiarity on attitudes.

The relationship between familiarity and attitudes is shown in Table 2. The results indicate that familiarity does have an effect on attitudes, with participants who were familiar with aquaculture having more positive attitudes towards it than those who are unfamiliar or unsure of their familiarity.

The results of measurements of ANOVA indicate that the information group had less positive attitudes than the no

information groups (Table 3). A significant difference in attitudes between the information and no information group was found for all three of the attitude measurements, GOOD or BAD, BENEFICIAL or HARMFUL, and WISE or FOOLISH. Similarly, the scaled attitude variable also indicated that the balanced information provided in the questionnaire had a negative effect on attitudes.

The interactive effect of information and familiarity on attitudes was measured across the three levels of familiarity. Using univariate analysis of variance on the scaled attitude variable relative to familiarity and balanced information, the marginal means of attitude across the no information group and information group indicate that information had a negative effect on all participants (Figure 3). The negative effect on attitudes was found to be greatest among those participants who were unsure of their familiarity with aquaculture.

Figure 2: Attitude Measurements

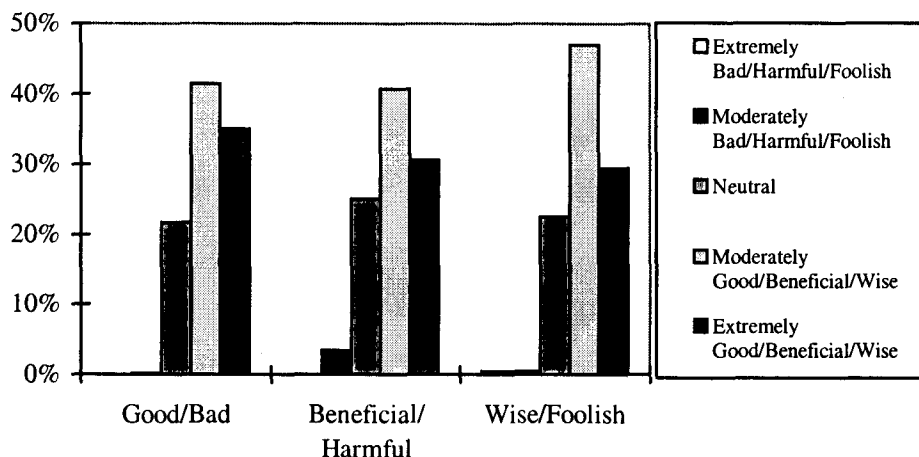


Table 2: Bivariate Relationship Between Familiarity and Attitudes

Level of Familiarity	Mean	Sig.
Not Familiar	3.8776	.000
Unsure Familiarity	3.8687	
Familiar	4.4570	

Table 3: The effect of balanced information on the attitudes towards marine aquaculture development in New England

Attitude	Group	Mean	F #	Sig.
good/bad	info	3.9537	7.279	.008
	no info	4.2526		
beneficial/harmful	info	3.8333	8.007	.005
	no info	4.1648		
wise/foolish	info	3.9439	4.074	.045
	no info	4.1613		
scaled variable	info	3.9333	6.877	.009
	no info	4.2051		

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	no info	4.2051		

Implications

As a new and emerging issue in New England, the public's attitudes towards marine aquaculture development are generally unknown. The results of this study show that participants had favorable attitudes towards aquaculture, suggesting that the public is supportive of aquaculture development in New England. These favorable attitudes were held almost despite the fact that they were unfamiliar with aquaculture. Although attitudes may be positive at this time, a lack of familiarity with aquaculture can have an impact public opinion in the future. The results suggest that persons provided with balanced information on the positive and negative aspects of open ocean aquaculture development were less likely to believe that the development of aquaculture was a good idea. This finding points to the importance of effective communication between open ocean aquaculture developers and the public. The attitudes towards aquaculture of participants who were unsure of their familiarity with aquaculture were the most effected by information. This really points to the importance of understanding what the public knows about aquaculture prior to developing information campaigns. Understanding the complex relationship between information, familiarity, and attitudes requires further study.

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Characteristics of Outdoor Recreationists

USE AND USERS OF THE APPALACHIAN TRAIL: A GEOGRAPHIC STUDY

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Abstract: The Appalachian National Scenic Trail (AT) is a public footpath that spans 2,160 miles of Appalachian Mountain ridgelines from Maine to Georgia. This paper describes the first comprehensive study of recreational use and users of the AT. The primary study method was a survey of visitors to the AT. The Trail was divided into 22 relatively homogeneous sections within four major geographic regions. Sampling was conducted in each of these regions during the summer and fall of 1999. This consisted of contacting randomly selected visitors and asking them to complete a mail-back questionnaire. Nearly 2000 questionnaires were completed and returned. The questionnaire addressed user characteristics, user preparedness, the quality of the visitor experience, attitudes toward alternative management practices and economic impact. This paper presents an initial analysis of the data, including visitor characteristics and perceived problems along the trail. These variables are compared across the four major geographic regions.

Introduction

The Appalachian National Scenic Trail (AT) is a public footpath that spans 2,160 miles of Appalachian Mountain ridgelines from Maine to Georgia. The AT is noted for its length and diverse character. It was designed, constructed, and marked in the 1920's and 1930's by volunteer hiking clubs joined together by the Appalachian Trail Conference. The 1968 National Trails System Act designated the AT as a linear national park. The goal of this designation is to

maintain the Trail environment as a place for people to enjoy the Appalachian Mountains and wildlands, while at the same time conserving the natural, scenic, historical, and cultural resources of this one-of-a-kind park. It is estimated that two-thirds of the Nation's population lives within a days drive of the AT.

This study represents the first comprehensive analysis of the use and users of the AT. The research involved querying respondents about a number of variables and issues. Some of these variables and issues included demographic information, satisfaction, perceived problems, motivations, and trip characteristics. This paper includes a preliminary analysis of selected data. It focuses on visitor characteristics and perceived problems along the AT. The data from the entire sample of respondents are presented followed by a geographic analysis by region.

Methods

The primary study method consisted of a survey of randomly selected users along the Appalachian Trail. Sampling took place in the summer and fall of 1999 (84% of the sample was obtained in 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, yielding 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 and consists of hikers/walkers, campers, picnickers, anglers, etc.

Geographic Division

In order to conduct a geographic study of the AT, the trail was divided into 22 relatively homogeneous sections within four major regions. This division was based on Appalachian Trail Conference jurisdictions as well as physical boundaries. The geographic division is as follows:

NEW ENGLAND

1. Baxter St. Park
2. 100 Mile Wilderness
3. Western Maine
4. NH-Mahoosics
5. NH-White Mtns.
6. NH-South
7. Vermont
8. Massachusetts
9. Connecticut

MID-ATLANTIC

10. New York
11. New Jersey
12. Pennsylvania
13. Maryland
14. Shenandoah

SOUTHWEST VA

15. Blue Ridge Parkway
16. Outing Club of VA Tech
17. Catawba
18. Mount Rogers

DEEP SOUTH

19. North of Smokies-Pisgah/
Cherokee NF
 20. Smoky Mtns.
 21. NC-Nantahala NF
 22. Georgia
-

Preliminary Findings

User Characteristics

The objective of this study is to help the Appalachian Trail's managing agencies (ATC, NPS, USFS, and trail maintaining clubs) to better understand the quality of visitors' experience and develop future management plans and education initiatives. Data on visitor characteristics plays a key role in this objective because it enables planners and managers to better understand the background of trail users.

Type of Visitor

AT users were divided into four basic types: day users (36.7%), overnight users (32.4%), section hikers (users hiking a substantial portion of the trail) (15.2%), and through hikers (users hiking the entire trail) (15.7%) (Table

1a). However, it should be noted that through hikers were intentionally oversampled in order to obtain a large enough sample for statistical purposes. The Southwest Virginia region reported predominantly day users at 77.6% (Table 1b); this is substantially higher than the other three regions.

Table 1a. Type of hiker

Type of Hiker	Number	Percent
Day user	640	36.7
Overnight	566	32.4
Through hiker	274	15.7
Section hiker	266	15.2
N=1879		

Table 1b. Type of hiker by region

Type of Hiker	New England	Mid-Atlantic	Southwest Virginia	Deep South	Thru Hikers	Total
Day user	30.1	35.8	77.6	42.3		36.7
Overnight	48.4	36.6	17.8	41.4		32.4
Through hiker					100	15.7
Section hiker	21.4	27.6	4.7	16.3		15.2

Number of Days and Miles on Trail

The mean number of days on trail reported by users other than thru hikers was 7.2 (Table 2a). The mean number of miles hiked was 71. By definition, the thru hiker

population reported higher means for both days on trail (148.4) and miles hiked (1862.6). Overall the sample exhibited more days and miles hiked on the trail in the northern regions than in the southern regions (Table 2b).

Table 2a. Number of days on trail and miles hiked

	Users (Non-Thru Hiker)		Thru Hikers	
	Days on Trail	Miles Hiked	Days on Trail	Miles Hiked
Mean	7.2	71.0	148.4	1862.6
Median	2	13	167	2160

N=1339, 1356; 305,297

Table 2b. Number of days on trail and miles hiked by region

	New England	Mid-Atlantic	Southwest Virginia	Deep South	Thru Hikers	Total
Days on Trail	8.6 (3)	11.4 (2)	2.1 (1)	4.6 (2)	148.4 (167)	33.4 (3)
Miles Hiked	88.1 (17)	122.6 (16)	16.9 (7)	38.9 (15)	1862.6 (2160)	392.9 (18)

expressed in means (median)

Group Size

Overall users tended to hike either alone or in small groups of two and three (Table 3a). However, the regional

analysis exhibits a stronger tendency among users in the Southwest Virginia and Deep South regions to hike in groups of two or more rather than alone (Table 3b).

Table 3a. Group size

Size of Group	Users (Non-Thru Hiker)		Thru Hikers	
	Number	Percent	Number	Percent
1	309	21.1	185	62.7
2	595	40.6	79	26.8
3	195	13.3	17	5.8
4	123	8.4	8	2.7
5	49	3.3	2	0.7
6	61	4.2	1	0.3
7	15	1.0	2	0.7
8	28	1.9	0	0.0
9	13	0.9	0	0.0
10	24	1.6	0	0.0
More than 10	55	3.7	1	0.3

N=1467;295

Table 3b. Group size by region

Size of Group	New England	Mid-Atlantic	Southwest Virginia	Deep South	Thru Hikers	Total
1	20.8	34.5	12.5	18.4	62.7	28.0
2	43.3	39.7	38.0	37.7	26.8	38.3
3	10.3	13.9	17.8	14.6	5.8	12.0
4	7.7	3.0	11.2	12.6	2.7	7.4
5	2.0	3.0	5.0	5.0	0.7	2.9
More than 5	15.9	6.0	15.6	11.7	1.4	11.4

Gender

The majority of users were male (69%) versus female (31%) (Table 4a). Males constituted a majority in all four geographic regions (Table 4b). The thru hiker population

displayed a larger difference in gender at 82.4% male and 17.6% female.

Table 4a. Gender

	Users (Non-Thru Hiker)		Thru Hikers	
	Number	Percent	Number	Percent
Female	452	31.0	51	17.6
Male	1005	69.0	239	82.4

N= 1457; 290

Table 4b. Gender by region

	New England	Mid-Atlantic	Southwest Virginia	Deep South	Thru Hikers	Total
Female	30.0	25.3	40.1	28.3	17.6	28.8
Male	70.0	74.7	59.9	71.7	82.4	71.2

Age

The average age of users was in the mid-to-upper thirties (mean = 37.9 years of age) (Table 5a). The majority of thru hikers (67%) were between 20 and 39 years-of-age.

Average age is relatively consistent across the regions and the thru hiker population (Table 5b).

Table 5a. Age

	Users (Non-Thru Hiker)		Thru Hikers	
	Number	Percent	Number	Percent
Under 20	94	6.4	9	3.1
20 to 39	658	45.1	195	67.0
40 to 59	584	40.0	77	26.5
60 and over	124	8.5	10	3.4

N= 1460; 291

Table 5b. Age by region

Region					
New England	Mid-Atlantic	Southwest Virginia	Deep South	Thru Hikers	Total
39.8	40.3	35.3	39.6	33.5	38.0

Education

The level of education reported by respondents ranged widely, but was concentrated in the higher educational

levels (Table 6a). This pattern was relatively consistent across geographic regions (Table 6b).

Table 6a. Level of education completed

	Users (Non-Thru Hiker)		Thru Hikers	
	Number	Percent	Number	Percent
8th grade or less	1	0.1	0	0.0
Some high school	29	2.0	2	0.7
High school graduate or GED	111	7.6	27	9.3
Business school, trade school, some college	280	19.2	61	21.0
College graduate	448	30.7	135	46.4
Some graduate school	160	11.0	28	9.6
Masters, doctoral, or professional degree	429	29.4	38	13.1

N= 1458; 291

Table 6b. Level of education by region

	New England	Mid-Atlantic	Southwest Virginia	Deep South	Thru Hikers	Total
8th grade or less	0.2	0.0	0.0	0.0	0.0	0.1
Some high school	2.8	1.9	1.0	1.3	0.7	1.8
High school graduate or GED	8.1	6.7	6.1	9.4	9.3	7.9
Business school, trade school, some College	17.4	19.1	24.0	17.9	21.0	19.5
College graduate	29.4	32.2	31.9	31.1	46.4	33.3
Come graduate school	9.6	10.5	15.3	9.4	9.6	10.7
Masters, doctoral, or professional degree	32.5	29.6	21.7	31.1	13.1	26.7

Income

Income levels ranged from less than \$20,000/year to more than \$100,000/year (Table 7a). Income levels appear to be

slightly lower in the southern regions of the trail and substantially lower for thru hikers (Table 7b).

Table 7a. Household income (before taxes)

	Users (Non-Thru Hiker)		Thru Hikers	
	Number	Percent	Number	Percent
less than \$20,000	240	17.8	97	36.1
\$20,000 to \$39,999	245	18.2	66	24.5
\$40,000 to \$59,999	272	20.2	36	13.4
\$60,000 to \$79,000	202	15.0	30	11.2
\$80,000 to \$99,000	156	11.6	10	3.7
\$100,000 or more	234	17.3	30	11.2

N= 1349; 269

Table 7b. Household income by region

	New England	Mid-Atlantic	Southwest Virginia	Deep South	Thru Hikers	Total
Less than \$20,000	15.3	14.4	27.0	16.2	36.1	20.8
\$20,000 to \$39,999	17.5	20.4	18.0	17.6	24.5	19.2
\$40,000 to \$59,999	20.7	18.8	19.0	21.8	13.4	19.0
\$60,000 to \$79,000	15.3	14.4	14.2	15.7	11.2	14.3
\$80,000 to \$99,000	11.3	14.0	9.7	12.0	3.7	10.3
\$100,000 or more	19.9	18.0	12.1	16.7	11.2	16.3

Ethnicity and Race

The vast majority of AT users were white (96.5%) and not Hispanic or Latino (98%) (Tables 8a & 8b). This is

generally consistent across the regions and the thru-hiker populations (Tables 8a-2 & 8b-2).

Table 8a. Ethnicity

	Users (Non-Thru Hiker)		Thru Hikers	
	Number	Percent	Number	Percent
Hispanic or Latino	17	2.0	6	3.9
Not Hispanic or Latino	816	98.0	146	96.1

N= 833; 152

Table 8a-2. Ethnicity by region

	New England	Mid-Atlantic	Southwest Virginia	Deep South	Thru Hikers	Total
Hispanic or Latino	1.3	5.3	0.6	2.3	3.9	2.3
Not Hispanic or Latino	98.7	94.7	99.4	97.7	96.1	97.7

Table 8b. Race

	Users (Non-Thru Hiker)		Thru Hikers	
	Number	Percent	Number	Percent
Black or African American	23	1.6	2	0.7
Asian American	17	1.2	4	1.4
White	1365	96.5	269	96.8
American Indian or Alaskan Native	7	0.5	2	0.7
Native Hawaiian or other Pacific Islander	3	0.2	1	0.4

N= 1415; 278

Table 8b-2. Race by region

	New England	Mid-Atlantic	Southwest Virginia	Deep South	Thru Hikers	Total
Black or African American	1.8	2.4	1.0	1.3	0.7	1.5
Asian American	1.4	1.2	0.7	1.3	1.4	1.2
White	96.3	95.7	97.4	96.4	96.8	96.5
American Indian or Alaskan Native	0.3	0.4	0.7	0.9	0.7	0.5
Native Hawaiian or other Pacific Islander	0.2	0.4	0.3	0.0	0.4	0.2

Perceived Problems along the AT

Respondents were queried concerning the extent to which they perceived issues as problems along the AT (Figure 1). Several issues were addressed in the questionnaire, including use impacts, trail maintenance, safety, and crowding. In all, respondents were asked about 44 conditions or issues that may exist along the AT. Respondents were asked to indicate whether each of these 44 issues was "not a problem" (0), a "small problem" (1), a "big problem" (2), or "don't know" (3).

To analyze these data a factor analysis was conducted. This is a data reduction technique that identifies relationships among multiple variables. Using this technique, we were able to identify six problem categories. They are identified below followed by a description of results:

- ***Crowding:*** This factor consisted of issues concerning groups being too large, congestion, groups encountered, and inconsiderate hikers. Overall, respondents rated crowding as a moderate problem. Crowding was perceived as more of a problem in the northern than the southern regions.
- ***Not enough facilities:*** This factor consisted of issues regarding not enough water or restrooms, too few shelters, and lack of public participation. Not enough facilities received a moderate rating from respondents. Across the regions, this issue was relatively consistent but reported slightly higher in the Mid-Atlantic and Deep South regions.
- ***Lack of information:*** This factor consisted of not enough information available to hikers, not enough information on how to prepare for a safe hike, and regulations not being publicized. Lack of information received a low rating overall. In the regional analysis this issue was more of a problem in the south than the north.
- ***External development:*** This factor consisted of questions concerning development that could be seen and traffic noise that could be heard from the trail. External development was rated as a moderate

problem overall. This issue was perceived as more of a problem by respondents in the Mid-Atlantic region than the others.

- ***Ecological impacts:*** This factor was comprised of issues concerning damage to soil and vegetation as well as trail erosion. Ecological impacts rated highest overall indicating it was a relatively big problem to respondents. Respondents in the northern regions perceived this as more of a problem than in the southern regions.
- ***Too much management:*** This factor consisted of too many rules and regulations and too many rangers/management on the trail. Too much management rated lowest overall. Respondents in the northern regions and the thru hiker population perceived this issue to be much more of a problem than those in the southern regions.

Overall, the extent to which each of these factors was perceived as a problem was relatively low. Among the factors, ecological impacts were rated as the biggest problem, whereas too much management was rated as the smallest problem.

Conclusion

This study represents the first reasonably comprehensive study of use and users of the entire AT. Study data begin to provide potentially important insights into the characteristics of the trail users, perceived trail management issues, and a variety of other variables and issues. Preliminary findings suggest that use and user characteristics may vary by geographic region of the trail. Further analysis will be conducted and may illuminate additional differences in other study variables. This information will be provided to trail managers in order to help them make more informed management decisions concerning the AT and its users.

A COMPARISON OF RECREATION CONFLICT FACTORS FOR DIFFERENT WATER-BASED RECREATION ACTIVITIES

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Abstract: Previous studies point out recreation conflict may be affected by recreation goals, resource specificity, activity style, mode of experience, lifestyle tolerance, norms, problems perceived, visitor values and conflict sensitivity. However, people engaging in single or multiple activities may have different patterns when considering recreation conflict. A study of personal watercraft users, motorboat users and landowners in the New York State's Great Lake area was conducted to compare the recreation conflict factors. Three different types of questionnaires with a total of 4634 surveys were sent out and received an overall response rate of 42%. Eight subgroups were deduced based on their recreation activities and questionnaires answered. The results revealed the eight groups are common in the structure but not in the value of the conflict factors. Study results also showed a series of asymmetrical conflicts in which landowners were interfered with by both personal watercraft users and motorboaters, motorboaters were affected by personal watercraft users but not landowners, and personal watercraft users were not affected by either one.

Introduction

The popularity of personal watercraft has stirred controversy both for and against their use in state and National Parks, as well as across many waterways and lakes of the United States. How you view personal watercraft use and operator behavior depends, in part, on whether you own and operate a personal watercraft or not. Both recreation conflict and compatibility have been reported between personal watercraft users, motorboaters, and landowners in a variety of circumstances. Some of the recreation conflicts arise from personal watercraft users interfering with the experience of motorboaters by speeding, jumping their boat wakes, or crossing their boating path. Reportedly personal watercraft users interfere with coastal landowners because of the noise of the personal watercraft, potential safety problems near other recreational users, and some privacy issues of landowners.

Jacob and Schreyer (1980) defined recreation conflict as "goal interference attributed to another's behavior" and proposed four major dimensions of recreation conflict factors, including activity style, resource specification,

mode of experience, and lifestyle tolerance. These dimensions of conflict factors were verified by several studies (Adelman et al., 1982; Watson et al., 1991; Ivy et al., 1992; Kajala, 1994; Watson et al., 1994; Gibbons et al., 1995; Ramthun, 1995; Vaske et al., 1995; Schuster, 1996). For example, Watson et al. (1994) used factor analysis to categorize recreation conflict factors and found that goal interference was affected by activity style, resource specificity, and mode of experience. In addition, Ivy et al. (1992) pointed out that individuals with lower tolerances will feel more conflict, and at the same tolerance level, canoeists will feel more conflict than motorboaters.

In addition to the four dimensions of conflict factors proposed by Jacob and Schreyer (1980), empirical studies found visitors norms (Ruddell and Gramann 1994), goal or motivations (Jackson 1982; Noe et al. 1981; Gibbons and Ruddell 1995), and conflict sensitivity (Ramthun 1995) also affect recreation conflict. Ruddell and Gramann (1994) suggested that the less tolerant a person's individual norm for noise levels, the more likely that violations of the social norm for radio volumes will be perceived as a source of interference. Jackson (1982) studied the conflict between skiers and snowmobilers and concluded that skiers were more natural environment oriented and snowmobilers were more escapism and socialization oriented. In addition, Ramthun (1995) proposed a model in which conflict factors contributed to an intermediate factor, sensitivity, and in turn caused the perceived interference.

Previous studies identified the potential conflict groups as specific activity participants, and did not mention that people engaging in single or multiple activities may have different patterns or different values for the factors when considering recreation conflict. For example, researchers pointed out interference between motorboating and nonmotorboating, but users with both experiences may have different interference levels from those with only one experience. Furthermore, users with both motorboating and nonmotorboating experiences may react differently when participating in motorboating and nonmotorboating activities. The purpose of this paper is a comparison of conflict factors across groups with different activity combinations.

Methods

New York's Great Lakes (NYGL) in this study included the U.S. side of St. Lawrence River, Lake Ontario, Niagara River, and Lake Erie. Compared to many inland bodies of water in New York State, NYGL has a larger water surface area and less public access overall. However, the potential recreation conflict problems usually do not happen in the middle of a lake, but in the coastal areas with public access, such as in bays, harbors, or near public beaches.

In order to get a sufficient sample size for each user and combination of users (e.g., landowners who own a motorboat), PWC users (n=1000) and motorboat users (n=3000) were selected systematically from the New York State watercraft registrations in the 10 coastal counties along the NYGL including: Jefferson, St. Lawrence,

Oswego, Wayne, Monroe, Niagara, Orleans, Erie, Chautauqua, and Cayuga counties. Landowners with coastal lands adjacent to NYGL were selected (n=634 and about 100 for each site) from the tax maps of six study sites including: Alexandria Bay, Sandy Pond, Sodus Bay, Olcott, Niagara River, and Hanford Bay. These six sites were selected because of their access to the Great Lakes and the significant use for boating, personal watercraft use, other water-based recreation activities, and proximity to private coastal property. By searching the tax maps, this study selected only those owners with residences (primary and secondary) adjacent to the NYGL but omitted those with vacant lands or only docks.

Three mail surveys with parallel questions were designed for personal watercraft owners (PWC), motorboat owners, and coastal landowners to measure the recreation conflict components and compatibility among users with various activity combinations. The term "jet ski" was used in all surveys instead of PWC because it was more commonly understood by the public. Each of the three mail surveys was designed from the research literature around nine reported dimensions of recreation conflict and were each measured by multiple questions. The surveys to users asked about their: recreation motives (19 questions), recreation activity style (11 questions), resource specificity for their recreation activity (10 questions), lifestyle tolerance (30 questions), mode of recreation experience (8 questions), norms for distance from recreational others (8 questions), problems from personal watercraft users and motorboaters (20 questions), sensitivity to recreation conflict (13 questions), and visitor values for recreation activities (13 questions). In addition, any actual recreation conflict perceived by the survey respondents was measured by an open-end question in which respondents were asked to describe the interference they had experienced while recreating in the NYGL during the past year.

An exploratory factor analysis was conducted on data using orthogonal varimax rotation to reduce the 132 items down to meaningful factors to describe the data set. The procedure to establish the factors were: (1) an eigenvalue of 1.0 was retained in factor analysis for each dimension, (2) the numbers of factors within each dimension across the 8 groups were checked to see the most common number of the factors, (3) factor numbers were set at the common number from the previous step and factor analysis run again, (4) factors within each dimension were interpreted based on loading and meaningful item combinations, and

(5) Cronbach's alpha of greater than 0.50 was required for it to be retained because as a "rule of thumb" any solution should account for at least 50 percent of the total variance. The statistical package for the social sciences (SPSS version 10.0 for windows) was used to conduct this analysis.

Study Results

A total of 4,641 surveys were sent out. After two follow up reminder mailings, an overall adjusted response rate of 42% was achieved (personal watercraft owners = 33%, motorboat owners = 41% and landowners = 63%). Respondents were asked to report their ownership of motorboats, PWC, and coastal lands adjacent to the NYGL. Because each type of survey has four possible ownership combinations, the three surveys produced a total 12 types of owner group combinations (Table 1). To reduce the number of groups, ANOVA with Least Significant Distance was conducted within each type of survey to combine the similar groups together based on the 132 questions in the survey. Motorboat owners with a PWC and land (M-pwc-l) and motorboat owners with a PWC (M-pwc) were grouped together because they only differed in 9 of the 132 items. In addition, PWC owners with a motorboat and land (PWC-m-l), PWC owners with a motorboat (PWC-m) and PWC owners with land (PWC-l) were combined into the same group because they had less than 15 items different of the 132 questions. Landowners with a motorboat and a PWC (L-m-pwc) were similar to landowners with PWC (L-pwc) because only 4 of the 132 items differed. Therefore, the 12 ownership groups were reduced to 8 ownership groups with similar responses (see Table 1).

Please note that the results from similar ownership groups in the three different surveys can not be added together since each survey was designed from the perspective of owning either a motorboat, PWC, or coastal land. Thus, the PWC-m-l group is different from the L-m-pwc group because the first group answered the PWC survey and the second group answered the Landowner survey. In an effort to make it clear which survey a ownership group completed, capital letters on the group abbreviation will denote the type of mail survey for those respondents. For example, PWC-m-l denotes a Personal WaterCraft survey respondent who also owns a motorboat and/or coastal land along NYGLs.

Table 1. Group ownership^a combinations based on results from NYGL mail survey respondents^b.

Original Ownership Group	Group Symbol	Group Combination	Group Symbol	Sample Size (n)
Motorboat Owner Survey				
Motorboater with pwc and land	M-pwc-l	Motorboater with pwc and/or land	M-pwc-l	49
Motorboater with pwc	M-pwc		M-pwc	
Motorboater with land	M-l		M-l	
Motorboater only	M	Motorboater only	M	694
PWC Owner Survey				
PWC with motorboat and land	PWC-m-l	PWC with motorboater and/or land	PWC-m-l	204
PWC with motorboat	PWC-m		PWC-m	
PWC with land	PWC-l		PWC-l	
PWC only	PWC	PWC only	PWC	82
Landowner Survey				
Landowner with motorboat and pwc	L-m-pwc	Landowner with pwc and/or motorboat	L-m-pwc	49
Landowner with pwc	L-pwc		L-pwc	
Landowner with motorboat	L-m		L-m	
Landowner only	L	Landowner only	L	76

^a Ownership groups include: Landowners = L; Personal Water Craft owners = PWC; Motorboat owners = M.

^b Capital letters denote the type of mail survey for those respondents.

Table 2. Recreation motives and average importance^a by responding ownership groups in the NYGL surveys.

Motives	Group							
	PWC Owner		Motorboat Owner			Landowner		
	PWC-l-m	PWC	M-pwc-l	M-l	M	L-m-pwc	L-m	L
Nature Enjoyment								
To see the scenic beauty; To be outdoors; To be in natural surroundings	3.6	3.5	3.8	3.7	3.6	4.3	4.3	4.2
Relax, Rest & Get Away								
For relaxation and rest; To experience peace and quiet; To get away from job stress; To get away from daily routines; To get away from others	3.0	3.0	3.4	3.2	3.2	3.7	3.6	3.3
Social Interaction								
To be with my family; To meet new people like myself; To be with people who have similar values; To be with friends	2.7	2.8	3.0	2.9	2.8	3.6	3.0	2.8
Excitement & Exercise								
For excitement; For exercise	2.6	3.0	1.6	1.6	1.6	2.8	2.1	2.1
Skill & Equipment								
To improve my boating skills; To teach my skills to others; To test my equipment	2.2	2.3	1.9	2.1	2.2	1.9	1.7	0.2

^a The number shown in the table is the mean value of importance for the motives from 0 = not important to 5 = very important.

Recreation Motivations of Users

In the factor analysis, two of the 19 motive questions were eliminated because of their low statistical reliability, and the remaining 17 questions were grouped into five factors including: Nature Enjoyment, Relax, Rest & Get Away, Social Interaction, Excitement & Exercise, and Skill & Equipment (Table 2). All ownership groups, especially landowners, reported that they enjoyed the NYGL's natural setting (3.5-4.3) and the chance to relax, rest & get away (3.0-3.7). Social Interaction was moderately important for all groups (2.7-3.6). Landowners liked to get their family together or make friends with their neighbors or visitors; PWC owners and motorboat owners liked to see others and be seen during their boating. Although Excitement & Exercise and Skill & Equipment were not important for all groups, PWC owners enjoyed the excitement more (3.0) and focused on their skill more (2.3) than the other groups. Landowners had low interest in Skill & Equipment (0.2), probably because they did not report owning a motorboat or PWC.

Activity Style

Activity style was measured by respondent reactions to 11 statements based on a scale from strongly disagree (-2) to neutral point (0) to strongly agree (2). Two of the 11 statements were dropped because of their low statistical reliability and the remaining 9 statements produced two factors, Self-identity and Value Sharing (Table 3). Landowners (0.6-1.0) somewhat identified themselves in Group Identity with other landowners. PWC owners without other ownerships (0.9) more identified themselves as PWC owners than those PWC owners with a motorboat or land (0.4). However, landowners without boats or PWC's (0.6) identified themselves as landowners less than those with a motorboat or a PWC (0.8-1.0). PWC owners disagree with Value Sharing (-0.3 ~ -0.2) with other PWC users; however, motorboat owners (0.3-0.4) and landowners (0.5-0.7) somewhat share their values with other motorboat owners and landowners respectively.

Comparing the two activity style factors within ownership groups, it was found that PWC owners identified well with

other PWC owners but reportedly didn't strongly share values with other PWC owners. On the other hand, landowners strongly identified with other landowners and they also reported that they shared common values with

other landowners. Motorboat owners identified with other motorboat owners and they also reported that they shared common values with other motorboat owners.

Table 3. Activity style dimension and average response ^a to statements by responding ownership groups in the NYGL surveys.

Activity Style	Group							
	PWC Owner PWC-m-l PWC		Motorboat Owner M-pwc-l M-l M			Landowner L-m-pwc L-m L		
Self-identity I am proud to be a xxx ^b . I often describe my self to others by saying, "I am a xxx." I am glad I chose to participate in xxx rather than another activity. I become irritated when I hear others criticize xxx. I talk up xxx to my friends as a great activity.	0.4	0.9	0.5	0.5	0.5	1.0	0.8	0.6
Value sharing The xxx image in the community represents me well. I find that my values and the values of other xxx are very similar. I find it is easy to identify my self with other xxx. I have a lot in common with other xxx on the coastal of NYGLs.	-0.3	-0.2	0.4	0.3	0.3	0.7	0.5	0.5

^a The number shown in the table is the mean value of agreement with the statement, from -2=strongly disagree to 2=strongly agree.

^b For the three different surveys, xxx means jet skiers, motorboaters, and riparian landowners to the related respondents.

Table 4. Resource specification and average response ^a to statements by responding ownership groups in the NYGL surveys.

Factor	Group							
	PWC Owner PWC-m-l PWC		Motorboat Owner M-pwc-l M-l M			Landowner L-m-pwc L-m L		
Best Place No other places can be compared with that area. Being there makes me more satisfied than visiting any other places. I would not substitute this place with any other place to go jet skiing.	0.3	0.0	0.4	0.5	0.1	0.8	0.7	0.5
Place Dependence The area means a lot to me. I identify strongly with the area. I feel attached to the area. Much of my life centers on this area. New York's Great Lakes is my favorite place in my time off. Being on New York's Great Lakes is very important to me. When I jet ski there I can really be myself. Being there is one of the most pleasant things I can think of.	1.0	0.7	0.9	1.1	0.7	1.3	1.3	1.1

^a The number shown in the table is the mean value of agreement with the statement, from -2=strongly disagree to 2=strongly agree.

Resource Specificity

Respondents were asked to evaluate how strongly they agreed or disagreed with 11 questions to measure their resource specificity. Analysis of the 11 resource specificity questions produced two factors, Best Place and Place Dependence (Table 4). Although most respondents did not strongly agree (0.0-0.8) that the NYGL was the best place for water-based recreation, landowners (0.5-0.8) more often agreed it was the best place compared to motorboat and PWC owners (0.0-0.5). PWC owners (0.0) and motorboat owners (0.1) probably realized that, due to their mobility, they had the option to use other areas to enjoy their recreational activities. The factor Place Dependence

indicated all owners were somewhat dependent on the NYGL area for their experiences (0.7-1.3), especially landowners (1.1-1.3). Generally, landowners depended more on the NYGL area because of their properties, whereas motorboat and PWC owners could more easily alternate their activities to other bodies of water.

Lifestyle Tolerance

Respondents were asked to evaluate their own group and the other two ownership groups to measure their lifestyle tolerance. One of the 10 questions was eliminated because of its low statistical reliability. The remaining 9 questions were grouped into one factor for each group evaluation

(Table 5). In the evaluation for PWC, all owners with PWC's evaluated PWC owners as somewhat good (0.2–0.4), but other landowners or motorboat owners without a PWC had negative evaluations for PWC owners (–0.5 ~ –0.2). This response pattern did not reoccur in the evaluations for motorboat owners and landowners, all users have relatively positive images for those two ownership groups. Comparing the values within each survey group, PWC owners thought they were similar to motorboat owners (0.3 vs. 0.3) but not too similar to landowners (0.3 vs. 0.5). All motorboat owners thought they were similar to landowners but not to PWC owners; however, landowners did not agree they were similar to the other two groups. Interestingly, PWC owners with land or a motorboat were

similar to both PWC owners and motorboat owners. For example, their evaluation for PWC owners was the same as PWC owners (0.3), but like motorboat owners they thought motorboaters were similar to landowners. The possible reason is many respondents in this PWC group had motorboats. Also landowners had the highest self-evaluation (1.0–1.2), while PWC owners were not so confident in their self-evaluation (0.3). These results suggest a series of asymmetric interferences among those three groups—both PWC owners and motorboat owners affected landowners, motorboat owners were affected by PWC owners but not much by landowners, and PWC owners were not affected by the other two groups.

Table 5. Lifestyle tolerance and average response ^a to paired word comparisons by responding ownership groups in the NYGL surveys.

Lifestyle Tolerance	Group							
	PWC Owner		Motorboat Owner			Landowner		
	PWC-m-l	PWC	M-pwc-l	M-l	M	L-m-pwc	L-m	L
Evaluation of jet skiers Respectful–Risky; Quiet–Noisy; Similar to me–Different from me; Polite–Impolite; Courteous–Discourteous; Friendly–Unfriendly; Responsible–Irresponsible; Good–Bad; Unthreatening–Threatening.	0.3	0.3	0.2	–0.3	–0.2	0.4	–0.5	–0.2
Evaluation of motorboaters Respectful–Risky; Quiet–Noisy; Similar to me–Different from me; Polite–Impolite; Courteous–Discourteous; Friendly–Unfriendly; Responsible–Irresponsible; Good–Bad; Unthreatening–Threatening.	0.7	0.3	0.9	0.8	0.8	0.6	0.6	0.3
Evaluation of landowners Respectful–Risky; Quiet–Noisy; Similar to me–Different from me; Polite–Impolite; Courteous–Discourteous; Friendly–Unfriendly; Responsible–Irresponsible; Good–Bad; Unthreatening–Threatening.	0.7	0.5	0.9	1.0	0.8	1.1	1.0	1.2

^a The number shown in the table is the mean value of agreement with the paired words, from –2=negative to 2=positive.

Table 6. Focus of experience and average response ^a to statements by responding ownership groups in the NYGL surveys.

Focus of Experience	Group							
	PWC Owner		Motorboat Owner			Landowner		
	PWC-m-l	PWC	M-pwc-l	M-l	M	L-m-pwc	L-m	L
Focus on safety I operate the jet ski (or motorboat) safely and comfortably I pay attention to the distances from other boats, jet skis, docks, etc.	4.6	4.5	4.4	4.5	4.4	—	—	—
Focus on speed and skill I pursue high speed and fun on jet skiing or motorboating I practice my jet skiing or motorboating skill	3.4	3.6	2.7	2.9	2.8	—	—	—
Focus on social and the nature I enjoy talking to or making friends; I enjoy xxx ^b with my family I enjoy the scenery during xxx; I look for fish, plants or wildlife	3.4	3.3	3.6	3.7	3.7	3.7	3.7	3.4

^a The number shown in the table is the mean value of agreement with the statement, from –2=strongly disagree to 2=strongly agree.

^b For the three different surveys, xxx means jet skiers, motorboaters, and riparian landowners to the related respondents.

Focus on Experience

PWC owners and motorboat owners were asked to evaluate how they focused on the 8 questions about their recreation experience. Only four of the 8 questions were used in the landowners' survey because they answered questions based on their enjoyment of their properties (Table 6). Both PWC owners and motorboat owners responded that they focused on safety seriously (4.4–4.6). PWC owners seemed more

focused on speed and skill (3.4–3.6) than motorboat owners (2.7–2.9). Although PWC owners reported they moderately focused on social and nature settings (3.3–3.4), motorboat owners and landowners (3.4–3.7) had a slightly higher response than PWC owners. These results indicate that PWC owners are strongly speed and skill oriented and both PWC owners and motorboat owners care about safety issues and enjoy nature and social settings. Compared to

PWC owners, motorboat owners reported that they were seeking social and nature enjoyment but are not as focused on high speed and fun.

Perceived problems from PWC use and motorboat use

Respondents were asked to evaluate 10 statements about potential problems caused by PWC use and motorboat use (Table 7). The 10 potential problem statements related to PWC use were statistically grouped into two factors: Operator Behavior & Machine Impact Related Problems and Environmental Related Problems. Potential problem statements related to motorboat use were statistically grouped into three factors: Operator Behavior Related Problems, Machine Impact Related Problems, and Environmental Related Problems. Operator Behavior & Machine Impact Related Problems were grouped into the same factor for PWC use but separated for motorboating and that may indicate that when considering problems, respondents consider PWC's and PWC use together but consider motorboats and motorboat use separately. Generally, the perceived problems from both PWC use and

motorboating were reported as low to moderate in the NYGL area (0.9~3.1). Respondents perceived PWC users as having higher levels of Operator Behavior & Machine Impact Related Problems (1.0~3.1) than Environmental Related Problems (0.7~2.2). In addition, motorboaters perceived Operator Behavior & Machine Impact Related Problems from PWC use as higher than landowners did. All groups perceived Machine Impact Related Problems from motorboating more significant than Environmental Related Problems and Operator Behavior Related Problems from motorboating. Landowners seemed to perceive more trouble from motorboating than the other groups and they considered Machine Impact Related Problems from motorboats as serious as those from PWC's. Again, these results suggest a series of asymmetric interferences among the three groups—both PWC owners and motorboat owners affected landowners, motorboat owners were affected by PWC owners but not by landowners, and PWC owners were not generally affected by the other two groups

Table 7. Perceived problems from PWC use and motorboat use and average response^a to statements by responding ownership groups in the NYGL surveys.

Perceived Problems From PWC Use And Motorboating	Group							
	PWC Owner		Motorboat Owner			Landowner		
	PWC-m-l	PWC	M-pwc-l	M-l	M	L-m-pwc	L-m	L
Operator behavior & machine impact related problems from PWC use Speeding; Noising; Waking; Distance Problems; Crowding; Meeting a PWC.	1.4	1.0	2.0	2.8	2.9	1.4	3.1	2.4
Environment related problems from PWC use Coast erosion; Impacts on wildlife; Impacts on fish; Water pollution	0.9	0.7	1.5	1.9	2.0	0.9	2.1	2.2
Machine impact related problems from motorboating Speeding; Noising; Waking	1.9	1.9	1.9	2.5	2.6	2.0	2.7	2.5
Environment related problems from motorboating Coast erosion; Impacts on wildlife; Impacts on fish; Water pollution	1.3	1.5	1.5	1.7	1.8	1.1	2.1	2.2
Operator behavior related problems from motorboating Distance Problems; crowding; Meeting a PWC.	1.1	1.1	1.2	1.6	1.5	2.0	1.9	1.7

^aThe number shown in the table is the mean problem level from 0 = not problem to 5 = serious problem.

Table 8. Visitor values and average response^a to statements by responding ownership groups in the NYGL surveys.

Visitor values	Group							
	PWC Owner		Motorboat Owner			Landowner		
	PWC-m-l	PWC	M-pwc-l	M-l	M	L-m-pwc	L-m	L
Positive Statements PWC users are experienced. Motorboaters do not mind boating in sites used by PWC's. Meeting a PWC makes a boat trip more interesting.	-0.2	-0.1	-0.3	-0.8	-0.8	0.0	-0.8	-0.3
Negative Statements PWC users do not pay attention to their impacts on other users. When motorboats meet a PWC, boating safety problems become significant. PWC use causes more environmental impact than motorboat use. PWC causes more impacts on other visitors than motorboat use. Seeing a PWC seems out-of-place. Motorboats are more appropriate than a PWC in the coastal area of NYGL's.	-0.5	-0.7	-0.1	0.6	0.5	-0.4	0.6	0.4
Regulations Boating regulations are the same for motorboats and PWC's. Speed limits for motorboats are the same as for PWC's.	0.8	0.7	0.8	0.4	0.5	0.7	0.4	0.1

^a The number shown in the table is the mean value of agreement with the statement, from -2=strongly disagree to 2=strongly agree.

Visitor Values

Thirteen statements were used to evaluate the compatibility between motorboating and PWC use. Two statements were eliminated because of their low statistical reliability. The remaining 11 statements were grouped into three factors: Positive Statements, Negative Statements, and Regulations (Table 8). All ownership groups, even PWC owners, disagree with the positive statements for PWC use, especially motorboat owners (-0.8) and motorboat owners with land (-0.8). However, PWC owners disagree (-0.1--0.7) with the negative statements about PWC use, whereas people without PWCs agree with the negative statements about PWC use (0.4-0.6). Interestingly, evaluations from people without PWCs were negative towards PWC use and people with PWCs perceived they were not compatible with other users, but not as serious as other ownership groups thought. Although NYC speed and distance from fixed object regulations are the same for motorboat use and PWC use, all groups did not strongly agree with these true statements (0.1-0.8). This suggests that respondents were not completely familiar with boating regulations.

Recreation Conflict Sensitivity

Respondents were asked to evaluate their sensitivity to interference when they encountered 11 recreation activities. Factor analysis produced three factors: High Sensitivity, Medium Sensitivity and Low Sensitivity (Table 9). All groups were highly sensitive to PWC use, motorboating

and water skiing. Water skiing was considered similar to PWC use and motorboating because of its high speed and large space requirements. Although all the 8 groups had a lower sensitivity to scuba diving, snorkeling, swimming and windsurfing, it is expected that users of those activities would be sensitivity to conflicts from motorboating and PWC use. Generally, all values in the table were less than 2.0, indicating recreation conflict existed but was not high in NYGL. However, all motorboaters and those landowners without PWCs had a higher sensitivity for conflict from PWC use, motorboating and water skiing than PWC users.

Distance Norms

Respondents were asked to report their preferred distance from their own activities to personal watercraft use. The 5 categories for preferred operating distance ranged from 100' to 1000' or above (Figure 1). The current NYS regulation is that personal watercraft and boats must operate at 5 m.p.h or less when within a 100 foot from shore or any other fixed object. Although many users with PWC reported the current NYS regulation was acceptable to them most motorboaters and landowners without PWCs preferred more distance from operating PWC. About 45% of PWC users preferred longer distances from other PWC users. In addition, a noticeable proportion of non-PWC users reported 1000 feet or more was needed from PWC users and this might indicate their negative experiences from PWC use.

Table 9. Recreation conflict sensitivity and average response^a to statements by responding ownership groups in the NYGL surveys.

Recreation Conflict Sensitivity	Group							
	PWC Owner		Motorboat Owner			Landowner		
	PWC-m-l	PWC	M-pwc-l	M-l	M	L-m-pwc	L-m	L
High sensitivity								
PWC use; Motorboating; Water skiing	0.9	0.9	1.5	1.9	1.9	0.9	1.9	1.7
Medium sensitivity								
Boat fishing; Bank or shore fishing;	0.5	0.6	0.5	0.5	0.5	0.3	0.4	0.3
Canoeing & kayaking; Sail boating								
Low sensitivity								
Scuba diving; Snorkeling; Swimming; Windsurfing	0.4	0.6	0.4	0.4	0.4	0.2	0.3	0.2

^a The number shown in the table is the mean value of sensitivity level, from 0=never interferes to 5=extremely interferes.

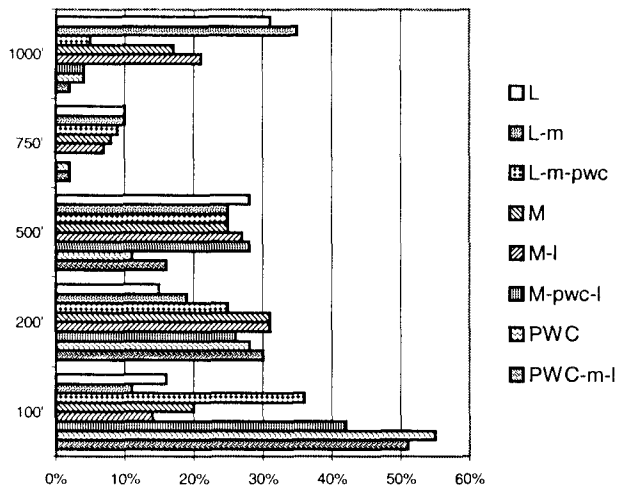


Figure 1. Preferred operating distances from PWC users.

Respondents were asked to report their preferred distance from their own activities to motorboating and their responses seemed more constant than for PWC use. For all groups, more than 60% reported a preferred distance of more than 100 feet from operating motorboats (Figure 2). Even 65% of motorboaters (M) preferred longer distances from other motorboats. And 24% of landowners (L) preferred 1000 feet or more from motorboating activities. These results indicate that landowners were affected by motorboating activities and the current NYS regulation for motorboats to allow a 100 foot zone of 5 m.p.h. from the shore and other fixed objects may not be sufficient from their perspective as coastal users.

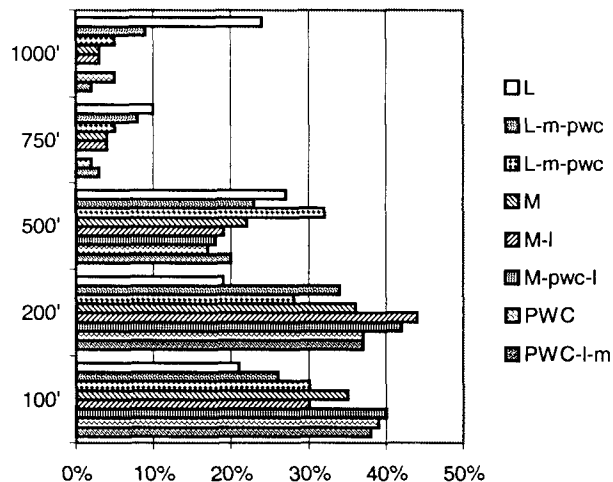


Figure 2. Preferred operating distances from motorboats.

Motorboat and PWC operators were asked to report their preferred distance from their own activities to shore line (Figure 3). The results were constant among most groups and about 70% of PWC users and motorboaters cumulatively reported preferred distances of more than 100

feet. These results indicate that the current NYS regulation for motorboaters and PWC operators to allow a 100 foot zone of 5 m.p.h. from the shore and other fixed objects may not be sufficient from the motorboaters and PWC operators perspectives as coastal users.

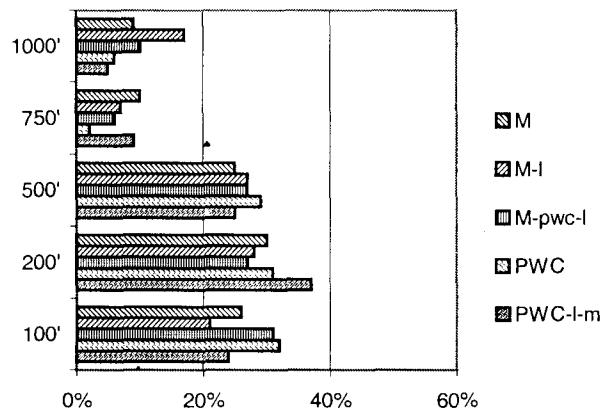


Figure 3. Preferred operating distances from shoreline.

Activity Interference

Recreation conflict was measured by asking respondents if they had any perceived activity interference during their recreational use of NYGLs. If respondents answered "yes", they were asked to describe their experiences. The experiences described were organized into four categories: physical problems and situations, interference from motorboaters, interference from PWC users, and interference from both motorboaters and PWC users. Physical problems and situations referred to such as low water levels in the lake, limited boating access, enforcement issues, water pollution, and other problems. PWC users were somewhat bothered by physical problems and motorboaters were bothered by PWC use and physical problems. Landowners were affect by both motorboating and PWC use (Table 10).

Table 10. Percent of respondents with perceived interference with water-based recreation activities in NYGL.

	No Problems	Physical Problems	Motorboat Use	PWC Use	PWC and Motorboat Use
PWC-m-l	85	7	3	5	0
PWC	74	14	5	4	3
M-pwc-l	78	8	2	8	4
M-l	60	11	4	16	9
M	80	9	2	1	8
L-m-pwc	69	0	12	5	14
L-m	40	1	6	25	28
L	61	1	4	11	23

Observations and Implications

The study results suggest several important implications and issues. First, a series of "asymmetric conflicts" were evident between landowners who were bothered by both PWC users and motorboaters, motorboaters who were bothered by PWC users but not much by landowners, and

PWC users who did not seem to be affected by either motorboaters or landowners. Resource dependence as is one possible reason to explain this situation. Landowners are more dependent on the NYGL because of their property ownership and this area is more meaningful for them and hard to substitute with other resources. However, PWC users and motorboaters are more flexible when using this area because alternative areas are available in NYGL or inland in NYS for their activities. PWC use usually interfere with motorboaters by speeding, jumping their wakes to close to the boat, or causing motorboaters to have to alter their boat direction to avoid PWC. However, both PWC use and motorboating interfered with landowners because of motor noise, concerns for safe watercraft and boat operating, and privacy issues when using coastal property at the waterfront.

Asymmetrical recreation conflicts are a common conclusion in many published studies (Adelman et al. 1982; Ruddell and Gramann 1994; Ramthun, 1995) and that concept is also supported by this study. The series of asymmetrical conflicts points out a potential problem in multiple use areas in which several activities could be available at the same time. Some users reported spatial or site-to-site displacement when experiencing recreation conflicts. Based on the concept of a series of asymmetrical conflicts, recreation planners and managers may have to identify the groups experiencing more interference and minimize potential conflict for the affected groups in multiple use zones. Place dependence and sensitivity to conflict could be possible indicators to identify potential conflict in a recreation area. Failing to maintain the recreation quality for visitors who are sensitive to conflict may cause the affected groups to be dissatisfied and could displace their activities.

The study suggests that education programs may help to reduce the conflict. In this study, PWC users perceived they were not appreciated by other users; however, they thought safety issues and their behaviors were not as bad as other groups thought. Motorboaters perceived interference from PWC use, but did not perceive that they also caused problems to landowners. Interestingly, both motorboaters and landowners with PWC had more sympathy for PWC use and users, possibly because these people had similar recreational motivations as PWC users and perceived what PWC users were feeling during their activities. A similar situation happened between motorboaters and landowners. Landowners with motorboats were not against motorboating as much as landowners without watercraft. This indicates that people participating in multiple activities, with the potential conflicts, may have more empathy and tolerance for other types of visitors. Therefore, recreation managers may reduce some perceived recreation conflict by increasing users' tolerance through "experience sharing" among different user groups.

PWC users are highly motivated on social interaction and nature enjoyment although less than motorboaters and landowners. PWC users focused on social interactions and nature as much as the other groups for their experiences. It is reasonable to educate PWC users what other groups

concerns are about their machine disturbing the nature environment and their behavior can potentially interfere with other user groups experiences. Education programs could enhance users' perceptions about activity impacts on the social and natural environments and provide appropriate compensatory strategies to avoid conflict such as selecting a quieter 4-cycle PWC motor, participating in suitable and appropriate areas for PWC that minimize impacts, and acting courteously to other users to reduce conflict (e.g., understanding other user's motivations, the difficulties of operating larger boats, the rules of navigation for all types of boats).

User's perceptions of boating regulations (Table 8) suggest that many users do not understand the current NYS regulations for motorboating and PWC use. In addition, the landowner's responses indicate not only their unfamiliarity with NYS boating regulations but also their strong feelings against PWC use. Education strategies can offer opportunities to enhance user's knowledge of boating regulation and increase tolerance among different user groups.

Study results indicate that although the preferred operating distances between PWC, motorboats and riparian properties were different, the majority of users preferred more than 100 feet between these activities. Users preferring more distance between users may feel this way because of motor noise, concern for safety, perceptions of crowding, disruptive or unsafe behaviors, and privacy issues. Riparian landowners, for instance, felt noise and speeding from PWC use and motorboating disturbed their daily life and this type of use close to their properties caused privacy problems and may pose a safety concern for their family when wading, swimming, or fishing. PWC users reportedly bothered motorboaters by following them too close, jumping the boat wakes, or interrupting their boating course. Overall, most respondents in this study preferred longer distances between recreational activities which might be due to the fact that NYGL has a large water surface area for users to participate in various activities.

Although some changes are suggested by this study based on the distances preferred, other alternatives need more consideration, such as noise reduction through mechanical technology and changes in boat and PWC operator behavior. For example, studies about the impacts of motors on the nature environment or wildlife could help users to understand how these issues are directly related to distance from shore and other users activities (e.g., observing wildlife or fishing). New boat and PWC motor technology also helps to reduce noise levels and minimize the impacts to the natural environment. The types of water bodies and various bank or shoreline situations, are important considerations in distance regulations because large limits distance may be appropriate for open water areas like NYGL, but not in narrow rivers or bays because such distance restrictions may limit the use of PWC and motorboats in some areas altogether.

In summary, recreation conflicts among PWC use, motorboating and landowners are not serious in most NYGL areas probably because of its large water surface

area. However, problems emerged near coastal areas because of more interaction among those different users. Users with single and multiple recreation activity experiences are similar in the pattern of responses when considering recreation conflicts, but different in the value of each factor response. Study results reveal a series of asymmetrical conflicts that may imply current multiple use recreation may not be a good strategy in terms of reducing recreation conflict. The study also suggests education programs were needed to reduce conflict and increase compatibility between different user groups. However, preferences for large distances between users during their activities, and the implication that users may accept increases in the 100 foot limit in which boats must operate at 5 m.p.h or less from shore, should not be generalized to inland lakes or river systems because the physical environment (e.g. area, waves, wind, shoreline and adjacent lands) of the NYGL is different from those other inland NYS water areas.

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SCUBA DIVING & UNDERWATER CULTURAL RESOURCES: DIFFERENCES IN ENVIRONMENTAL BELIEFS, ASCRIPTIONS OF RESPONSIBILITY, AND MANAGEMENT PREFERENCES BASED ON LEVEL OF DEVELOPMENT¹

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Abstract: This study examined SCUBA divers' level of development in relationship to environmental beliefs, ascriptions of responsibility, and management preferences concerning the use and management of New York's Great Lakes' underwater cultural resources. More than 850 New York State divers were surveyed during the fall of 1999, ranging from novices to experts and post-experts. Particular emphasis was placed on measuring extent of agreement with statements that focused on the use and preservation of underwater artifacts, which implicitly involved issues related to accessibility of abandoned shipwrecks. Although divers of all levels of development did tend to share certain beliefs, ascriptions of responsibility, and management preferences, the strength of agreement with half of the statements did differ by level of development. The predicted pattern of increasing in strength from beginner to expert and declining again for post-expert stages was supported in nine cases, while post-experts continued a more direct linear relationship with three items. In these particular cases, a "history effect" may have had an influence on post-expert divers. The results of this study documented the need for continuing support to educate divers on safe and responsible use of underwater resources.

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Introduction

Tourism professionals, community developers, and SCUBA divers are concerned with the protection and use of underwater cultural resources in New York's Great Lakes, an area encompassing the two lakes bordering the state (Ontario and Erie) as well as the two rivers that feed into them (the Niagara and St. Lawrence). Increased interest in SCUBA diving in this area has been attributed to two recent factors.

First, water clarity has significantly increased within the last ten years, due not only to pollution control programs, but also to zebra mussel infestations. This overpopulated exotic species is predominantly known for its negative environmental impacts: disturbing the natural balance of the Great Lakes' ecosystem as well as clogging drainage pipes to and from water, electrical, and industrial plants (Hogan, 1996). However, by filter feeding on phytoplankton and zooplankton, this dominating pest has dramatically increased the water clarity of murky waters, a positive effect appreciated by SCUBA divers (Hogan, 1996). Instead of seeing only a few feet under the water's surface (as was the case prior to 1988, the year the first zebra mussel appeared in the Great Lakes), divers can now see 20 to 60 feet (Zeidner, 1996).

Second, the passage of the 1987 Abandoned Shipwreck Act (ASA) has led to greater interest in shipwreck diving and artifact finding. Due to its vast cultural resources, the Great Lakes region is considered by many to be the best cold water diving location in the United States; in fact, the region has a reputation of offering the best shipwreck diving in the world, with vessels dating back to the Revolutionary War (brochure, no author).

Importantly, the ASA shifted ownership of underwater shipwrecks from the federal government to each individual state in which they are found. New York allows and even encourages exploration, but divers are prohibited from taking and even touching artifacts that are found under the surface. When a diver removes an item from its original setting the value, integrity, and significance are lost because the whole picture and its surroundings are missing. According to researchers, historians, and state agencies, however, removal of items from under the surface is a noticeable problem because the act is so hard to enforce (Zeidner, 1996).

Because SCUBA diving is gaining in popularity, the potential to affect not only underwater cultural resources, but also marine resources and fragile ecosystems, is high (Davis & Tisdell, 1996; Fabbri, 1990). The underwater environment is delicate and can become unbalanced and threatened more easily than realized. However, as most studies incorporating Dunlap & Van Liere's (1978) "New Environmental Paradigm" scale have shown, those who participate in outdoor recreation and are members of environmental organizations tend to have positive attitudes toward the environment. Possessing pro-environmental attitudes, however, has not been shown to automatically lead to environmentally responsible behaviors. Only

recently have several studies demonstrated fairly strong support for the relationship between outdoor recreation participation and pro-environmental behaviors (Nord, Luloff, & Bridger, 1998; Theodori, Luloff, & Willits, 1998; Tarrant & Green, 1999; Theodori & Luloff, 1999).

Water recreationists are generally less aware than land-based outdoor recreation participants of the negative effects they may cause the marine environment, because a change in water quality may happen over a period of time with less indication of the direct cause (Wall & Wright, 1977). Of particular note, inexperienced divers tend to contribute more to environmental damage than skilled divers because of their inability to control buoyancy under the surface. A direct result of this lack of control is stirring up silt clouds that suffocate and kill organisms, as well as touching, bumping, and crashing into shipwrecks, reefs, and other ecologically and culturally significant resources (Davis & Tisdell, 1995). In order to minimize effects on the environment, Graver (1999) suggests diving should be a "no contact" activity. Although SCUBA diving is a self-regulated industry, participation does require certification. Many certification agencies include environmental awareness in their courses, but because certification does not expire, being kept informed of how not to negatively affect the environment may not occur (Davis & Tisdell, 1995).

As the above discussion demonstrates, factors such as skill level, experience, and knowledge seem to be directly related to divers' level of development. In the literature two prominent leisure theories, amateur/professionalism and specialization, form the basis for studying the growth, progress, and development of participants in leisure activities.

Perhaps best known for proposing a progression of commitment, Stebbins (1979, 1992) studied "serious leisure" and amateurism in art, entertainment, science, and sport. According to his theory, as an activity becomes more important to participants, they progress from dabblers to novices, amateur participants, or amateur devotees, or may even become paid professionals. In describing participants' career histories, however, Stebbins also described a stage of decline or post-professionalism. Scanlan, Ravizza & Stein (1989) demonstrated many of Stebbins' concepts in their study of elite figure skaters by documenting five phases of development (with the final two characterized as retirement from competitive skating, and staying involved past retirement through coaching or show performing), based on skaters' evolving commitment, achievement, and involvement. In her study of quiltmakers, Todd (1998) also documented a progression and retrogression of development. Data from 459 quiltmakers (including 24 inactive quiltmakers) showed that level of quilting development was related to measures of equipment, knowledge, experience level, perceived skill, participation, and commitment; mean scores for each of these factors increased from beginners through experts and then declined for post-experts.

On the other hand, Bryan (1977) defined specialization as "a continuum of behavior from the general to the particular, reflected by equipment and skills ... and activity preferences" (p. 175). Degree of specialization was defined as a function of one's time, money, equipment, skill, and psychic commitment to an activity. In his study of fly fishermen, as specialization increased, Bryan found that attitudes and values about the activity changed, affected in part by the prominence of a leisure social world. Bryan suggested that the activity was linked to the properties of the resource in which the sport was practiced, with the specialist wanting to be able to control and manipulate the resource setting in such a way that skill and luck could be differentiated.

In addition, Bryan (1977, 1979) found that more experienced anglers developed a preservationist focus where nature and the setting were more important than actually catching fish, versus the consumptive point of view found in less developed anglers. Similarly, when Katz (1981) evaluated the relationship between environmental attitudes and specialization of fly fishermen, he found that concern for the environment increased as specialization increased. Kauffman (1984) reinforced this notion in his study of canoeists; environmental attitudes toward the resource base increased as level of specialization increased, and were strongest for highly specialized canoeists. However, it is important to note that none of these studies accounted for what eventually happens to specialists once their levels of development begin to decline, i.e., the existence of a post-professional or post-expert phase.

Purpose of the Study

This study therefore examined SCUBA divers' level of development in relationship to their environmental beliefs, ascriptions of responsibility, and management preferences concerning the use and management of New York's Great Lakes underwater environment. It was hypothesized that divers with higher levels of development (i.e., beginners through experts) would have stronger beliefs about the use of underwater cultural resources. It was also expected that divers with higher levels of development would tend to take more responsibility for their actions and prefer management actions that place more responsibility on divers to police themselves rather than encourage the use of invasive, controlling management actions. In each case, it was further hypothesized that post-expert divers would decrease in the strength of their responses when compared to experts.

This study could establish the extent to which theories of specialization and amateur/professionalism may be applied to SCUBA divers. By documenting a progression of novice through post-expert divers, the applicability and generalizability of the models could be significantly expanded. As Somers (1988) writes,

SCUBA diving is often referred to as a "recreational sport." However, the term "sport" sometimes implies erroneous connotations and

limits understanding. SCUBA diving can be an avocation or a vocation. It is a pastime, a pursuit, or even a lifestyle, that can be as limited or extensive as one makes it. A person's level of commitment, degree of skill, and types of equipment all depend on what he/she wants out of SCUBA diving. (On-line abstract)

This study could also document the need for continuing support to educate divers on safe and responsible use of underwater resources so that they learn to preserve as well as appreciate them. Without users' environmental awareness and the implementation of environmentally responsible management practices to help sustain the underwater environment, the very resource that SCUBA diving depends on may disappear and become unavailable for future use.

Methods

Two methods of data collection were used: focus group interviews and a mail survey. First, during the month of June 1999, six focus group interviews were conducted in five key locations across the New York Great Lakes Region: Buffalo/Niagara Falls, Rochester, Syracuse, Oswego, and Clayton (2 groups). For each meeting, a key informant helped organize 4 to 12 divers representing a wide range of diving levels. Using an established protocol, the primary investigator asked a series of 6 questions; each tape-recorded meeting lasted approximately 90 minutes. Major themes of discussion were then gleaned from the focus group data to aid in the development of a 16-page written questionnaire.

The second method of data collection involved mailing 2850 surveys to a sample of active and inactive New York State divers. A database of approximately 6700 individuals was compiled from various resources, including a national certifying agency, a statewide organization, a dive symposium, a dive shop, a non-profit organization, and several dive clubs.² In order to select a sample of 2850 divers, addresses were stratified by major regions across the state. Primary emphasis was placed on contacting divers in the regions closest to the Great Lakes, with subsequently less emphasis placed the farther away one resided. Consequently, those selected to receive the survey included all available names from some regions and a random selection from other regions. A total of 2850 surveys was then mailed during October 1999, followed by reminder postcards and a second mailing of the survey to non-respondents.

For purposes of this study, respondents were asked to rate a total of 18 statements concerning the use and management of the underwater environment on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Statements were worded to reflect beliefs (9 statements), ascriptions of responsibility (3), and management preferences (6). Particular emphasis was placed on measuring extent of agreement with statements that focused on the use and preservation of underwater artifacts, as well as issues of accessibility to abandoned shipwrecks. Respondents were also asked to rate the extent to which 6 specific management actions would affect their diving experiences if they were to encounter them while diving in New York's Great Lakes region. Choices on a 7-point scale ranged from -3 (negatively) to +3 (positively) with 0 representing no effect.

Level of development was operationalized by a self-selected single measure, where respondents were asked to characterize their current stage of development as a diver by choosing one of the following five categories: beginner, intermediate, advanced, expert, or "post-expert – not the expert I once was."

One-way analysis of variance was used to determine if a difference existed among mean scores for each statement (worded as a belief, ascription of responsibility, management preference, or effect of management action) by level of development. To compare the differences between mean scores for each pair of developmental levels, Scheffé's was used as a post hoc test if the F-value was significant ($p < .05$).

² Cooperation was received from the following organizations: Professional Association of Diving Instructors (PADI); New York State Divers Association (NYSDA); Great Lakes Underwater III Symposium; Syracuse's National Aquatic Service, Inc.; Bateaux Below, Inc.; Rochester's Rec Divers club; Buffalo Aqua Club; Syracuse University's dive club; and Central New York Dive Club.

Table 1. Environmental Statements with a Majority of Respondents Agreeing

Item	Mean	% who disagreed	% who were neutral	% who agreed	n
If I take an artifact and so does every one else, nothing will be left for anyone to see.	4.2	8.1	9.1	82.8	804
Compared to 10 years ago, the underwater visibility in NY's Great lakes is better.	4.1	2.9	32.0	65.1	771
There should be stift fines for divers who take valuable historical artifacts.	4.0	11.3	14.1	74.6	799
Compared to 10 years ago, I am more environmentally conscious and sensitive to environmental issues than I used to be.	3.9	10.2	20.7	69.1	797
Information about shipwreck locations should be made easily accessible to the public.	3.8	7.7	22.7	69.5	801
Directly contacting objects on abandoned shipwrecks causes them to deteriorate.	3.7	10.1	28.0	61.9	801

Table 2. Environmental Statements with a Majority of Respondents Disagreeing

Item	Mean	% who disagreed	% who were neutral	% who agreed	n
Zebra mussels should be removed from the surfaces of shipwrecks so I can see them better.	2.4	55.0	34.1	11.0	797
If I don't take an artifact as a souvenir, someone else will.	2.3	61.9	21.8	16.2	801

Table 3. Environmental Statements with a Majority of Respondents Remaining Neutral

Item	Mean	% who disagreed	% who were neutral	% who agreed	n
Canada does a better job of protecting and regulating shipwreck diving than the U.S.	3.5	3.3	59.6	37.1	767
There is government support of the diving industry in Canada.	3.4	2.4	65.8	31.8	757
There is government support of the diving industry in NY's Great Lakes.	2.6	31.7	61.6	6.7	757

Table 4. Environmental Statements with No Majority Captured by Any Response Category

Item	Mean	% who disagreed	% who were neutral	% who agreed	n
Access to abandoned shipwrecks should be unrestricted.	3.3	30.6	22.7	46.7	801
Artifacts should be collected and displayed in museums for the general public to view.	3.2	24.7	32.8	42.6	799
Fifty years is a reasonable time period to use when dating whether objects are of significant archaeological interest.	3.1	22.2	47.4	30.3	784
Diving on shipwrecks should be monitored by authorized diving guides.	3.0	35.1	27.6	37.2	803
Touching objects is okay unless they are historically significant or fragile.	2.8	41.9	23.2	34.9	794
The bubbles I blow while diving can have an impact on the underwater environment.	2.6	46.4	28.6	15.0	796
It is okay to recover objects that have sunk to the bottom and will disappear anyway.	2.6	46.0	29.1	24.9	800

Results

Although 2850 surveys were originally mailed, 490 (17 percent) were returned either as undeliverable or noted as having been sent to non-divers. (While an unusable rate of 10 percent is common for studies of this nature, the higher undeliverable rate for the current study was not unexpected. One focus of the overall project was to uncover why divers cease participating; thus, some of the addresses used were up to 10 years old, increasing the chance of incorrect addresses.) Of the remaining 2360 potential respondents, 869 usable questionnaires were returned, yielding a 37 percent response rate.

Four out of five respondents were male. While ages ranged from 12 to 80, the average age reported was 43. Half of the respondents had earned 2- or 4-year college degrees, while another quarter had received advanced degrees. Half reported earning more than \$60,000 in household income per year.

Due to the relatively low response rate, a non-respondent bias check was conducted by phone. Non-respondents did not differ significantly from respondents when age, gender, education level, number of years spent diving, or stage of development were compared. However, significantly lower percentages of non-respondents were certified or active divers. Thus, when interpreting results, it is important to remember that diving was likely to have been more salient for respondents than non-respondents.

When rating a total of 18 statements concerning environmental beliefs, ascriptions of responsibility, and management preferences on a 5-point agreement scale, a majority of respondents tended to agree with the six statements shown in Table 1. These statements generally reflected a pro-environmental attitude and awareness of the consequences of disturbing underwater artifacts. A majority of respondents tended to disagree with only two statements: "Zebra mussels should be removed from the surfaces of shipwrecks so I can see them better," and "If I don't take an artifact as a souvenir, someone else will." (See Table 2.) Interestingly, a majority of respondents tended to be neutral towards three items: "Canada does a better job of protecting and regulating shipwreck diving than the U.S.," "There is government support of the diving industry in Canada," and "There is government support of the diving industry in NY's Great Lakes." (See Table 3.) Those who were not neutral, however, were much more likely to feel that Canada does a better job than the U.S. of supporting the dive industry and protecting underwater resources. Responses for the remaining seven statements were more evenly distributed among respondents, with no clear majority agreeing, disagreeing, or being neutral. (See Table 4.)

Respondents were also asked to rate the extent to which six specific management actions would affect their diving experiences if they were to encounter them while diving in New York's Great Lakes region. Choices on a 7-point

scale ranged from -3 (negatively) to +3 (positively) with 0 representing no effect. Approximately 75 percent of all respondents answered that three items would positively affect their experience, with means ranging from +1.4 to +1.5: additional artificial reefs, more intentionally sunk ships, and underwater parks and trails. About half of all respondents felt that two items (interpretive signs [e.g., on shipwrecks, etc.], and collection and display of artifacts in an accessible underwater location for the general public to view) would positively affect their experience, but mean scores were just +0.7. Finally, respondents felt negatively more often than positively (44 vs. 32 percent) about underwater protection of artifacts (e.g., roping them off, chaining them down, putting them under plastic domes). Consequently, the mean score for that item was slightly negative (-.3).

Of the 847 respondents who selected a category to represent level of development, 198 (23 percent) marked "beginner," 267 (32 percent) were "intermediate," and 250 (30 percent) considered themselves to be "advanced." However, less than 10 percent (77 respondents) rated themselves as "expert," and only 6 percent (55

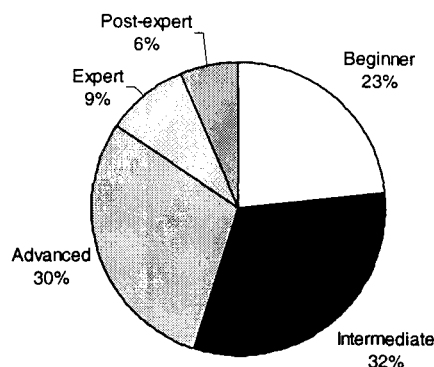


Figure 1. Level of Development

respondents) called themselves "post-expert – not the expert I once was." (See Figure 1.)

As with quiltmakers (Todd, 1998), these categories were found to adequately reflect dive-related factors of equipment owned, knowledge, experience, perceived skill, participation, and commitment, plus an additional scale measuring amateur/professional growth (Todd, 2000). For six of the scales, mean scores increased from beginner to expert and then decreased for post-experts. Experience was the only scale that displayed a different pattern: instead of declining at the post-expert stage, experience level continued to increase, due to its cumulative nature. Figure 2 highlights how post-expert scores tended to return to a level equal to those of advanced divers for six of the seven indices.

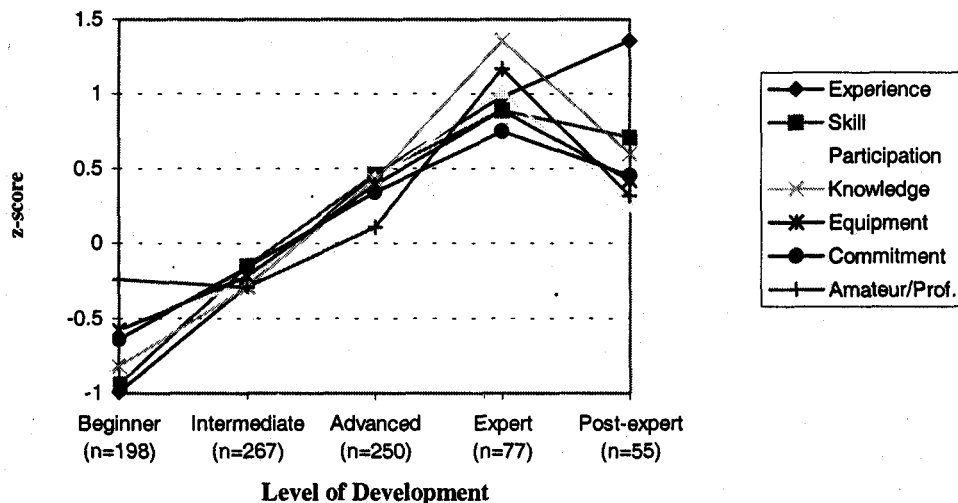


Figure 2. Factors Related to Level of Development

It was hypothesized that divers with higher levels of development (i.e., beginners through experts) would have stronger beliefs toward the use of underwater cultural resources, but the strength of these responses would decrease for post-expert divers. It was also expected that divers with higher levels of development would tend to take more responsibility for their actions and prefer management actions that place more responsibility on divers to police themselves rather than encourage the use of invasive, controlling management actions; a decrease was again expected for post-expert divers. As shown in Table 5, partial support was found for these relationships. One-way analysis of variance yielded significant differences among the mean scores of half of the 24 items based on level of development ($p < .01$): 10 of the 18 environmental statements and 2 of the 6 effects on experience quality statements.

As displayed in Figures 3 and 4, several distinct patterns emerged. First, the predicted pattern of responses increasing in strength from beginner to expert and decreasing again for post-experts was demonstrated in two ways: a progression of *agreeing* more strongly, or a progression of *disagreeing* more strongly. However, although all mean post-expert scores tended to decrease in strength when compared to experts in each of these cases, it is important to note that the decline was statistically significant for only one item: the belief that there is government support of the diving industry in New York's Great Lakes. Interestingly, experts significantly *disagreed* more strongly with this belief when compared with any other level of development. On the other hand, experts tended to *agree* most highly with a total of 8 items: the 4 beliefs that underwater visibility is better than 10 years ago, Canada protects and regulates shipwreck diving better than the U.S., the Canadian government supports the diving industry, and touching objects is okay unless they are significant or fragile; and 4 management-related variables: information on shipwreck locations should be accessible, access to abandoned shipwrecks should be unrestricted, plus additional artificial reefs and more intentionally sunk ships would enhance their diving experiences.

For the second set of patterns, instead of post-experts decreasing in the strength of their responses when compared to experts, they followed a more direct linear relationship with several items: the belief that it is acceptable to recover objects that have sunk to the bottom and will disappear anyway; and the management preference statements that there should be stiff fines for taking artifacts, and that diving on shipwrecks should be monitored by authorized diving guides. As hypothesized, divers in the beginning stages of development responded more heavy-handedly, indicating significantly more support for invasive management practices (such as fines for taking artifacts and authorized diving guides for shipwreck diving). Beginner divers were also the least likely to believe that it is acceptable to touch or recover objects.

On the other hand, there were no significant differences between diver development levels for the remaining 12 items, including all 3 ascriptions of responsibility. Specifically, all divers tended to *agree* with 3 statements: the beliefs that they were more environmentally conscious and sensitive than they had been 10 years ago, and that directly contacting objects on abandoned shipwrecks causes them to deteriorate; and the ascription of responsibility that taking artifacts will leave nothing for anyone else to see. Regardless of developmental level, all divers tended to *disagree* with the following 3 statements: the ascriptions of responsibility that their bubbles impact the underwater environment and that if they don't take an artifact someone else will; and the management preference for removing zebra mussels from shipwreck surfaces. Finally, all divers tended to be more *neutral* towards 2 statements: the belief that 50 years is a reasonable time period for dating significant artifacts, and the management preference for collecting and displaying artifacts in museums. When rating effects on experience quality, all divers felt slightly positive about encountering underwater parks and trails, interpretive signs, and displaying collected artifacts in an accessible underwater location, but were slightly negative towards noticeably invasive underwater protection of artifacts.

Table 5. Environmental Statements: One-way Analysis of Variance Using Mean Scores of Divers with Different Levels of Development

Statement	Total (n=847)	Level of Development					F	p	# of Differences Detected
		Beginner (n=198)	Intermediate (n=267)	Advanced (n=250)	Expert (n=77)	Post-expert (n=55)			
Beliefs:									
Compared to 10 years ago, the underwater visibility in NY's Great Lakes is better.	4.05	3.56^a	3.89^b	4.27^c	4.68^d	4.44^{cd}	30.00	.01	8
Compared to 10 years ago, I'm more environmentally conscious and sensitive to environmental issues	3.87	3.81	3.77	3.93	4.07	3.93	1.60	.17	n.s.
Directly contacting objects on abandoned shipwrecks causes them to deteriorate.	3.75	3.76	3.79	3.73	3.79	3.56	0.64	.63	n.s.
Canada does a better job of protecting and regulating shipwreck diving than the U.S.	3.55	3.14^a	3.36^{ac}	3.78^b	4.17^{bd}	3.73^{bc}	28.41	.01	6
There's government support of the diving industry in Canada	3.42	3.15^a	3.25^a	3.60^b	3.86^b	3.62^b	19.68	.01	6
Fifty years is a reasonable time period to use when dating whether objects are of significant archeological interest.	3.05	3.09	3.05	3.06	3.12	2.85	0.74	.57	n.s.
Touching objects is okay unless they are historically significant or fragile.	2.83	2.59 ^a	2.75 ^a	2.86 ^{ab}	3.26 ^b	3.13 ^{ab}	5.10	.01	2
It is okay to recover objects that have sunk to the bottom and will disappear anyway.	2.60	2.32 ^a	2.58 ^{ab}	2.64 ^{ab}	2.88 ^b	3.06 ^b	5.60	.01	2
There is government support of the diving industry in NY's Great Lakes.	2.63	2.92^a	2.74^{ac}	2.52^{bc}	2.07^d	2.50^c	17.79	.01	6
Ascriptions of Responsibility:									
If I take an artifact and so does every one else, nothing will be left for anyone to see.	4.23	4.24	4.22	4.26	4.32	3.96	1.11	.35	n.s.
The bubbles I blow while diving can have an impact on the underwater environment.	2.66	2.84	2.62	2.59	2.54	2.75	1.41	.23	n.s.
If I don't take an artifact as a souvenir, someone else will.	2.25	2.15	2.26	2.20	2.33	2.65	2.15	.07	n.s.
Management Preferences:									
There should be stiff fines for divers who take valuable historical artifacts.	4.05	4.20^a	4.09^a	4.08^a	3.84^{ab}	3.55^b	4.19	.01	3
Information about shipwreck locations should be made easily accessible to the public.	3.83	3.70^a	3.75^a	3.92^{ab}	4.13^b	3.87^{ab}	3.96	.01	2
Access to abandoned shipwrecks should be unrestricted.	3.28	2.92^a	3.14^{ac}	3.49^b	3.71^b	3.52^{bc}	9.71	.01	5
Artifacts should be collected and displayed in museums for the general public to view.	3.23	3.22	3.22	3.16	3.31	3.53	1.26	.29	n.s.
Diving on shipwrecks should be monitored by authorized diving guides.	2.98	3.45^a	3.06^b	2.72^c	2.68^{bc}	2.67^{bc}	12.31	.01	5
Zebra mussels should be removed from the surfaces of shipwrecks so I can see them better.	2.35	2.45	2.36	2.32	2.29	2.21	0.79	.53	n.s.

Means with different superscripts are significantly different at the .05 level. Values are mean scores on a 5-point scale ranging from strongly disagree (1) to strongly agree (5).

**Table 6. Effects on Experience Quality: One-way Analysis of Variance
Using Mean Scores of Divers with Different Levels of Development**

Statement	Total (n=847)	Level of Development					F	p	# of Differences Detected
		Beginner (n=198)	Inter- mediate (n=267)	Advanced (n=250)	Expert (n=77)	Post- expert (n=55)			
<i>Effects on Experience Quality:</i>									
Additional artificial reefs	+ 0.54	+ 1.17 ^a	+ 1.42 ^{ac}	+ 1.87 ^b	+ 1.89 ^{bc}	+ 1.25 ^{abc}	8.35	.01	3
More intentionally sunk ships	+ 0.43	+ 0.85 ^a	+ 1.18 ^a	+ 1.88 ^b	+ 2.08 ^b	+ 1.52 ^{ab}	15.35	.01	4
Underwater parks and trails	+ 0.40	+ 1.31	+ 1.35	+ 1.60	+ 1.41	+ 0.98	2.07	.08	n.s.
Interpretive signs (e.g., on shipwrecks)	+ 0.69	+ 0.66	+ 0.65	+ 0.77	+ 0.91	+ 0.30	1.07	.37	n.s.
Collection and display of artifacts in an accessible underwater location for the general public to view	+ 0.67	+ 0.56	+ 0.58	+ 0.73	+ 0.96	+ 0.80	1.03	.39	n.s.
Underwater protection of artifacts (e.g., roping them off, chaining them down, putting them under plastic domes)	- 0.33	- 0.14	- 0.37	- 0.39	- 0.25	- 0.62	0.84	.50	n.s.

Means with different superscripts are significantly different at the .05 level. Values are mean scores on a 7-point scale ranging from negatively (-3) to positively (+3) with 0 representing no effect.

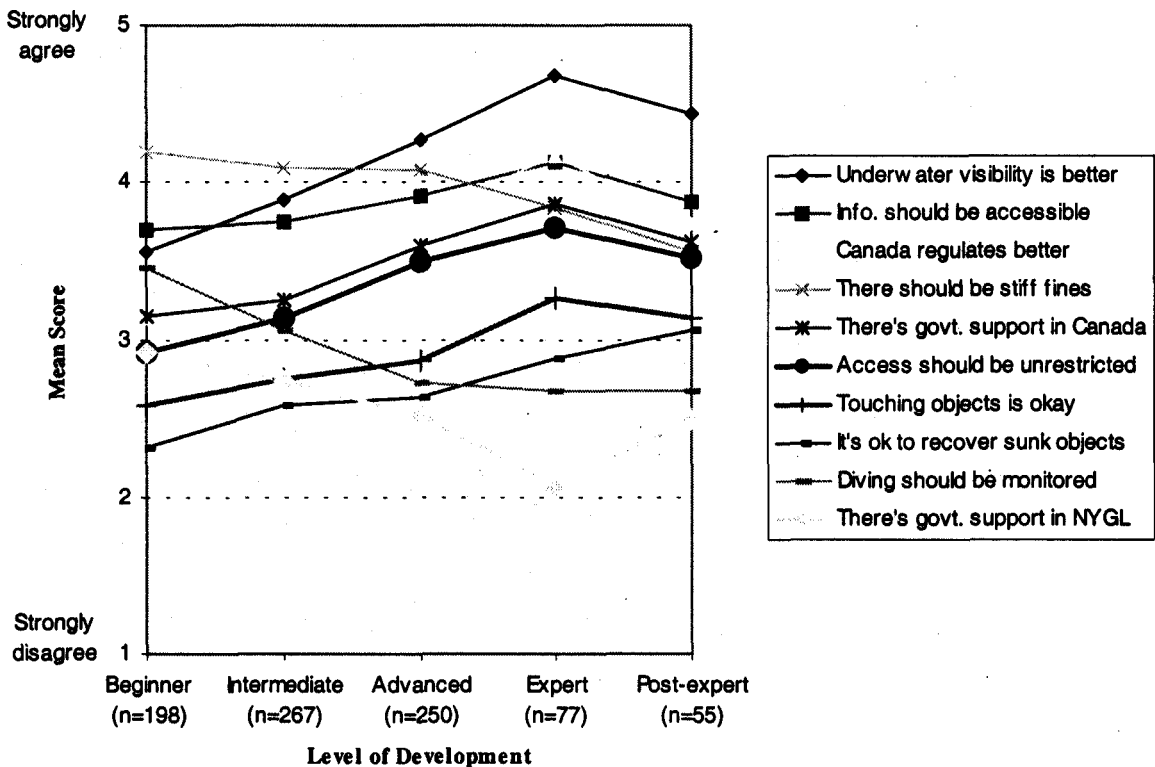


Figure 3. Environmental Statements by Level of Development

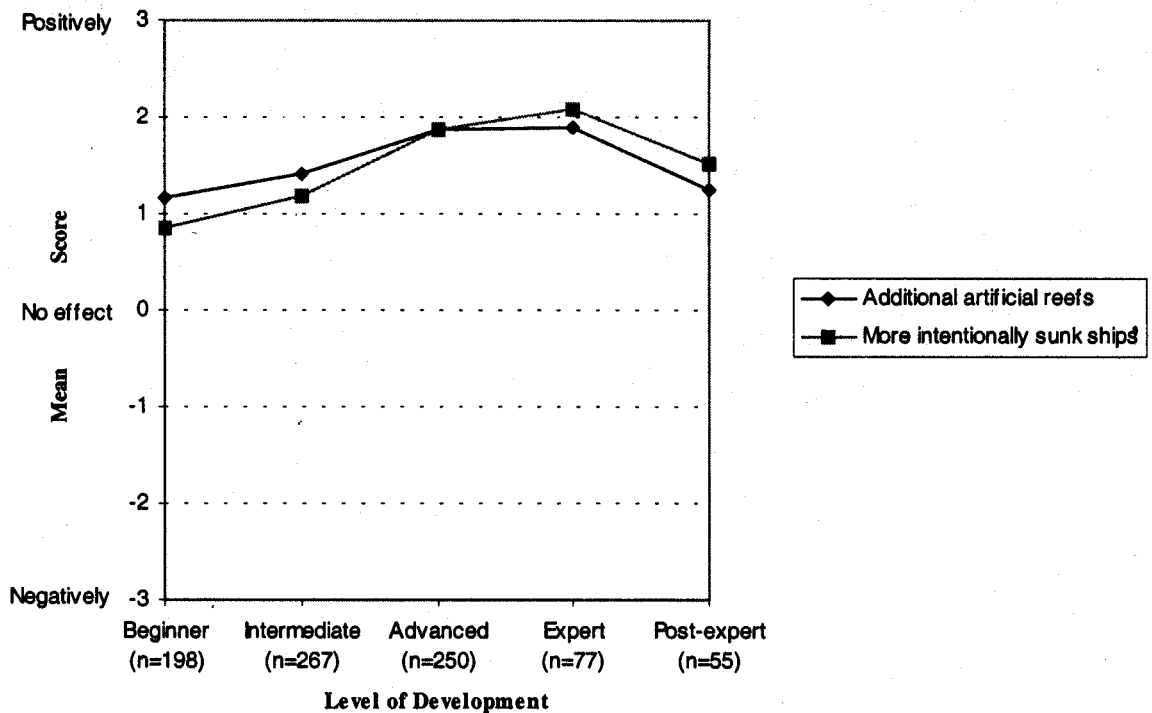


Figure 4. Effects on Experience Quality by Level of Development

Conclusions and Implications

Based upon the findings, divers of all levels of development do tend to share certain beliefs, ascriptions of responsibility, and management preferences. For instance, all divers tended to agree that they are more environmentally conscious and sensitive than they were 10 years ago, they all tended to disagree that the bubbles they blow have an impact on the underwater environment, and they all tended to be neutral on whether artifacts should be put in museums.

However, some beliefs about the use of underwater cultural resources are related to level of diving development, with a tendency to increase in strength from beginner to expert and decrease again in strength for post-experts. Of particular note, disillusion with and/or distrust of the U.S. government (especially versus the Canadian government) seems to be most evident for divers at the expert level.

In addition, some ascriptions of responsibility and management preferences also appear to be related to level of development. Divers with higher levels of development tend to take progressively more responsibility for their actions and prefer the least invasive management actions. The pattern, however, tends to vary for the post-expert phase.

As previously mentioned, beginners displayed more "purist" attitudes, i.e., were more "heavy-handed" by supporting invasive practices of fines and authorized guides, and disagreeing that it is acceptable to recover or touch objects. Perhaps beginners' lack of experience is causing them to perceive these as hypothetical situations, whereas divers with higher levels of development have actually encountered these circumstances, and, having faced reality, subsequently relaxed their purist perceptions based on true feelings.

Looking at it from a different angle, divers in the later stages of development tended to feel most strongly about being able to collect artifacts unimpaired. This seemingly "anti-environmental" response may be due in part to a history effect. Significantly, 50 percent of all experts and post-experts (specifically, more than one-third of all experts, and exactly two-thirds of all post-experts) had been diving more than 20 years (compared to just 10 percent of all beginner, intermediate and advanced divers combined.) When a large portion of these experts and post-experts started diving, artifact collecting was a major focus that was deemed highly acceptable by the dive community. Thus, their resistance to embracing and adopting the change in diving ethics may be well founded in the length of their diving histories.

Being aware of the environment and abiding by established regulations are important considerations in order for divers

to help preserve the marine environment. Divers should be role models for preservation, and proactively educate others to preserve the marine environment as well.

Not only is it essential for recreational divers to think in this manner, but these attitudes also play a key role for management agencies, instructors, clubs, and retailers. Divers often rely on charter boat operators, SCUBA diving clubs, and gear shops for current information and are influenced by their attitudes and practices when it comes to environmental issues. Divers who are involved in the community and work with organizations that advocate for the preservation of the environment benefit the dive industry the most. Management agencies need to implement management plans like Marine Protected Areas (MPAs), which use interpretive tools to educate divers and prevent the destruction of the underwater resource (Davis & Tisdell, 1995, 1996; Vereka & Ponneleit, 1981). Well designed interpretive programs can benefit the dive community by recommending dive locations, assisting with site selections, and creating an understanding of the marine and cultural environment while helping to preserve the resource (Graver, 1999; Vereka & Ponneleit, 1981).

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Ethnicity & Culture

RECREATION SAFETY IN MUNICIPAL PARKS - BLOOMINGTON, INDIANA AND TSUKUBA, JAPAN: A COMPARISON STUDY OF RISK MANAGEMENT

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Abstract: Cultural differences affects the design and use of playground equipment in parks. Comparative research exploring the differences in playground facilities, parental supervision, and use was conducted on-site in Tsukuba City, Ibaraki Prefecture, Japan and Bloomington, Indiana, USA. The study examines park design, play equipment, sports fields, use patterns, and parental supervision of children. The study evaluates the relative user risk to injury in both cultural setting.

A primary concern of park administrator in the United States is the prevalence of law suits resulting from accidents. In the United States, risk managers and playground safety specialists play key roles in park and recreation department policy making and facility design. The job of risk managers is to identify hazards and reduce the risks which are predicted to be the source of injuries and loss. In the past few decades recreation administrators have learned that users of their facilities and participants in their programs will demand compensation if they are injured. Public agencies are particularly susceptible to litigation.

Recreation related litigation and law suits are nearly non-existent in Japan's society. This fact exists with the knowledge that design of facilities and playgrounds in Japan are somewhat dangerous when compared to United States Standards. Japanese park administrators and designers appear not to be overly concerned with possible injury claims and law suits involving hazardous park conditions.

Introduction

A primary concern of U.S. municipal park administrators is law suits resulting from negligence claims. In the United States, risk managers and playground safety specialists are a vital part of many recreation departments. In the last few decades, administrators have learned that park users demand compensation if they are injured. Municipal governments are particularly susceptible to law suits because they fit the category of being financially able to pay the damages.

This study compares the different approaches to risk management between two parallel cities, Tsukuba, Japan and Bloomington, Indiana in regards to park and playground safety and risk management. It also studies the cultural differences of child supervision in the park setting.

General Background:

Tsukuba City is located approximately 60 km (37.3 miles)

northeast of Tokyo Japan in the Ibaraki Prefecture. Tsukuba City is divided into two districts: (1) The Research and Education District where research and educational institutes, commercial facilities and some limited housing are located, and (2) the surrounding suburban area. The area encompassing Tsukuba City and the suburban districts consist of approximately 28,560 hectares (110 square miles). The city's present population (1995) of 65,200 and has a projected population of 100,000 in 2020. Parks make up 100 hectares (247.7 U.S. acres) or 3.7% of the total lands with an additional 19 hectares (47 U.S. Acres) or .05% in waterways.

Tsukuba City has a total of 99 parks and green areas. There are two (2) multipurpose parks, twenty (20) neighborhood parks, forty-nine (49) child parks, and 23 green areas. The most extensive park unites are the multipurpose parks of Doho (20 hectares) or 49.5 U.S. acres) and Akatsuka (8.5 hectares or 21 U.S. acres). Doho park especially is worthy of note, with a world-class solar heated indoor swimming pool and a heat efficient gymnasium. All parks are connected to each other through the pedestrian and bicycle ways. Directly north of the Tsukuba suburban area is the extensive Suigo Tsukuba Quasi National Park. On the eastern side of the Ibaraki Prefecture is the second largest freshwater lake in Japan, Lake Kasumigaura.¹

Bloomington, Indiana is located in Monroe County, approximately 50 miles south of Indianapolis, Indiana. The city's boundary encompasses approximately 25 square miles. The city has a population of 65,000 with an additional 36,000 students enrolled at Indiana University. The Bloomington Parks and Recreation Department has 32 units and is responsible for managing more than 1750 acres of lakes, 1400 acres of natural forested acres and preserves, 600 acres of intensive use park and recreation sites, and nine buildings encompassing a total of 3750 acres.² The 192,000 acre Hoosier National Forest lies directly south of the city. The largest inland lake in Indiana, Lake Monroe, is located five miles south of the city.

Bloomington has a rich variety of recreation facilities, including Banneker Community Center, Bryan Park, Cascades Golf Course, Frank Southern Ice Arena, Griffy Lake Nature Center, Older American Center, and Twin Lakes Sports Park.

It should be noted that there are many parallel factors in comparing Bloomington Indiana to Tsukuba Japan. They both have similar populations with a considerable number of non-nationals and university students. Both have major universities and research facilities. Both cities have large areas of adjacent federal lands and a large fresh water lake nearby (Hoosier National Forest and Lake Monroe near Bloomington and Suigo Tsukuba Quasi National Park and Lake Kasumigaura near Tsukuba City).

Conclusions

There has been no litigation or claim resulting from accidents or property loss in the Tsukuba municipal parks during the last 20 years³ During the same period their has been 50

negligence claims resulting of alleged negligence in city parks resulting in six court cases.⁴ The lack of recreation related litigation in Japan may result from a combination of cultural and historical precedent, lack of understanding of Japanese laws regarding negligence, and lack of access to legal counsel, and the general attitude of the court system that lawsuits resulting from recreation activities are frivolous.⁵

Constant parental participation and supervision of children at play appears to be the rule in Tsukuba parks while direct supervision of children less than six years of age in Bloomington was normal, many children between the ages of 6-12 appeared unsupervised. Mothers and fathers take an

equal role during the evening and weekend park visits supervising the children and looking after their safety. Little differences between parental gender roles could be observed between Bloomington and Tsukuba. It was observed that the children appeared to respond more readily to parental warnings and direction in Tsukuba than in Bloomington.

Park play equipment and facilities in Tsukuba were dangerous as compared to U.S. standards. Little effort was made to soften fall areas around playgrounds in Tsukuba. Some play equipment was inherently dangerous with unstable footing, difficulty in climbing, and excessive height above ground.

Observations Regarding Parental Supervision

Age Groups	0-3	4-6	7-9	10-12	13-15	16-18	Total
U.S. Supervised	142 100%	164 92%	56 40%	8 4%	0 0%	3 2%	373 38%
U.S. Not Supervised	0 0%	15 8%	83 60%	178 96%	167 100%	154 98%	597 62%
Japan Supervised	178 100%	155 100%	138 99%	146 92%	124 83%	45 34%	786 86%
Japan Not Supervised	0 0%	0 0%	2 1%	13 8%	25 17%	89 66%	129 14%

Research conducted in Bloomington Indiana, USA and Tsukuba, Ibaraki, Prefecture, Japan

Research conducted during the month of July in 1997 and 1998

Ages determined partly by visual estimation, and partly by interview with parent(s).

1. Publication of the Ibaraki Prefecture entitled *Tsukuba Science City* dated April 1995.
2. 1992-1996 Parks and Recreation Master Plan, City of Bloomington, dated August 15, 1992 and updated to status as of August 1996.
3. Toshiichi Tada, Information Coordinator, Ibaraki Prefectural Government, Tsukuba Office, 1-10-1 Azuma, Tsukuba Ibaraki 303 Japan, Interview.
4. Records of the Monroe County Clerk of the Circuit Court, Bloomington Indiana 1976-1996.
5. Toshiichi Tada Interview, supra note 2

THE MEANING OF LEISURE: CONCEPTUAL DIFFERENCES BETWEEN AMERICANS AND KOREANS

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Abstract: Considering the importance of diversifying the concept of leisure and expanding our scope of understanding beyond cultural borders, this study examines the conceptual differences between American and Korean understandings of the term. The results revealed that there is a significant relationship between the concept of leisure and nationality. For Americans, work relation and affect were more highly related to leisure. Perceived freedom was a better indicator for what leisure means to Koreans.

Introduction

Defining leisure as well as measuring it has long been regarded as a challenge to the development in the study of leisure. Although some observers feel that it is practically impossible to define and measure leisure accurately (Mannel & Kleiber, 1997), research has increased researchers' ability to measure and study leisure from various perspectives. However, these diverse concepts about leisure have their origins in ancient western cultures and are predominantly restricted to western industrialized countries, especially, the United States, Western Europe, and Great Britain (Godbey, 1994).

Subsequently, most researchers and scholars have defined leisure within western contexts, and research areas extending beyond the boundaries of the West have been few. This western-oriented definition of leisure, therefore, reflects not only the lack of a global vision, but also limits academic and professional growth (Burnett, Uysal, & Jamroz, 1991).

Like other areas of scholarly research, the field of leisure studies needs to adopt an international perspective. The failure to globalize leisure research can result in a biased understanding of leisure. A more meaningful understanding of leisure also needs to acknowledge the broad range of cultural differences that potentially inform the concept. Even though the study of leisure has developed mainly in western countries, there is no doubt that all cultures are familiar with the concept, however they may define it. Moreover, there are several semantic and contextual parameters within which the term 'leisure' is defined in different countries or cultures (Chick, 1998). By applying a trans-national perspective to the study of leisure,

the generalizability of definitions of leisure can be tested and validated.

Considering the importance of diversifying the concept of leisure and expanding our scope of understanding beyond cultural borders, this study examines the conceptual differences between American and Korean understandings of the term. From the 1970s, Korea has undergone rapid and intensive industrialization that has profoundly influenced the way of life of the Korean people. The rise in labor productivity, the efforts of labor unions, and the development of the economy in general, have given increasing amounts of discretionary time and income to the Korean people. This, in turn, has resulted in the redefinition of the meaning of leisure among Koreans.

Even though same English word "leisure" has begun to be used frequently in daily life and society in Korea, we assume that the concept of leisure among the Korean people would not be the same as that of Americans. A Korean-Korean dictionary defines leisure as "leisure; play; leisure industry" while an English-English dictionary defines leisure as "spare time; time free from work." As the ancient Greeks described leisure as "an essence of culture," the meaning of leisure conceived by people of different nationalities could be assumed to be different (Murphy, Niepoth, Jamieson, & Williams, 1991, p.54).

Based on these assumptions, this study sets out to (1) examine the definition of leisure in terms of work, activity, and subjective experiences, (2) compare the meaning of leisure held by Americans and Koreans. Finally, we hope that this study may serve as a guide for pursuing a cross-cultural understanding of leisure where an ethnocentric bias has been pervasive thus far.

Literature Review

1. *Meaning of Leisure*

Leisure has been conceptualized and defined from a number of perspectives. These different perspectives reflect historical differences in the organization of societies as well as differences in concepts of and impingement upon both freedom and pleasure. De Grazia (1962; Leitner, Leitner, & Associates, 1995) attempted to break leisure into three distinctive aspects: time, activity, and experience. A similar orientation has continued to be adopted in conceptualizing leisure. Approaches to operationalizing leisure have been objective and subjective (Mannel & Kleiber, 1997). Objective definitions equate leisure with certain types of activity and time. In contrast, a subjective construction of leisure is associated with the occurrence of certain types of mental states, perceptions, needs, and experiences.

In the initial stages of research, leisure was typically viewed as time off work, and "time surplus remaining after the practical necessities of life have been attended to" (Godbey, 1994). Leisure has also been defined as non-work activity participation (Weiskopf, 1982) and "serious activity without the pressure of necessity" (Godbey, 1994).

Later, there was an emerging focus on psychological attributes associated with leisure (Samdahl, 1991), and leisure was construed as a "highly desired state of mind or state of being that is realized through participation in intrinsically motivated activities" (Kraus, 1984). Later, an interest in perceived freedom and the subjective dimensions of leisure have been emphasized as significant attributes of leisure (Samdahl, 1991), with the assumption that "leisure implies being engaged in an activity as a free agent and of one's own choice" (Neulinger, 1981).

More recently, a more holistic view sees leisure and work as being so closely interrelated that the two cannot be easily separated. A study by Shaw (1986) supports the contention that elements of leisure can be found in many different aspects of life. The results indicate that leisure can be experienced in work and other obligatory activities and that not all recreation time or free time may necessarily be considered to be leisure.

The term "leisure," therefore, has come to have many shades of meaning, some of which are almost entirely distinct from others. Further, some aspects of the concept of leisure may not be universally applicable. If we think of the previous definitions of leisure from the standpoint of application, it becomes apparent that research has focused on western society and people in developed countries. According to Burdge and Beckers (1984), leisure researchers are well informed about developments in the United States, but they are extremely internally oriented—the one-way-mirror problem. Therefore, it is important to question whether these objective and subjective definitions of leisure can be applied to the experiences of members of non-western societies, and researchers should bring into play various perspectives and definitions of leisure (Chick, 1998).

2. *Measurement of Leisure*

Even though the field of leisure research has lacked an empirical method to discover the determinants of definitions of leisure, several studies have attempted to address the conceptualization of leisure and its measurement. Researchers have suggested two measurement approaches using external or internal definitional vantage points (Mannell & Kleiber, 1997). If an internal definitional vantage point is adopted, the meaning of leisure is based on the perception or construal of the participants. By using the individual's own definition of leisure, a more accurate picture of how much leisure people feel they have and what is meaningful to them can be addressed. On the other hand, the external definitional vantage point is based on the viewpoints of researchers. Researchers predetermine or impose a definition of leisure on the people and this measurement is based on what people in a social group actually agree to be leisure.

In the earlier stages of leisure research, Kelly (1972) developed a sociological conceptualization of leisure. According to him, one's definition of leisure is determined by two underlying factors: work-relation and

constraint/freedom. The model suggests that leisure is best represented when persons participate in an activity without constraints (freely) and when the activity is independent of work.

Another theoretical model developed by Neulinger provides a psychological conceptualization of leisure (Iso-Ahola; 1979). A person's definition of leisure was determined by three factors: perceived freedom, motivation (intrinsic or extrinsic), and goal orientation (final or instrumental). The model suggests that leisure exists when a person perceives his freedom as being high and participates in an activity for intrinsic reasons.

The above two models were modified, by Iso-Ahola (1979), to develop the determinants of leisure. His study sought to determine the relative contributions of perceived freedom, motivation, and work-relation. The results revealed that each factor had a significant effect on the subjects' definition of leisure. More importantly, this study disclosed the interaction of freedom and work-relation.

Samdahl (1991) addressed subjective experiences—as a determinant of leisure—using the Experiential Sampling Method (EMS). The causal model of this study indicated that perceived freedom and self-expression have a significant effect on leisure but self-consciousness of leisure did not fully influence the meaning of leisure. Even though the lack of an independent effect of affect on leisure was found, a strong correlation between leisure and affect confirms that these variables are associated with one another.

Shaw's study (1984) also explored meanings of leisure and the subjective factors associated with leisure experiences. Through in-depth interviews and the diary method, determinants of leisure were chosen, including enjoyment, motivation, relaxation, and freedom of choice. These subjective factors were found significantly related to leisure experiences.

In the light of the theory and research on the nature of leisure reported in the past, the most centrally agreed upon set of attributes associated with leisure are: objective determinants (work-relation and activity) and subjective determinants (perceived freedom, self-expression, and affect). These factors were used to address the attributes of the model for this study.

Research Questions

In view of the increasing importance of transnational leisure research and considering the lack of research on the definition and measurement of leisure, this study addresses the following questions:

1. Are there distinct dimensions of the definition of leisure?
2. Is there a significant relationship between nationality and the dimensions of the definition of leisure?
3. Is there a significant relationship between

demography and the dimensions of the definition of leisure?

Method

Selection of Subjects. The individuals who participated in this study were 18 years and older. Questionnaires were given to 226 individuals, 116 were Americans and 110 were Koreans. Data collection was conducted between April 16-19, 1999 at the main campus of Pennsylvania State University, State College, Pennsylvania. If individuals agreed to participate, a two-page questionnaire written in English or Korean was given. These versions of the questionnaire were translated back and forth into English-Korean several times by the researchers (graduate students in the Leisure Studies Department). This approach was adopted to help reduce the use of idiomatic phrases open to multiple interpretations. To acquire a representative sample of the individuals, the variations in days and times (afternoon, evening, and night) were incorporated into the sampling plan.

Instrumentation. A self-administered questionnaire was developed by the researchers and included four sections. In the first section, respondents were asked to provide demographic information (gender, age, and marital status). In the second section, respondents were asked to provide their own definition of the term "leisure" in a word, phrase, or sentence. The third section collected more information regarding the definition. The leisure definition scale was adopted from an earlier study that was reported by Samdahl (1991) and Iso-Ahola (1979). Respondents utilized a seven-point Likert scale to rate their agreement/disagreement with each definitional item: 1=

strongly disagree to 7= strongly agree.

Analysis. Analysis consisted of four steps. First, descriptive statistics were used to profile the sample. Second, the 15 leisure definition statements were factor analyzed, using a varimax rotation procedure, to obtain reliability coefficients for delineated factors. In the third step, two groups of individuals—American individuals ($n = 116$; 51.3%) and Korean individuals ($n = 110$; 48.7%)—were formed as independent variables. The two independent variables were examined with respect to delineated leisure definition factor groupings and individual demographic information. A t-test was conducted to examine whether differences existed between the two independent variables (American and Korean). Also, t-test was used for continuous variable to examine the relationship between socio-demographic variables (gender, marital status, age) and four leisure definition dimensions. Finally, t-test was used to examine the relationship of nationality and socio-demographic characteristics to leisure definition. In addition, qualitative methods were employed to analyze the second section of the questionnaire: the open-ended questions.

Results

A total of 226 respondents comprise the sample for the analyses in this study. Socio-demographic data are presented in Table 1. The sample was unbalanced in terms of the gender groups (58.4% males and 41.6% females); about 62.8% of the respondents were single and 37.2% were married. The respondents ranged from 18-60 years in age; 41.4% were aged 18-22 and 58.6% were 23 and older.

Table 1. Socio-demographic Profile of Respondents

Characteristic Category		Number of People	Percentage
Nationality	American	116	51.3
	Korean	110	48.7
Sex	Males	132	41.4
	Females	94	58.6
Age	18 – 22	92	41.4
	23 and older	130	58.6
Marital Status	Single	142	62.8
	Married	84	37.2

A principle component analysis of 16 leisure definition items resulted in four factor groupings. Two items with less than .45 loading were removed from the study. The factors were labeled: 1) Activity, 2) Perceived freedom, 3) Affect, 4) Work relation. Labeling factors were based on the appropriateness of the individual items under each factor grouping and judgmental evaluation of the factors consistent with the literature (Samdahl, 1991). Combined, these four factor groupings accounted for almost 60.6 % of the leisure definition variance. Composite scores were obtained on each factor for every subject by calculating the

mean of the relevant item response scores. Cronbach's alpha was calculated for each factor to assess the reliability ranging from 0.83 (Affect) to 0.69 (Work relation).

Table 2 provides the results of the t-tests of the four delineated leisure definition factor groupings by the two different nationalities. The study reveals that significant differences exist between Koreans and Americans with respect to three factor groupings: Perceived freedom, Affect, and Work relation. Koreans are more likely than Americans to define leisure from the Perceived freedom

factor with a mean score of 6.46. On the other hand, Americans are more likely to perceive leisure as affect and

freedom from work than Koreans.

Table 2. T-test of the Relationship between Nationality and the Definition Dimensions

	Nationality	
	American	Korean
	mean	
Activity	5.49	5.38
Perceived freedom	5.16*	6.17*
Affect	5.63*	5.27*
Work relation	5.54*	4.71*
	df = 1, n=225	

*Significant at the .05 level or higher

According to the result of the T-test of the relationship between gender and dimensions of leisure definitions, no significant relationships were found. Then T-test procedure was employed to determine if a relationship existed between the four leisure definition dimensions and socio-demographic variables (age) (see table 3). It indicated that there was a significant relationship between

age and factor 2 (perceived freedom), factor 3 (affect), and factor 4 (Work Relation). On the other hand, there was no significant relation between age and factor 1(Activity). Older people are more likely to say leisure as perceived freedom while younger people are more likely to perceive leisure as affect and work relation than elders.

Table 3. T-test of the Relationship between Definition Dimensions and Age

	Age	
	18 - 22	23 and older
	mean	
Activity	5.54	5.39
Perceived freedom	5.16*	6.02*
Affect	5.66*	5.30*
Work relation	5.50*	4.80*
	df = 1, n=220	

*Significant at the .05 level or higher

According to the results of the t-test, a significant relationship was discovered between marital status and perceived freedom and work relation. Married people were

more likely to define leisure as Perceived freedom than single people did. On the other hand, married people were less likely to define leisure as work relation (see Table 4).

Table 4. T-test of the Relationship between marital Status and Definition Dimensions

	Marital Status	
	Single	Married
	mean	
Activity	5.46	5.40
Perceived freedom	5.33*	6.20*
Affect	5.54	5.30
Work relation	5.30*	4.75*
df = 1, n=225		

*Significant at the .01 level or higher

Discussion and Conclusion

The results revealed that there is a significant relationship between the concept of leisure and nationality. The results also support the existence of a relationship between demographics (age and marital status) and definition of leisure. For Americans, work relation and affect were more highly related to leisure. Perceived freedom was a better indicator for what leisure means to Koreans. Activity was not a strong indicator to explain the different concepts of leisure definition between the two nationalities

Limitation of this study could be the methodology employed. The survey instrument of this study was designed to compare the meaning of leisure between Americans and Koreans based on the definitional attributes of leisure. Since this study is based on a comparative analysis between two nationalities, the survey had to be translated into another language: Korean. Although we went through a trial-and-error correction process regarding the questionnaire translation, there is a possibility that the accurate meaning of questions might have degenerated.

The sample selection bias potentially allowed misrepresentation of the subjects' true characteristics or opinions. Koreans who have been selected for participation in the study were mostly students who have lived in the United States and have been exposed to western culture. If the sample were collected in Korea, it might have been more representative and might have yielded different results. Future research of leisure definitions across nationality is likely to be more beneficial if it includes more specific modification for each dimension and better operationalization.

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UNIVERSAL CAMPSITE DESIGN: AN OPPORTUNITY FOR ADAPTIVE MANAGEMENT

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Abstract: The basic design of campsites has changed little since the 1930s in Yosemite National Park. In heavily used areas, such as Yosemite Valley, this design is leading to environmental impacts from soil compaction, erosion, vegetation damage, and lack of regeneration for many plant species. These sites are also inaccessible to many people with physical disabilities.

In the spring of 1998, four campsite prototypes were installed in an effort mitigate some of these environmental impacts, as well as address accessibility issues for the physically disabled. Special features of these designs included: (1) a flat parking-campsite surface of crushed granite, (2) a clearly defined, permanent boundary for the campsites, (3) new designs for picnic tables, food storage lockers, and campfire rings.

These prototypes were evaluated using a survey questionnaire and systematic daily observations. The results indicate that the new designs are indeed an improvement. The value of evaluating design prototypes as an adaptive management tool is discussed and recommendations are suggested.

Introduction

The increasing popularity and changing nature of outdoor recreation is creating unprecedented management pressures. For instance, the growth in camping has increased from 13 million or 10 percent of the US population over the age of 12 in 1960, to 58.5 million or 29 percent of the population in 1995 (Cordell 1999:235). The pressure from this increase comes in two forms. First is the need to accommodate this increased demand for access, including access by those with disabilities. Second, resource managers, scientists and the public all agree upon the need to maintain healthy ecosystems and protect natural and cultural resources from unnecessary damage caused by overuse. These pressures are being felt throughout the country's outdoor recreation system, but are particularly acute in the nation's 'crown jewels', such as Yosemite National Park.

In response to diverse conflicts over natural resource use and protection, managers, scientists and the public are developing an approach to constructively address these problems called "adaptive management" (Shindler et al. 1999). Rather than implementing sweeping changes before they have been tested, managers are advocating smaller trial runs that can be evaluated before making large commitments that are difficult to change. "Adaptive management is an approach ... that imbeds a simple imperative: policies are experiments; learn from them" (Lee 1993:9). While traditional researchers are accused of never having studied any issues sufficiently to make a decision, the attitude of adaptive managers is quite different. "The adaptive approach favors action, since experience is the key to learning" (Lee 1993:63). Actions implemented at a manageable scale create the opportunities to learn and make better decisions.

The use of "small experiments" is also advocated by Kaplan (1996) as a way to bring useful information to bear on local planning and design decisions. Her approach is very similar to adaptive management: "Small experiments provide ways to try things out. They are unabashedly imperfect. They are 'small' in cost, in number of participants involved, and especially in their intention" (Kaplan 1996:170). She offers succinct advice about four attributes of successful small experiments. First, do not skimp on conceptualization, or "thinking through what one hopes to learn." Second, "while sampling may be an important issue, it may not deserve all the emphasis it has received. A well-conceived study can yield useful results even if it is based on a nonrandom sample." Third, keep track of pertinent information, look for convergent results from different sources (e.g., surveys, observations, interviews), and avoid "the temptation to add questions to a survey 'while one is at it'." Finally, pay attention to effective dissemination and "be mindful of the intended audience." Research of all types can be made ineffectual because it is communicated in the wrong way or to the wrong audience.

This paper summarizes our experience applying some of the principles of "adaptive management" and "small experiments" to the redesign of campsites for Yosemite National Park.

The Situation in Yosemite Valley

Yosemite National Park (YNP) receives over four million visitors a year, making management of the 1200 square mile area a challenge. YNP is also the host to nearly 200,000 overnight campers on an annual basis at 13 campgrounds throughout the park. The high demand for access to recreational camping in YNP requires increased emphasis on campground management in order to meet the mandate for resource protection and visitor enjoyment. The majority of visitation to the park is concentrated in Yosemite Valley (YV). There are currently three drive-in campgrounds in YV: Lower Pines, Upper Pines, and North Pines. They contain 441 campsites and provided overnight camping to approximately 30,460 individuals during the 1998 season. Camp 4 (a walk-in campground) has a

capacity of 210 people a night. The number of campsites was greater before the 1997 flood and the future number of campsites is under consideration as part of the YV Plan. Such large numbers of people concentrated in an area for extended periods of time can lead to undesirable impacts. In the YV campgrounds these include: vegetation damage, soil compaction, erosion, and stream bank failures.

The existing campgrounds in YV were designed in the 1930s and are inadequate for protecting resources while accommodating this number of modern campers. It was thought that universal campsite design might be appropriate for addressing some of these problems (Hultsman et al. 1998; PLAE 1993). Universal campsites were originally designed to provide full site access to people with disabilities. The Americans with Disabilities Act (ADA) of 1990 requires that public places be as accessible to people with disabilities as they are to those without disabilities. Universal campsites also provide clearly defined boundaries that help contain camper activities. This decreases widespread impacts on natural and cultural resources beyond the campsite area. It is also thought that all campers would appreciate that the universal design provides adequate space for a large variety of vehicles and equipment, and flexibility in how individuals arrange their campsite.

A Small Experiment

To replace the existing campsites with a universal design will create a significant disruption for visitors during the construction period and require a major commitment of resources by YNP. Before embarking on such a large project, it was decided to install four prototype campsites and evaluate them as a "small experiment." These campsites were constructed in a very wet area of the Lower Pines campground during the spring of 1998. Some of the design objectives were to, (1) provide a site surface, furniture, and arrangement accessible to more potential campers, including those with disabilities, (2) provide a well drained and dust-free surface that provides flexibility for individual needs, equipment and activities, (3) minimize resource damage around and between sites, limit the amount of sprawl and trampling outside the site, and allow for the reestablishment of herbaceous vegetation and regeneration of canopy trees, and (4) test a variety of edging materials and campsite furniture to determine the functionality and camper preferences.

The universal campsites were constructed in the late-spring and early summer. The heavy spring runoff from the Merced River caused campsites near the river to be inundated with water. The new universal campsites were used as emergency sites for campers who held reservations at sites that could not be used because of their wet condition. After July 15 the universal sites were placed in the reservation system.

Two methods were employed to gather data about these prototypes, a camper survey and observation of the campsites' condition. Survey questionnaires were distributed between June 12 and October 26, 1998.

Surveys were given to campers by NPS rangers or volunteers when they checked into their site. The prototype sites were occupied by 307 groups during their first season. A total of 90 completed questionnaires were returned to the campground kiosk. It is estimated that approximately 20% of the groups did not receive questionnaires. For instance, some campers arrived late at night and left before a ranger could offer them a questionnaire. The responses represent approximately 35% of the groups believed to have received a questionnaire.

In addition, a ranger monitored the prototype and neighboring campsites. A simple observation worksheet was used to evaluate and record the condition of each site. Most of the observations could be made from the campground road, and an effort was made not to disturb campers. A total of 169 groups of campers were observed between July 15 and October 26, 1998.

Campsite Design

Existing campsites. YV campsites, like the one in figure 1, have asphalt-parking areas (spurs) bounded with concrete half-rounds that have the appearance of half-buried logs. Campers park their vehicles and RVs (recreational vehicles) on the spur. The campsites are in mixed oak-conifer woodland. The understory is sparsely vegetated with dogwood, but younger age classes are notably absent. The majority of the campground surface consists of bare ground, which is often covered with pine needles.

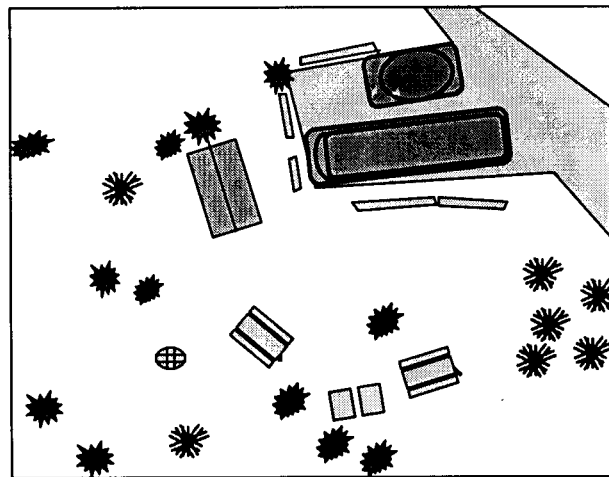


Figure 1. This schematic plan of the existing campsite 11 shows parking on the paved spur is crowded, the camping area has no boundaries, and the site furniture is not ADA accessible.

The provided furnishings stay fairly constant: a 4' x 3' x 2' metal food storage locker, a non-accessible campfire ring (1' x 32" diameter) with a flip grill, and a non-accessible steel frame wooden picnic table (6' x 29" table top) chained in place. "Accessible" refers to usability by persons with disabilities. Campers place their non-vehicular equipment on the bare ground. Examples of the types of equipment

placed on the dirt include tents, dining flies, chairs, tables, and bicycles.

There are no clearly defined boundaries to the existing campsites. Sometimes the wear on the campsite indicates a tentative boundary. Signs are occasionally posted on the edge of the campsite in an attempt to limit the amount of camper sprawl and resource impact.

Prototype campsites. The general characteristics of the prototype universal campsites are summarized in Table 1. In contrast to the existing campsites, these campsites have an area bounded by an edging material. The area of the campsite is well defined in order to limit the sprawl around the campsite. Three different edging materials were tested: rectangular concrete curbing, granite coping, and peeled log rounds.

The surface of the campsite is 4" of compacted crushed stone (3/8" screen) over an 8" aggregate base (3/4" screen). This material is graded at 2% and provides a well-drained campsite that is not muddy when wet. The surface also reduces dust when dry. This surface provides the desirable level, firm, stable, slip-resistant surface that allows access for people with disabilities. After mid-summer, pine needles were scattered over the crushed stone to provide a look more reminiscent of the forest floor.

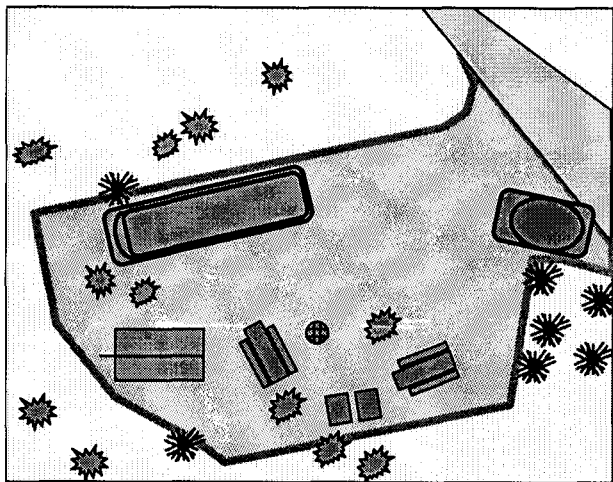


Figure 2. This schematic plan of the universal design for campsite 11 shows that the camping area is a well drained crushed granite surface with clear boundaries, vehicles can park anywhere on this surface, and the site furniture is ADA accessible.

The provided furnishings included food storage lockers, picnic tables, and fire grills. The steel food storage lockers (4' x 3' x 2') were the same those used on the existing campsites. A new larger concrete food storage locker with steel doors was also tested.

Two types of accessible picnic tables were tested. One had a steel frame and a wooden top (8' x 2.5') with a 2.5' overhang at one end to allow wheel chair accessibility. Campers could move this picnic table, allowing greater flexibility in site arrangement. The second picnic table had

brown concrete supports and a top of cast brown wood-textured concrete (8' x 2.7') plastic topped concrete seats. The concrete picnic table has a 2' overhang on both ends to allow wheel chair accessibility. The concrete picnic table was not movable.

Three fire grills were evaluated: An older design with a flip-top grill over a ground-level concrete pad, an accessible metal campfire ring (15" high x 32" diameter) with an adjustable flip grill, and a waist high accessible concrete picnic grill not designed for campfires.

Table 1. Characteristics of prototype campsites.

	Campsite			
	6	8	10	11
Area (sq. ft.)	1488	1870	2376	2120
Max. group size	6	6	12	10
Camp edging:				
Concrete	X	X		
Granite				X
Peeled log			X	
Food locker:				
Metal	1	1	2	2
Concrete	1#			
Picnic table:				
Metal/wood		1	2	2
Concrete/plastic	1			
Camp grill:				
Old flip-up grill		1*	2*	2*
ADA fire ring		1	2	2
ADA picnic grill	1			

Notes: * Old grills were replaced June 28. # A metal locker replaced the concrete one August 17.

The campers were instructed to place all their vehicles, RVs, tents, and other equipment within the defined campsite boundaries. The campsite area defined by the edge tends to be smaller than the average area of the existing adjacent campsites with the same visitor use limits. The entire surface of the universal campsite is crushed aggregate; vehicles, RVs, tents, and other equipment could be placed anywhere on the site.

What We Learned

Who are the campers? The campers came primarily from California (57%), but they also represented other Western states (10%), other parts of the US (13%), and Europe (18%). The average group size for campsite 6 was 3.7 people, for site 8 it was 4.1, for site 10 it was 7.3, and for site 11 it was 6.4 people. They were mostly tent campers (54%), but a significant number brought RVs (22%) or used both tents and RVs (24%). Only 4 of the 90 responding groups reserved one of these prototype sites because it was accessible to persons with a disability. Six groups reported having at least one member with a disability.

What accommodations did they bring? Every group brought some sort of vehicle and some brought more than one, as summarized in Table 2. Almost a third of the groups brought a passenger only vehicle. Almost a quarter

brought a RV intended to accommodate sleeping. A large number also brought a van or camper-truck, but it was uncertain whether they intended to sleep in these vehicles.

Table 2. Type of vehicles brought.

Type of vehicle	Percent
Motor home	17.2
Camper trailer	4.6
Tent trailer	1.1
Van/Camper-truck	28.7
Car/Truck/SUV	63.3
Other	3.4

n = 87. Some groups had multiple vehicles.

A major change in camping during the past 30 or so years has been the increasing popularity of large RVs in campgrounds. In this study almost half of the groups had some sort of RV. The design changes required for a tent campsite to accommodate large RVs can be substantial--the primary problem is their size. A typical family sedan may be 15 to 18 feet long, while RVs are often twice this length. Table 3 gives the reported distribution of RV sizes.

Table 3. Size of motor home or RV trailer.

Size of RV (ft.)	Percent
18-21	20.0
21-24	25.0
24-27	40.0
27-35	25.0
35-40	5.0

n = 17. Some groups had multiple RVs.

Tents are still the most common form of camping accommodation, being used by 78% of the groups. Both smaller tents and larger family tents are popular. The percent of groups using tents of these sizes are shown in Table 4.

Table 4. Size of tents.

Tent size (ft.)	Percent
< 9' x 12'	71.2
> 9' x 12'	47.0

n = 66. Some groups had multiple tents.

How did they like the prototype sites? The overall reaction to the prototype campsites was very positive -- 34% thought they were excellent, 52% good, 8% adequate, and 6% poor. The overall mean rating was 1.85 (1 = excellent, 2 = good, 3 = adequate, 4 = poor). The ratings for the several alternative attributes of the prototype campsites and tests for the significance of their differences are given in Table 5.

The crushed rock surface was rated excellent or good by almost 60% of the respondents. The surface material fulfilled the design specifications -- throughout the summer these sites were never muddy or dusty. The surface accommodated most types of vehicles and tents, and never showed tire impressions. However, some comments were received indicating that the surface was too hard or that it appeared constructed rather than natural. Distributing pine needles over the sites was an attempt to

respond to the psychological reaction to a crushed granite appearance. This experiment did not improve ratings; to the contrary, they dropped slightly. It was interesting that in a couple of instances groups were observed sweeping all the pine needles to one side, apparently in an effort to keep the site "neat and clean." Positive responses were highest for RV users (87% excellent or good) and lower for tent campers (50% excellent or good) and people with both tents and RVs (45% excellent or good).

Both the new concrete and traditional metal food storage lockers received very high ratings by the campers. Unfortunately, the concrete locker turned out not to be bear-proof. The first bear break-in occurred August 3, apparently because the locker was not properly latched. On August 15 it was broken into a second time, serving testimonial to the resourcefulness of YV bears! Experience has taught YNP rangers to respect bear ingenuity, so the concrete lockers were replaced by the proven metal locker design.

Table 5. Ratings of campsite attributes.

Attribute	n	$\bar{X}$	F-test
Surface material:			
Crushed granite	41	2.23	$F = 0.43$
Pine needle duff	46	2.39	$p = .515$
Food locker:			
Concrete	16	1.44	$F = 0.04$
Metal	74	1.39	$p = .833$
Picnic table:			
Concrete/plastic	21	1.29	$F = 0.62$
Metal/wood	68	1.43	$p = .435$
Camp grill:			
Old flip-up grill	7	2.71	$F = 4.20$
ADA fire ring	60	1.62	$p = .018$
ADA picnic grill	17	1.94	

Ratings: 1 = excellent, 2 = good, 3 = adequate, 4 = poor.

Both types of picnic tables were also highly rated. While one feature of the lighter metal and wood tables was that they could be moved around the site, there was also the possibility of abusing this flexibility. However, no group was observed placing their table outside the campsite boundary.

Campfires are an important part of the camping experience for many people. In VY, fires are only permitted in the provided camp grills. The old style flip-up grate over a concrete base was judged as adequate, but significantly less desirable than the new ADA compliant fire rings. The new ADA picnic grill was also rated as good, though it was not suitable for 'campfires.'

The theme of cooking and campfires was explored further. Table 6 shows that over 80% of the groups used equipment they brought with them for cooking, so the provided campfire grills are not usually necessary for cooking. On the other hand, the campfire grills are popular for campfires. It was hoped that campers would be amenable to sharing campfires with another campsite, since campfires in intensively used areas such as YV can cause

management problems. When asked, 45% of campers responded with a flat-out "No," while the rest indicated some willingness to give it a try.

Table 6. Cooking equipment brought.

Type cooking equipment	Percent
None/no answer	19.1
Own BBQ grill	21.4
RV stove	5.7
Camp stove	68.6

n = 89. Some groups had multiple equipment.

Is the campsite boundary respected? The new universal design establishes clear campsite and path boundaries in an effort to contain human activities to areas designed to withstand their impact. One of the purposes of observing the campsites was to determine whether activities were being restricted to within the clearly bounded areas. Table 7 reports the percent of times a ranger observed an indication that human activity was not being contained, or that it was damaging the surrounding natural resources.

Only 11% of the groups were observed placing equipment outside the campsite boundaries, and equipment brought by 12% of the groups was observed to have potential impacts on resources. This included hanging equipment in trees or placing equipment on ground cover. The results from the survey are similar, where 13% of the groups indicated they did not have adequate space. In contrast, the rangers only observed a couple of instances (1%) where a group appeared to have insufficient space.

There were several observed indicators that campers were impacting areas beyond the defined site. Ropes were observed strung to trees beyond the edge of the site for 11% of the groups. People were also observed walking outside their campsite's border (8%), using unofficial trails (7%), and cutting through another campsite (6%). When one thinks about the large population of campers using YV, these numbers could result in substantial negative impacts. In contrast, observations of older existing sites in the same campground indicate that these problems are approximately twice as common there.

Table 7. Campsites with observed problems.

Problem	Percent
Equipment placed off-site	11.2
Equip. potentially damaging resource	12.4
Ropes strung to trees off-site	10.7
See walking outside boundary	8.3
See social (unofficial) trail use	6.5
See cutting through campsite	5.9
Insufficient room on site	1.2

n = 169.

Conclusions

This modest evaluation of four prototype campsites indicates that the universal design approach meets both campers' needs and helps protect the surrounding resources. Equipment assessments were successful in determining types of ADA campsite furniture for future

use. The Yosemite prototype campsites best meet the needs of people with disabilities and visitors with recreational vehicles (RV). The universal campsite design is recommended for future use by adapting its form and function to the site conditions, range of access needed (e.g., ADA compliance), the types of suitable edging and surface materials available, and the shape and size requirements. In order for the universal design to be successful in protecting resources, campsite design must be incorporated into the entire circulation system for vehicles and pedestrians throughout the campground. This will alleviate impacts to resources from short-cutting caused by inadequately designated trails, poor way-finding, and off-pavement parking. Campsite screening through revegetation is also needed to provide a sense of campsite boundary, noise reduction, shade, and enhanced visitor experience through connection to the natural environment. In the spirit of adaptive management, the effectiveness of future changes should also be monitored.

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A LIFE TO RISK: CULTURAL DIFFERENCES IN MOTIVATIONS TO CLIMB AMONG ELITE MALE MOUNTAINEERS

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Abstract: This study explored the cultural differences and motivations to climb of elite, male mountaineers. The purpose of the study was to first determine the motivations of elite male mountaineers and then link these motivations to the culture in which the mountaineer lives or grew up in. Five co-researchers participated in the study: two Canadians, two Americans, and one from the United Kingdom. To understand the co-researchers' motivations, culture, risk perceptions and cultural perceptions, a standardised survey was sent out containing fifteen open and closed ended questions. The survey was qualitative in manner and achieved a greater understanding of the climbers' knowledge and opinions about motivations, risk and global culture. Through a thematic analysis of survey results, various common themes emerged. Discussion of co-researchers' common themes regarding risk, motivation and culture allowed for a variety of findings, including: mountaineering because you are good at mountaineering, mountaineering to go places, enjoying the hard work, having barriers of physical difficulty and time, overcoming such barriers through persistence, managing risk to reduce it, being sensitive to mountain cultures and being aware of economically dis-advantaged cultures that have little time for recreation. Overall, this study found little connection between a mountaineer's culture and his motivations, perhaps due to the similarity of the co-researchers' cultures.

Introduction

This research project exposed and examined the cultural motivational differences of elite male mountaineers to climb and determined which of the differences and commonalities in motivation were based on cultural background. To accomplish this, a survey of 15 open-ended questions was mailed in May, 1999 to 17 elite male mountaineers from five countries (Canada, the USA, the United Kingdom, Russia and Austria). These mountaineers were assessed as elite through sponsor and national mountaineering organisation assistance.

A thematic analysis of the collected data from the five respondents from three countries (response rate of 29.4%) uncovered numerous themes showing congruence across the three respondent cultures (Canada, the USA and the

United Kingdom) and led to some interesting conclusions. Emerging themes were drawn from the data and compared across the five participants to create clusters of common themes. These common themes were then closely analysed and are discussed in the following pages

Significance

Past researchers have often touched on the topic of cultural differences in mountaineering motivations and mountaineers in general, but to date no in-depth research on the topic has been found. Perhaps this research can, in the wake of recent tragedies, such as those on Everest (Boukreev & DeWalt, 1997), explain why a Russian mountaineers are often misunderstood, or why Western mountaineers will often shun their principles for money or fame. Through this study, it is hoped that certain cultures can come to realisations, or at least recognise how their overall attitudes can affect the mountaineering community.

This study also has significance in opening new perspectives towards the lifestyles of mountaineering and what mountains mean to mountaineers. A glimpse into the understanding of the mountaineering sub-culture and mountaineering's place in various cultures is also discussed by this study.

Previous Research

Williams and Donnelly (1985) provide what is likely the best look into the sub-culture and transformation of climbing among western society. The authors provide a glimpse into the similar social backgrounds and values of climbers, thus showing a place for the examination of social differences, and from there, cultural differences.

Research by Rossi and Cereatti (1993) used Zuckerman's scale of sensation seeking to observe many categories of mountain athletes. Findings showed that cavers generally show the same quest for uncertainty as mountaineers, which may be attributed to the periods solitude and intensity associated with these activities (Rossi & Cereatti, 1993). Furthermore, the study investigated the specific activities of mountaineers from various nationalities; the authors note differences in activity preferences by culture.

Ewert (1985) provides strong insight into why people climb based on his study of participant motives and experience level with regards to mountaineering. He also evaluates the underlying motives of mountaineers, which create the need to invade a hostile environment, the mountains. The focus of motivation appears to stem from the anticipated benefits of risking life and limb whether it be in the mountains or elsewhere (Ewert, 1985). Ewert's (1985) study indicates that experienced mountaineers are less interested in external motivations, and more motivated by personal testing and developing an internal locus of control. In 1994, Ewert extended his research on motivation and risk taking by moving into a high altitude environment on Denali. Study results proved to be somewhat inconclusive with regards to risk playing a role in mountaineering motivation (Ewert, 1994).

Breivik (1996) researched risk taking behaviours among Everest climbers on a Norwegian Everest expedition. From the study a relationship between sensation seeking, as categorised by Zuckerman (1979), and risk taking appeared with relation to reaching goals. Within his results, Breivik (1996) compared his findings with those of other studies that took place in the past on mountains such as K2. Breivik (1996) found the Norwegian subjects to score in the tough-minded, independent, low anxiety category along with Czechoslovakian elite climbers. In direct contrast, were English elite climbers and the Italian K2 expedition members scoring as more introverted, sensitive and more tense.

Bratton, Kinnear, and Koroluk (1979) observed the specific sector of the Canadian Alpine Club-Calgary Section for their research project. To Bratton et al. (1979) the conclusion is almost assumed, "there can be little doubt that many forms of mountaineering border on the ultimate in stress seeking" (p. 23). It appears from the research presented, that elite athletes look more to the risk factor, where as novices look to the exercise and relaxation aspects (Bratton et al., 1979).

From the studies cited above, a critical gap in the research on mountaineers becomes apparent. Mountaineering is highly researched, as is motivation and risk; the missing link is a specific study on culture, a study that brings the aforementioned concepts together. This study attempts to contribute to all the areas of mountaineering, motivation, risk, and culture, and specifically tie together the question of whether there are cultural differences in motivations of elite male mountaineers to climb.

Research Findings and Discussion

To understand the results of the study a brief introduction to the participants is imperative. Each of the five respondents has over 15 years of personal mountaineering experience. Two of the respondents were from Canada, two from the USA and one from the United Kingdom. Some have summited on all seven continents, others have led expeditions from the Himalayas to Antarctica, some have made highly acclaimed first ascents, while others have guided clients on peaks from Argentina to Alaska.

A common theme is defined in this study as one that emerged from three of the five respondents. Particular attention was paid to those common themes which, were backed by either both American or both Canadian respondents. Verification of a common theme by both respondents of a culture showed cultural significance rather than just individual opinion and allowed for a more in-depth analysis. Due to study participation, no cultural verification could take place for the culture of the United Kingdom, as there was only one respondent. The following section interprets and provides a meaningful discussion on each common theme. The co-researchers who expressed a common opinion are analysed and any vastly different or interesting opinions are exposed.

Clusters of Common Themes

- 1) Mountaineering Motivations
 - a) good at mountaineering (1 Canada, 1 USA, 1UK)
 - b) going places-exploring the outdoors (1 Canada, 1 USA, 1UK)
 - c) exercise/hard work (1 Canada, 1 USA, 1UK)
 - d) inner love, being alive (1 Canada, 1 USA, 1UK)
- 2) Mountaineering Barriers
 - a) physical difficulty (2 Canada, 1 USA)
 - b) psychological/time (2 Canada, 1 USA, 1 UK)
- 3) Overcoming Barriers
 - a) persistence (2 Canada, 1 USA)
- 4) Risk
 - a) manage risk to reduce it (1 Canada, 2 USA)
- 5) Cultural Thoughts
 - a) mountain cultures are more supportive (1 Canada, 1 USA, 1UK)
 - b) cultures with less economic advantage have little time for recreation (1 Canada, 1 USA, 1UK)

Mountaineering Motivations

As stated by Bratton, Kinnear & Koroluk (1979), mountaineering, in essence, is the deliberate intrusion into a dangerous, but beautiful setting. The motivations for such a journey, as determined by previous studies, makes a list of great length. For mountaineering motivations, common themes were found to be: good at mountaineering, going places-exploring the outdoors, exercise/hard work and an inner love, being alive.

Good at mountaineering

Achieving a high level of success at any activity brings about positive reinforcement to continue pushing ones limits and continue in that activity. Mountaineering is no different in this sense; if a mountaineer is good they will likely continue to enter the mountains. One Canadian described himself; "I am a mountaineer because I am a failure as a hockey player". An American respondent likened being good at mountaineering to his hatred of team sports, in particular the US national sport of baseball. Becoming good at an activity through one's own hard work tends to drive a participant to continue, but when this high level of achievement is forced, being "good" can push someone away from an activity. Three respondents stated that they mountaineer because they are good at it or have become respected because of it. Tied into this is the fact that they all have financial interests in being good at mountaineering; their personal income dictates that they are good at their chosen profession, mountaineering.

Going places-exploring the outdoors

All the co-researchers enjoy travelling the world in search of new mountaineering challenges. There is, however, some difference between travelling simply to climb a peak and travelling out of love for exploring. Leaving their

homes for the high altitude wilderness never loses its draw or effects on them. A mountaineer from each culture placed going places and exploring as a mountaineering motivation. One Canadian respondent stated that his love comes from "going to beautiful places and moving around in an exotic environment". Developed mountains will push one American respondent away and for the lone British co-researcher, travelling appears to be a natural progression, which simply came with moving up his personal climbing ladder.

Exercise/hard work

Exercise and hard work have always been a part of global culture. In the past, the affluent enjoyed being physically active, while for the poor labour class this meant hard work for the benefit of the wealthy. Today, among the western world, exercise is highly valued, while the hard work ethic appears to be losing ground in the west. For the third world hard work is still the basis of the economy.

Every culture studied expressed the need to exercise and hard work as a motivation for mountaineering. For one Canadian the hard work involved in mountaineering was at first a barrier to participation, but as time went on the pain left and the beauty of the exercise in a beautiful environment remained. The pain of backpacks held a US respondent back as well, but the joy of feeling his body move over rugged terrain prevailed. In being able to mountaineer the British respondent had to engage with natural and real challenges, while also working hard in the politics and regulations associated with Himalayan mountaineering. As a preamble to every expedition, one respondent stated that he must "train like hell... to prepare mentally and physically".

Inner love, being alive

An inner love of the mountains is a difficult theme to explain because each individual's inner love is a separate entity. As one American indicated, he feels a need for climbing-mountaineering: an inner love of the mountains, travel and adventure. The British inner love seems to come from being alive and free in an inspiring environment; such an environment could not hold such inspiration without comfort. To a novice mountaineer the environment would appear dangerous, not that it isn't, but to the elite the mountains inspire the inner child.

Mountaineering Barriers

In any activity there are barriers to participation and success. What makes a participant strive is the ability to overcome such barriers. Mountaineering barriers are varied due to the unpredictable nature of the sport. For the co-researchers of this study, two barriers appeared common among the myriad of others, those of physical difficulty and psychological/time.

Physical difficulty

Physical difficulty can include many factors such as injury, illness, disability, training regime or stature. Difficulty, although a barrier, results in a challenge or an object for which a solution must be found. Difficulty can result in a

driving force for some individuals to continue, for without difficulty there would be no motivation. Three respondents indicated physical difficulty as a barrier to be overcome, in fact one went so far as to say that he is "a skinny weakling"; an interesting comment from such an accomplished mountaineer. For all three mountaineers who found physical difficulty a barrier it was overcome with time, either by simply dealing with it as a fact of mountaineering or by becoming stronger.

Psychological/time

Psychological barriers are often the most difficult barriers to overcome. Unlike physical barriers, which mostly heal with time and rest, psychological barriers often shake a person so deeply that to face a particular barrier takes an enormous amount of courage. Psychological barriers can take many faces such as: fear and the thought of death, but also time. Time, as a psychological barrier to mountaineering, can become overwhelming. Lack of time during an expedition can create excessive pressure to push on and put oneself in dangerous situations.

Psychological barriers became common through the responses of four co-researchers. Again the thought of being "a skinny weakling" is a psychological barrier. In some situations these thoughts may have held a person from attempting aspects of mountaineering. For the British respondent, the primary psychological barrier was time with regards to being able to find funds for an expedition or be on an expedition for such a long period of time. Time as a barrier, appeared for one Canadian, in terms of the time it takes to grow strong and learn the ways of a mountaineer. This psychological barrier of time is directly tied to physical difficulty.

Overcoming Barriers

To overcome barriers which prevent a person from succeeding are often the strongest motivators and allow for tremendous feelings of achievement and self worth. However, often these barriers continue to plague a person and, in many cases, may never be overcome. Overcoming barriers in this study of mountaineering included themes such as training like hell and personal rewards. Among three of five co-researchers a common theme for overcoming barriers materialised as persistence.

Persistence

Persistence is the ability to be pushed down and then get up again to continue. Persistence could be to overcome physical injury with the will to move on or persistence could be getting hit with bad weather and waiting out the storm. In any case, persistence pays off. Of the co-researchers, three expressed persistence as a common theme when overcoming barriers to their mountaineering careers. As mentioned by both Canadian co-researchers, persistence could be seen as a trait of Canadian mountaineering and culture. Persistence is essentially what may cause one Canadian to train like hell to prepare for an expedition even though he is a self proclaimed "skinny weakling". For the other the long road to success through physical and mental growth can be seen as persistence. For

one of the American respondents, motivation was simply stated as persistence; persistence to reach personal rewards in climbing has driven him to 33 expeditions thus far, created a successful retail and guiding business and also allowed a lifestyle where, "after one trip I plan the next".

Risk

Mountaineering is full of risk both perceived and real, human and environmental, objective and subjective. Strategies to control or avoid risk are many and varied. Each culture and individual has their own way of coping, minimising or dealing with risk. For the co-researchers of this study, managing risk to reduce it was the only common theme.

Manage risk to reduce it

To manage risk is to first identify it and then seek to minimise identified aspects. There is little doubt that risk is a primary draw for mountaineers. Some mountaineers wish to deny the aspect while for others it provides the adrenaline to push the limits of the sport. Risk gone wrong spells disaster when not properly managed. All who identified managing risk as a common theme are guides who must constantly be on the lookout for risks, which may put their unwary clients at risk. An interesting point of view came out of this theme in that the British respondent was the only one to talk about how no peak is worth a life. He stated his primary thought on risk as avoiding risking his life.

Cultural Thoughts

As part of this study each mountaineer was asked to identify their culture, but also give some reflection as to what their culture offered to their mountaineering lifestyle. Their personal cultural reflection proved unsuccessful in creating common themes; however, the common themes of mountain cultures as being more supportive of their mountaineers and cultures who are economically disadvantaged having little time for recreation were exposed.

Mountain cultures are more supportive

In most mountain cultures, mountains are a large portion of the surrounding landscape and are explored and examined from any early age. Mountains to an outsider strike a chord because they are immense and imposing. Mountain cultures are completely immersed in the mountains from birth and, thus, the phenomenon of exploring the mountains tends to seem tame by most standards. Culturally, among co-researchers, one Canadian, one American and the only British co-researcher expressed this common theme.

Cultures with economic disadvantage have little time for recreation

Cultures with greater economic advantage have the money and leisure time available for mountaineering, but what about those cultures struggling to meet basic needs? As expressed by Maslow (1970), it is difficult for a person to worry about being self-actualized and seeking nature's beauty and their inner self if their basic needs of food, water and shelter are not being met. Are there many

mountaineers from third world countries? The answer is sadly, no. Mountaineering, due to its costs for equipment and travel, are thus restricted to mostly first world nations.

Of the five co-researchers, three supported and expressed the statement that cultures with less economic advantage have little time for recreation. These three are all from different cultures, but each are from first world countries and have mountaineering experience in third world countries.

Implications for Professional Practice

In addition to the significance of the research conducted there are several other points or implications which make such research important to professional practice. As expressed above, the motivations of a culture to climb or face risk may give an indication of why an action may occur or if an action could occur. In looking at elite mountaineers, the participants are in small numbers against the general populous of mountaineers, but do provide significant influence. For example, it is these elite mountaineers who often serve as role models or inspiration to the majority of other mountaineers. The elite sub-population of mountaineers serves as opinion leaders and thus, managers of mountainous national parks or protected areas could learn about the motivation of their users based on similar research.

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OUTDOOR RECREATION BEHAVIORS AND PREFERENCES OF URBAN RACIAL/ETHNIC GROUPS: AN EXAMPLE FROM THE CHICAGO AREA

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Abstract: A study of outdoor recreation preferences and behavior of Non-Hispanic White Americans (n=618), African Americans (n=647), and Hispanic Americans (n=346) in Cook County, Illinois was conducted in early 1999. Respondents were contacted in a phone survey using random digit dialing and a quota for each group. Important similarities and differences were found among these three groups in their participation in 43 activities and use of 20 places. In addition, gender, age, education, income, residence, and household size helped explain outdoor recreation preferences and behavior. Results reported here reinforce the need to avoid stereotyping particular groups or using simple explanations of their outdoor recreation behavior.

Introduction

With increasing racial/ethnic diversity of the U.S. population, researchers continue to work to identify the outdoor recreation preferences and behaviors of racial/ethnic groups. This research in turn helps resource managers to better meet the needs of their diverse customers. One limitation of past studies on this topic has been that they have often relied on data gathered for other purposes. The result has been small sample sizes and limited information on which to base the analyses (For example, see Dwyer 1992, Dwyer 1993, Dwyer 1994, Dwyer and Gobster 1992, Dwyer and Hutchison 1990).

We set out to break with this pattern by intentionally oversampling particular racial/ethnic groups in order to obtain a large enough sample of respondents to make statistically valid statements about their outdoor recreation preferences and behaviors. This oversampling technique was achieved by using a quota sample of residents of Cook County, Illinois which includes the city of Chicago. Due to space limitations in the proceedings, this article focuses on presenting descriptive data on the groups' recreation preferences and behaviors and only takes a first step toward making more in depth interpretations and recommendations. Additional information is available from the authors and will also appear in forthcoming publications.

The Sample

We wanted to sample urban Whites (non-Hispanic), African Americans, Hispanic Americans, and Asian Americans from the general population using a brief telephone survey that would focus on participation in a wide range of outdoor recreation activities and use of a number of diverse places. We chose this over an on-site survey since we wanted to learn about both participants and non-participants. Obtaining a representative sample of Asian Americans proved to be a major challenge because of their small numbers in the general population. Therefore, in this study we ended up not including a quota for Asian Americans. The Hispanic sample was difficult to obtain, even with Spanish speaking interviewers. Getting respondents from each group would have been easier if we were willing to target our sampling on neighborhoods where particular groups were concentrated. We chose not to do this in light of past research results suggesting that individuals who live in neighborhoods where a single group predominates have different recreation preferences and behavior than those who live in more diverse neighborhoods (Klobus-Edwards 1981). We decided to focus on Cook County, which includes Chicago (3 million residents) and its nearby suburbs (2.5 million residents) because of its diverse population. We used random digit dialing with a quota for each racial/ethnic group. Heads of households were surveyed, alternating between males and females. Our sample targets were 600 Whites (non-Hispanic), 600 African Americans, and 300 Hispanic Americans. Our final sample included 618 Whites, 647 African Americans, and 346 Hispanic Americans.

The Survey Instrument

The survey instrument was patterned closely after the Illinois SCORP (Statewide Comprehensive Outdoor Recreation Participation) Survey that is conducted every few years by the Illinois Department of Natural Resources, and which we have used for previous analyses (such as Dwyer 1992, Dwyer 1993, Dwyer 1994, Dwyer 1995, Dwyer 1996, Dwyer 2000, Dwyer and Gobster 1992, and Dwyer and Hutchison 1990).

Respondents were first asked about their participation in 43 different activities using the question, "In the past 12 months, did you go ...?" We asked, "When you go to a public outdoor recreation area in Illinois, (including city, county, state, federal parks and forests) with whom do you usually go?" Seven response categories were provided. Respondents were asked about 19 site attributes through the question, "In order to plan for all kinds of public outdoor recreation areas in Illinois in the future, how important is it to you that a public outdoor recreation area you visit (READ ATTRIBUTE -- e.g., "is safe from crime")?... Would you say very important, somewhat important, or not important?"

We asked the level of naturalness (i.e., lack of development) people preferred for outdoor recreation with the question, "Which one of the following statements most closely describes why you use public outdoor recreation

areas in Illinois?" Four response options were read to respondents. Importance of outdoor recreation was determined with the question, "In general, how important to your everyday life are outdoor recreation opportunities ... would you say very important, somewhat important, not too important, or not at all important?"

Finally we asked respondents where they went for outdoor recreation. In one question we asked, "In the past 12 months, about how many times would you say you went to public outdoor recreation areas outside Illinois?" Following this we asked about whether or not people had visited each of 20 different places located in Chicago, Cook County, surrounding counties, and the Shawnee National Forest in Southern Illinois. Basic demographic information gathered included race/ethnicity, zip code, age, gender, income level, education level, and number of people in the household.

Demographic Differences Across Racial/Ethnic Groups in the Sample

There were significant differences among the samples for the three racial/ethnic groups in the following characteristics: gender, age, location of residence, education, income, and household size. African Americans had the highest proportion of females interviewed (62%), followed by Hispanics (58%), and Whites (54%). A chi-square test indicated the proportions were significantly different for the various groups ($p < .05$). Mean age for respondents was lowest for Hispanics, while Whites had the highest ages on average (Table 1). Individual respondents were assigned to one of five areas in Chicago and Cook County based on their zip code (Table 2). Whites predominated in the northern suburbs and to a lesser extent in the southern suburbs and northern Chicago. African Americans heavily predominated in the southern part of Chicago, and to a lesser extent in central Chicago. Hispanic Americans did not predominate in any area, but made up their largest share of the sample in central and northern Chicago. Whites on average had the highest levels of education and income, and Hispanics the lowest (Tables 3, 4). Hispanics had the largest average household size and Whites the smallest (Table 5).

Comparisons of Participation Across Groups

Simple comparisons were made across groups for participation in 43 diverse outdoor activities and use of 20 diverse places (Tables 6, 7). Our goal was to look for patterns of similarities and differences between groups across the wide range of activities and places that are important to urban residents seeking outdoor recreation opportunities. Significant differences in participation were measured between racial/ethnic groups in 33 of 43 activities and 13 of 20 places.

Among the general patterns of similarities and differences across groups was that Whites were significantly more likely than the other two groups to participate in activities that required a natural environment, such as tent camping and downhill skiing. Whites were also significantly more

likely than the other two groups to use places outside of Chicago, such as Chain-O-Lakes State Park (Lake County), Morton Arboretum (DuPage County), and Chicago Botanic Garden (far north boundary of Cook County). These areas are accessible to significant concentrations of the White population.

African Americans were significantly more likely than the other two groups to use some places in Chicago, to include Grant Park, Museum of Science and Industry, and Garfield Park Conservatory. Hispanic Americans were significantly more likely than the other two groups to visit Lincoln Park Zoo in Chicago. These areas are accessible to significant concentrations of the respective populations.

We estimated logistic regression models to explain participation in each of the 43 outdoor recreation activities and use of each of the 20 places in terms of race/ethnicity, gender, age, location of residence, education, income, and household size. When all of these variables were included in the analysis, we identified significant differences between racial/ethnic groups in participation in 27 out of 43 activities, and use of 14 out of 20 places. This is a slight reduction in the number of significant differences in activities between racial/ethnic groups identified when only race/ethnicity was considered; but an increase in the significant differences in uses of places over those identified when only race/ethnicity was considered. Space limitations preclude presenting the logistic regression models in this paper. However, the models correctly classified 58 to 99 percent of the respondents with respect to their participation in 43 outdoor recreation activities. Logistic regression models correctly classified between 59 and 97 percent of the respondents with respect to their use of the 20 outdoor recreation places.

The contribution of various demographic variables to the ability of the model to classify participants and non-participants varied a great deal across activities and places. Female gender had a positive correlation with participation in walking for pleasure and gathering plants, as well as visiting Lincoln Park Zoo and the Chicago Botanic Garden; but a negative correlation with participation in many sports and activities that generally use wild or remote sites as well as use of Montrose Point in Lincoln Park. Age had a negative correlation with participation in athletic activities; but a positive correlation with observing wildlife and gardening; as well as visiting a large number of places. Household income had a positive correlation with participation in a wide range of activities and the use of some places; but never had a significant negative correlation with participation in an activity or use of a place. Education had a significant positive correlation with participation in most activities and use of most places. Place of residence factored in to participation in that proximity of residence to particular places was positively correlated with use of some of those places. For example, participation in ice skating was associated with residence in central Chicago.

Preferences

All groups reported that outdoor recreation was important to them, with the Hispanic American and African American respondents reporting the highest levels of importance (Table 8). Whites were significantly less likely than other groups to prefer highly developed facilities in outdoor recreation areas, while African Americans were the most likely to prefer developed facilities (Table 9). Hispanics were in-between the two other groups, with slightly over half (55%) of respondents preferring highly developed facilities. This is consistent with findings of an earlier study that included interviews with Hispanics about their preferences at a picnic area in the San Bernardino National Forest (Chavez, Larson, and Winter 1995). The patterns in preferences for the three groups mirror activity participation patterns as well as the use of selected places.

Respondents evaluated a list of 19 site attributes with respect to their importance (Table 10). Attributes were then rank ordered for each group based on the mean importance score. The rankings were relatively similar for all three racial/ethnic groups, with safety, cleanliness, restrooms, and drinking water the four most important site attributes. There were also some notable differences in rankings between groups. For example, Whites differed from the other two groups in placing a higher rank on the lack of crowding and the presence of a lake or river; but a lower rank on organized events and educational talks. These patterns are consistent with other study findings that indicated Whites preferred natural areas and less development at sites. Asked, "Who do you go with to public outdoor recreation areas in Illinois?" Hispanic Americans were the most likely to report that they recreate in a group that included adults and children in the family (Table 11). Although the proportion of respondents indicating they went with church/social groups was small, African Americans were the most likely of the three racial/ethnic groups to recreate in Church/social groups. Perhaps a tendency to recreate in family/church/other social groups is associated with outings that tend to be relatively close to home and where large groups can easily gather. Hispanics tended to take the fewest number of trips out of state for outdoor recreation ($\bar{m}=1.7$), followed by African Americans ($\bar{m}=2.5$). Whites took the most trips averaging 6.3 out of state trips for outdoor recreation per year (t-tests indicated significant differences between groups at $p<.05$).

Table 1. Comparison of Age Distribution Reported by Racial/Ethnic Groups (in percent).¹

Age Range	White	Black	Hispanic
17-25	8	10	17
26-39	26	32	52
40-55	32	30	25
56-65	16	13	4
66-91	17	14	2

¹Chi-square test indicated significant differences ($p<.05$).

Table 2. Comparison of Area of Residence Reported by Racial/Ethnic Groups (in percent).¹

Area	White	Black	Hispanic
N Suburbs	72	18	10
N Chicago	50	14	36
Ctrl Chicago	18	43	39
S Chicago	13	82	5
S Suburbs	55	31	14

¹Chi-square test indicated significant differences ($p<.05$).

Table 3. Comparison of Education Level Reported by Racial/Ethnic Groups (in percent).¹

Education Level	White	Black	Hispanic
< High School Graduate	7	14	40
High School Graduate	16	16	23
Trade School	6	7	4
Some College	23	36	15
College Degree	25	14	10
Some Graduate School	4	2	2
Graduate Degree	20	11	5

¹Chi-square test indicated significant differences ($p<.05$).

Table 4. Comparison of Household Income Level Reported by Racial/Ethnic Groups (in percent).¹

Income	White	Black	Hispanic
< 15K	10	19	26
15K-25,999	13	17	31
30K-39,999	19	24	23
40K-59,999	21	19	13
60K-79,999	15	10	5
80K-99,999	10	6	3
100K+	12	5	1

¹Chi-square test indicated significant differences ($p<.05$).

Table 5. Comparison of Mean Household Size Reported by Racial/Ethnic Groups.¹

Race/Ethnicity	Mean	% of Households with four or more residents
White	2.7	11
Black	3.1	18
Hispanic	4.2	42

¹T-tests indicated significant differences ($p<.05$).

Table 6. Comparison of Participation in Selected Outdoor Recreation Activities By Racial/Ethnic Groups (in percent).¹

Activity	White	Black	Hispanic
Walk	75++	67-	58-
Zoo	59+	46-	61
Picnic	47	51	46
Drive	51+	46	40-
Bike	47++	37-	40-
Sport spectator	46++	31-	34-
Garden	44++	30-	21-
Pool Swim	45++	23-	32-
Run	30	30	29
Basketball	20--	30+	30+
Arboretum	39++	18-	22-
Observe Wildlife	33++	2-	19-
Non-Pool Swim	34+	14-	32
Baseball	21-	31+	23
Volleyball	17--	22+	23+
Fish	24++	16-	15-
Nature Center	30++	10-	12-
Golf	27++	10-	9-
Hike	24++	8-	9-
Tennis	14	14	12
Tent Camp	18++	9-	12-
Motorboat	21++	7-	5-
Ice Skate	15++	8-	9-
Rollerblade	14+	7-	10
Soccer	8-	6	24+
Horses	9	8	6
Gather Plants	9	8	8
AT Vehicle Use	9	6	6
Volunteer Plant tree	6	7	6
Canoe	11++	3-	7-
RV Camp	7+	4-	8
Rock/Fossil hunt	7+	4-	5
Backpack	6	5	5
Downhill Ski	8++	3-	4-
Vol. Clean River	6+	6	2-
Sail	7++	4-	3-
Water Ski	7++	1-	2-
Vol. Ecol. Restore	3	3	2
X-Country Ski	5++	1-	2-
Hunt	3+	3	1-
Ice fish	3++	1-	1-
Snowmobile	3+	1	1-
Trap	-	-	0

¹+Significantly higher than one other group at p<.05.

- Significantly lower than one other group at p<.05.

Table 7. Comparison of Use of Selected Outdoor Recreation Places By Racial/Ethnic Groups (in percent).¹

Place	White	Black	Hispanic
Grant Park	63+-	72++	50--
Mus. Sci/Indust.	52+-	59++	45--
Brookfield Zoo	50	52	51
Lincoln Park Zoo	45--	53+-	60++
Field Museum	48	51	45
Shedd Aquarium	45-	52+	50
Lincoln Park Conservatory	25	25	31
Chicago Botanic	30++	24-	23-
Indiana Dunes	25	24	21
Garfield Park Conservatory	10-	33++	9-
Montrose Point	20+	14--	20+
Morton Arboretum	22++	7-	7-
Illinois Beach SP	14+	12	10-
Chain O Lakes SP	23++	6-	6-
North Park Vill Nature Center	6	4	4
Shawnee NF	6+	4	3-
Morain Hills SP	5	3	2
Goose Lake PR	4	3	3
Midewin NTGP	2-	4+	3
Ryerson Woods	4+	3	1-

¹+Significantly higher than one other group at p<.05.

- Significantly lower than one other group at p<.05.

Table 8. Comparison of Importance of Outdoor Recreation Reported by Racial/Ethnic Groups (in percent).¹

Importance	White	Black	Hispanic
Very	40	50	62
Somewhat	43	39	34
Not too	13	8	4
Not at all	5	4	1

¹Chi-square test indicated significant differences (p<.05).

Table 9. Comparison of Response to the Question, "Which one of the following statements most closely describes why you use public outdoor recreation areas in Illinois?" Reported by Racial/Ethnic Groups (in percent).¹

Statement	White	Black	Hispanic
To enjoy undeveloped natural surroundings with no facilities	7	4	11
To enjoy undeveloped natural surroundings with limited facilities	53	23	32
To enjoy nature and recreation with highly developed facilities	33	66	55
Do not use Illinois outdoor recreation areas	7	8	3

¹Chi-square test indicated significant differences ($p < .05$).

Table 10. Importance Rankings of Outdoor Recreation Site Attributes By Racial/Ethnic Groups.

Site Attribute	White	Black	Hispanic	ALL
Safe from crime	1	1	2	1
Clean/maintained	2	2	1	2
Restrooms	3	3	4	3
Drinking water	4	4	3	4
Parking	5	5	5	5
Nature/scenery	6	7	6	6
Picnic facilities	8	6	7	7
Not too crowded	7	10	13	8
Close to home	11	12	9	9
Self-guided nature trail	10	14	11	10
Educational talks	14	8	8	11
Lake or river	9	15	14	12
Nature center	12	13	10	13
Organized events	17	9	12	14
Paved trails	15	11	15	15
Unpaved trails	13	17	17	16
Guided hikes	16	16	16	17
Fishing	18	18	18	18
Boat launching	19	19	19	19

Table 11. Comparison of Response to the question, "Who do you go with to public outdoor recreation areas in Illinois?" reported by Racial/Ethnic Groups (in percent).¹

Who do you go with?	White	Black	Hispanic
Adults in the family	20	11	16
Children in the family	8	13	11
Adults & children in the family	35	43	58
Church/Social group	1	4	1
Friends	28	20	12
No one/Alone	5	6	1

¹Chi-square test indicated significant differences ($p < .05$).

Summary and Conclusions

Our samples of White (non-Hispanic) American, African American, and Hispanic American residents of Cook County Illinois had significant differences in gender, age, education, income, residence, and household size; all of which can have implications for outdoor recreation preferences and behavior. These variables and race/ethnicity in a logistic regression model help explain participation in 43 outdoor recreation activities and in the use of 20 selected outdoor places.

Important similarities across the three racial/ethnic groups include the attachment of a high level of importance to outdoor recreation (especially high for the Hispanic and African American groups), and the high level of importance of safety, cleanliness, and drinking water at the areas where they recreate. Important differences between racial/ethnic groups include the specific activities engaged in, places used, preferences for site development and programming, who accompanied individuals in their recreation activities, and number of outdoor recreation trips taken out of state.

The sample generated for this study suggests that urban racial/ethnic groups are complex and differ along a number of significant demographic dimensions. Their outdoor recreation preferences and behavior are diverse and complex. This diversity and complexity should inform the development of policies, programs, and plans for providing important outdoor recreation opportunities for urban populations; as well as future research. Care should be taken to avoid stereotyping particular groups or using simple explanations of their outdoor recreation behavior.

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EVALUATING MULTIPLE DIMENSIONS OF VISITORS' TRADEOFFS BETWEEN ACCESS AND CROWDING AT ARCHES NATIONAL PARK USING INDIFFERENCE CURVE ANALYSIS*

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Abstract: Tradeoffs are an inherent part of many of the decisions faced by outdoor recreation managers. For example, decisions concerning the social carrying capacity of popular attraction sites involve tradeoffs between limiting visitor use to ensure a high quality experience and allowing high levels of visitor use to ensure that large numbers of visitors retain access to park and outdoor recreation resources. This study uses indifference curve analysis to evaluate the tradeoffs visitors are willing to make between access and visitor use levels at Delicate Arch, Arches National Park. Differences in the evaluation of tradeoffs between access and crowding are examined for first time visitors versus repeat visitors; local visitors versus non-local visitors; and across questionnaire formats. The results of the indifference curve analysis allow Arches National Park managers to make informed evaluations of alternative management options for visitor use at Delicate Arch.

Introduction

Tradeoffs are an inherent part of many of the decisions faced by outdoor recreation managers. One of the more challenging and pervasive issues outdoor recreation managers face concerns the appropriate level of use, or social carrying capacity, of popular attraction sites. Decisions about appropriate levels of visitor use involve inherent tradeoffs between limiting visitor use to ensure a high quality visitor experience and allowing high levels of visitor use to ensure that large numbers of visitors retain access to park and outdoor recreation resources (Manning, Valliere, & Jacobi 1997).

A number of frameworks have been developed to provide park and outdoor recreation managers with a basis for making decisions about the social carrying capacity of outdoor recreation settings. These frameworks include Visitor Experience and Resource Protection (VERP) (National Park Service 1997), Limits of Acceptable Change (LAC) (Stankey et al. 1985), and Visitor Impact Management (VIM) (Graefe, Kuss, & Vaske 1990).

Common to these approaches is the formulation of indicators and standards of quality. Indicators of quality are measurable, manageable variables that serve as quantifiable proxies for management objectives. Standards of quality define the minimum acceptable condition of indicator variables (Manning, 1999).

While a number of studies have been conducted to define the social carrying capacity of various outdoor recreation settings, there have been few attempts to explicitly consider the inherent tradeoffs between quality and access. There is evidence that social carrying capacity may be significantly affected when management implications are explicitly considered by study respondents (Manning, Valliere, Wang, & Jacobi 1999). That is, visitors may be more tolerant of higher levels of visitor use when they are aware that their standards of quality may result in limitation or regulation of visitor access to attractions and facilities.

This paper describes techniques used to apply indifference curve analysis to evaluate the tradeoffs associated with the social carrying capacity of Delicate Arch, Arches National Park. Specifically, this study examines the tradeoffs visitors are willing to make between the number of visitors at one time at Delicate Arch and the percentage chance of receiving a hypothetical permit to hike to Delicate Arch.

Indifference Curve Theory

Indifference curve theory, developed in economics, provides a model representing the tradeoff decisions an individual makes in allocating a fixed level of income between two consumer goods (Nicholson 1995). There are two primary components to the indifference curve model, the individual's indifference curves and his/her budget constraint. A single indifference curve represents all possible combinations of two goods (e.g. A and B) that provide the individual with the same level of utility (Pindyck & Rubinfeld 1995). The curves labeled IC₁ and IC₂ in Figure 1 are examples of indifference curves. The budget constraint represents the possible combinations of goods A and B the individual can purchase, assuming the individual spends all of his/her income (Pindyck & Rubinfeld 1995). For example, the budget constraint labeled BC in Figure 1 represents all possible combinations of the two consumer goods A and B, for a fixed income level.

According to indifference curve theory, the optimal combination of goods A and B for a given level of income is located where the budget constraint is tangent to one of the individual's indifference curves (Nicholson 1995). This represents the highest level of utility the individual can achieve from the consumption of goods A and B, given a fixed level of income. In Figure 1, the optimal combination of goods A and B is represented by point X. A more complete discussion of indifference curve theory is presented in Lawson and Manning (2000).

Methods

Indifference curve analysis was applied to the evaluation of social carrying capacity at Delicate Arch by substituting

lack of crowding at Delicate Arch and accessibility to Delicate Arch for consumer goods (i.e., goods A and B in Figure 1). Specifically, the number of people at Delicate Arch was substituted for good B along the y-axis, and the percent chance of receiving a hypothetical permit to hike to Delicate Arch was substituted for good A along the x-axis.

Indifference Curves

Indifference curves were estimated following a procedure adapted from MacCrimmon and Toda (1969). In this procedure, respondents are presented with a series of pairs of crowding and accessibility conditions. The first component of each pair of conditions is a fixed reference condition, against which respondents evaluate an alternative condition. Respondents are asked to indicate their preference within each pair of conditions they evaluate. For example, respondents were asked to express their preference between a first set of conditions – having a 100 percent chance of receiving a permit to hike to Delicate Arch and seeing 108 people at Delicate Arch – and a second set of conditions – having a 50 percent chance of receiving a permit to hike to Delicate Arch and seeing 36 people at the Arch. See Lawson and Manning (2000) for a graphical description of the methods used to estimate indifference curves.

Regression analysis was used to estimate an indifference curve for each respondent based on the data points derived from his/her evaluation of a series of access and crowding conditions at Delicate Arch. For each respondent, a hyperbolic, semi-log, and quadratic curve was fit to the data points. The functional form for each individual indifference curve was selected based on the goodness of fit (R-square) of the regression equation, and the explanatory significance of the access variable (chance of receiving a permit) on the number of people at Delicate Arch.

Budget Constraint

A simulation model of visitor use at Arches National Park was used to estimate points along the budget constraint representing the possible combinations of visitor use levels and accessibility at Delicate Arch. Computer simulation models have been successfully applied to a variety of park and outdoor recreation areas (e.g., Potter & Manning 1984; Wang & Manning 1999; Schechter & Lucas 1978). Additional information about the inputs used to develop the simulation model can be found in Lawson and Manning (2000).

The simulation model was run at three levels of daily visitor use. The first level of use represented the Park's average daily use in the summer, which was used as a proxy for a 100 percent chance of receiving a permit to hike to Delicate Arch. The second level of use was 50 percent of the Park's average daily use, which was used as a proxy for a 50 percent chance of receiving a permit to hike to Delicate Arch. The third level of use was 25 percent of the Park's average daily use, which was used as a proxy for a 25 percent chance of receiving a permit to hike to Delicate Arch.

For each use level, the model was run 12 times to account for variability in model parameters. The outputs from the simulation model runs were used to estimate the maximum number of people seen at Delicate Arch at one time by at least one visitor per day, for each of the three accessibility conditions. A linear budget constraint was estimated from the three data points. Given the scope of this paper, a linear budget constraint was assumed for the purposes of simplification. Subsequent research should investigate the validity of this assumption.

Indifference Curve Analysis

Lastly, each individual's indifference curve was mathematically adjusted by adding a constant term to the equation for the indifference curve, to find the point where the indifference curve is tangent to the budget constraint. The point of tangency between the adjusted indifference curve and the budget constraint reveals the respondent's preferred combination of visitor use and accessibility, given the possible conditions at Delicate Arch.

Visitor Survey

Two versions of the indifference curve questionnaire were administered to visitors during the summer of 1999 as they returned from their hike to Delicate Arch. One version of the questionnaire included photographs depicting the number of visitors at Delicate Arch associated with each pair of conditions that respondents were asked to evaluate. The second version of the questionnaire included narratives describing each pair of conditions that respondents were asked to evaluate. Photographs of the number of visitors at Delicate Arch were not included in the second version of the questionnaire. Both versions of the questionnaire were administered on laptop computers. A total of 124 individuals responded to the questionnaire with photographs and 113 individuals responded to the questionnaire with narratives.

Results

For those individuals who responded to the questionnaire with photographs, results are presented for the estimation of each respondent's indifference curve. The budget constraint, constructed from the output of the simulation model of visitor use at Arches National Park is reported. Additionally, the preferred combinations of access and visitor use at Delicate Arch derived from the indifference curve analysis are presented for respondents to the questionnaire with photographs. Finally, the results of three chi-square tests are reported. The first test examined differences in the evaluation of tradeoffs between access and crowding for first time visitors versus repeat visitors. The second test examined differences in the evaluation of tradeoffs between access and crowding for local visitors to Arches National Park versus non-local visitors. The third test examined differences in the evaluation of tradeoffs between access and crowding for respondents to the questionnaire using photographs versus respondents to the questionnaire using narratives.

Indifference Curves

Indifference curves were derived for 123 respondents to the questionnaire with photographs, based on their evaluation of the tradeoffs between access and visitor use levels at Delicate Arch. Data from one respondent were excluded from the analysis because the data did not conform to the expected properties of indifference curves.

Analysis of sample data revealed 16 unique indifference curves. Respondents were categorized into one of three groups based on the characteristics of the preferences they revealed. The first group includes individuals whose preferences are "access oriented". In other words, these respondents would tolerate seeing relatively large numbers of people at Delicate Arch to help ensure they would be granted access to the Arch. The second group includes individuals whose preferences are "low use oriented". These respondents would tolerate a lower chance of being granted access to Delicate Arch to help ensure that if they received access to the Arch they would see relatively few people. The third group includes individuals whose preferences are "tradeoff oriented". In other words, these respondents would be more likely to negotiate or make tradeoffs between accessibility and visitor use levels than respondents in the other two groups.

Figure 2 illustrates indifference curves representative of individuals with "access oriented", "low use oriented", and "tradeoff oriented" preferences. The values on the y-axis represent the maximum number of people seen at Delicate Arch at one time by at least one visitor per day. The values along the y-axis are inverted to represent increasingly desirable "crowding" conditions, based on the assumption that respondents would prefer to see fewer people at Delicate Arch. The values on the x-axis represent the percentage chance of receiving a permit to hike to Delicate Arch. The percentage chance of receiving a permit to hike to Delicate Arch serves as a proxy for total use at Delicate Arch. Current total use at Delicate Arch is represented as a 100% chance of receiving a permit to hike to Delicate Arch. The values along the x-axis extend beyond a 100% chance of receiving a permit to hike to Delicate Arch to represent total use levels that are greater than current total use levels. However, respondents were not asked to evaluate any conditions in which the percent chance of receiving a permit to hike to Delicate Arch was greater than 100%.

Nearly half of all respondents revealed preferences characterized as "low use oriented" (48.8%), compared with just one-fifth of respondents having preferences characterized as "access oriented" (20.3%). Just under one-third of respondents had preferences that were characterized as being "tradeoff oriented" (30.9%).

Budget Constraint

The budget constraint defining the possible combinations of accessibility and visitor use for Delicate Arch was derived from output generated by a simulation model of visitor use at Arches National Park. Output from the simulation model resulted in three data points for the budget constraint. Regression analysis was used to

estimate a linear budget constraint based on the three data points. Figure 3 presents the budget constraint defining the possible combinations of access and visitor use levels at Delicate Arch.

Indifference Curve Analysis

An indifference curve was estimated for each respondent to the questionnaire with photographs. Each respondents' indifference curve was then adjusted to find the point of tangency with the budget constraint. Figure 4 presents the percent of respondents with each of the preferred combinations of access and visitor use at Delicate Arch. The budget constraint for Delicate Arch is represented by the line labeled BC. Each point noted along the budget constraint represents a preferred combination of access and crowding at Delicate Arch for at least one respondent. The number beside each point indicates the percent of respondents with the corresponding preferred combination of access and crowding.

Comparisons of Tradeoff Evaluations by Visitor Type and Questionnaire Format

An analysis was conducted to determine the potential effect of visitor type and questionnaire format on the findings from the indifference curve analysis. The first chi-square test examined differences in the evaluation of tradeoffs between access and crowding at Delicate Arch for first time visitors versus repeat visitors. Repeat visitors were defined as any individual who reported that they had visited Arches National Park on a previous trip. The results of the statistical test indicate that the distribution of first time visitors among the three preference categories ("access oriented", "low use oriented" and "tradeoff oriented") is not significantly different than that of repeat visitors ($\chi^2 = 0.361$, $p = 0.84$).

The second chi-square test examined differences in the evaluation of tradeoffs between access and crowding at Delicate Arch for local visitors versus non-local visitors. Local visitors were defined as residents of any of the "four-corners" states (i.e., Colorado, New Mexico, Arizona and Utah). Non-local visitors were defined as residents of any state other than one of the "four-corners" states. The results of the statistical test indicate that the distribution of local visitors among the three preference categories is significantly different than that of non-local visitors ($\chi^2 = 5.864$, $p = 0.05$). About half of both local visitors (49.2%) and non-local visitors (48.4%) revealed preferences characterized as "low use oriented". However, local visitors (27.9%) are more likely to be "access oriented" than non-local visitors (12.9%). Additionally, more than one-third of non-local visitors (38.7%) indicated "tradeoff oriented" preferences, compared with just under one-quarter of local visitors (23.0%).

The third test examined differences in the evaluation of tradeoffs between access and crowding at Delicate Arch for respondents to the questionnaire using photographs versus respondents to the questionnaire using narratives. The statistical test revealed significant differences between the preferences of respondents to the two questionnaire formats ($\chi^2 = 11.246$, $p = 0.00$). Specifically, nearly half of all

Figure 1. Theoretical Indifference Curves
and Budget Constraint

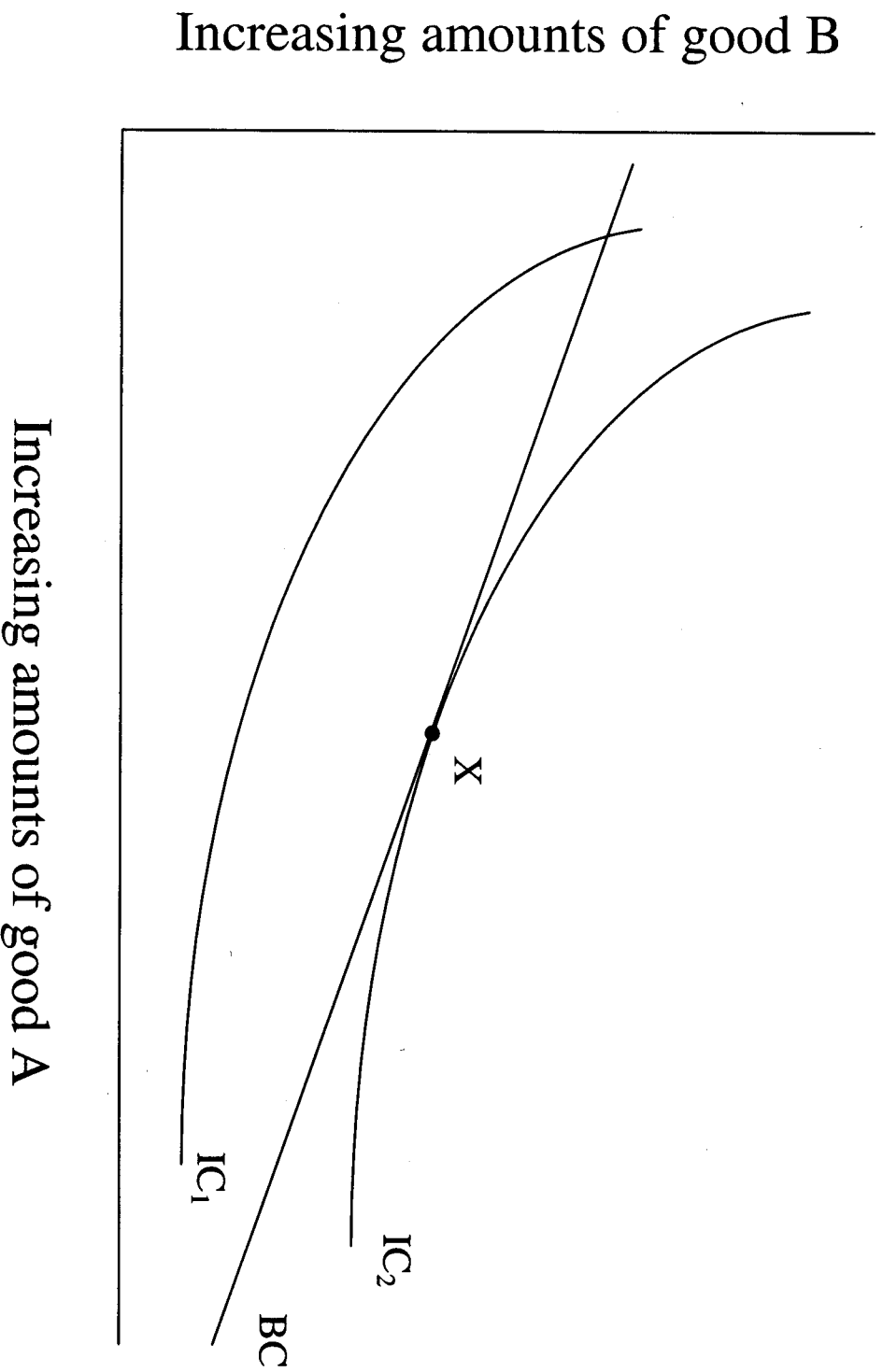
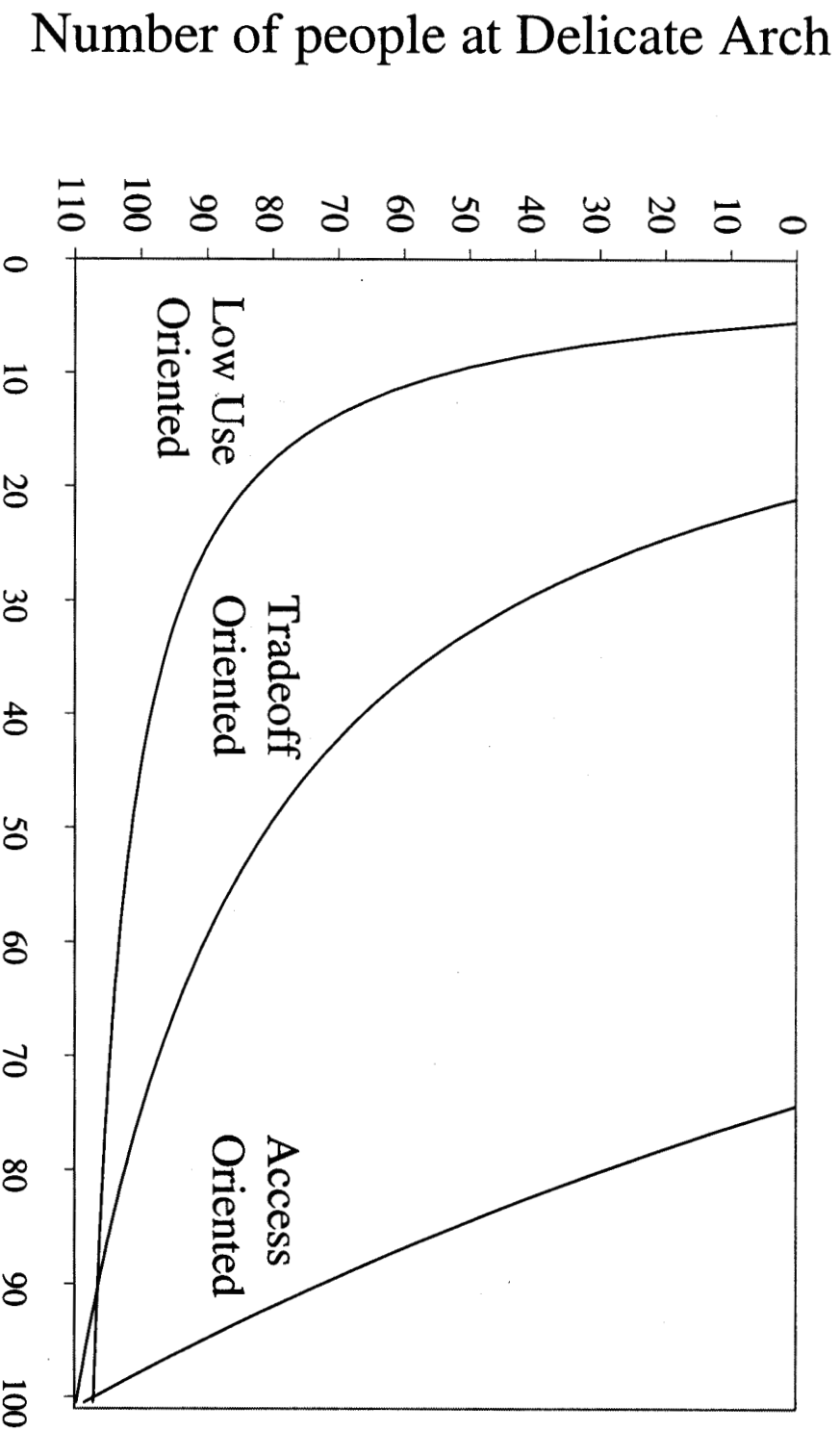
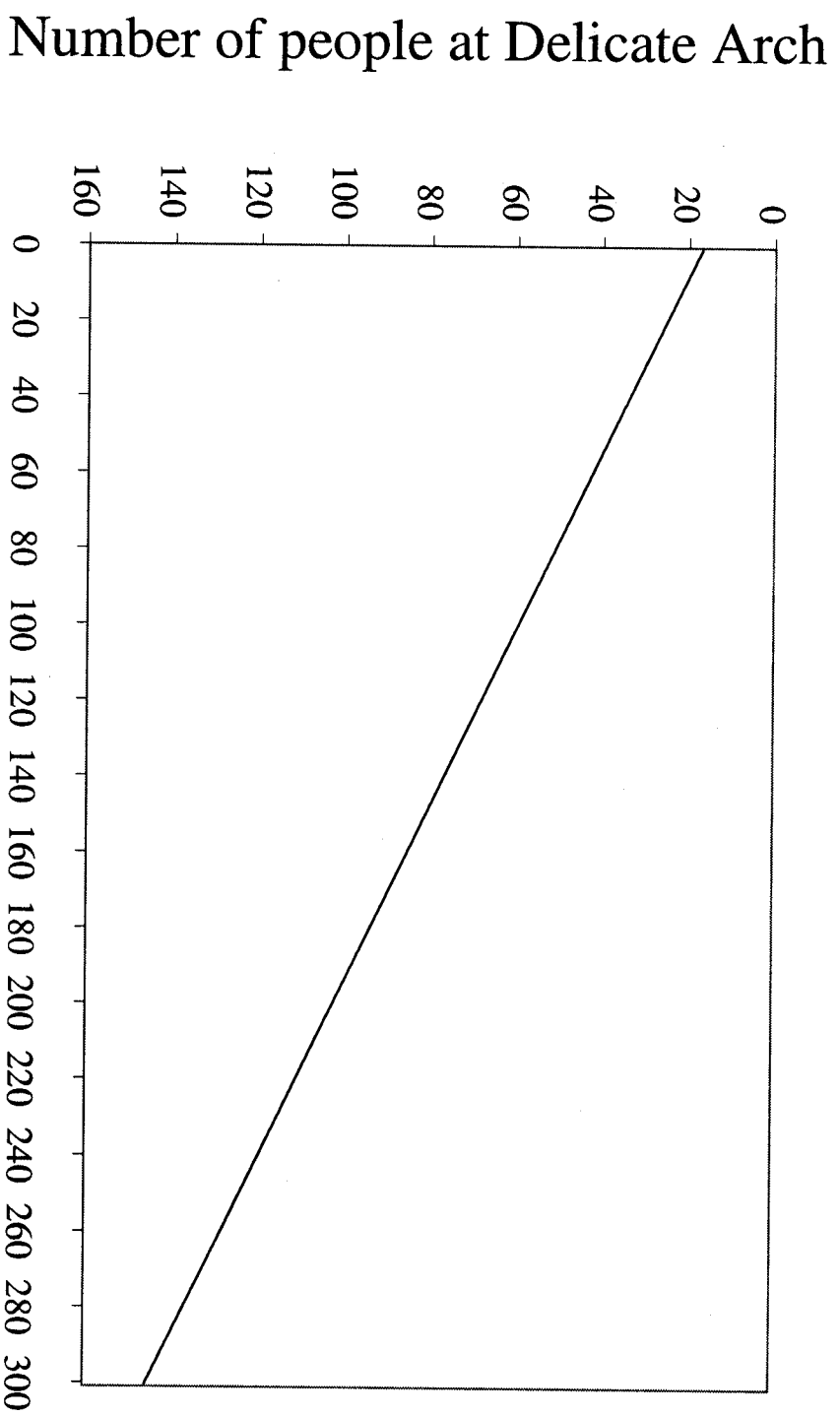


Figure 2. Indifference Curves – Access, Low Use, and Tradeoff Oriented Visitors



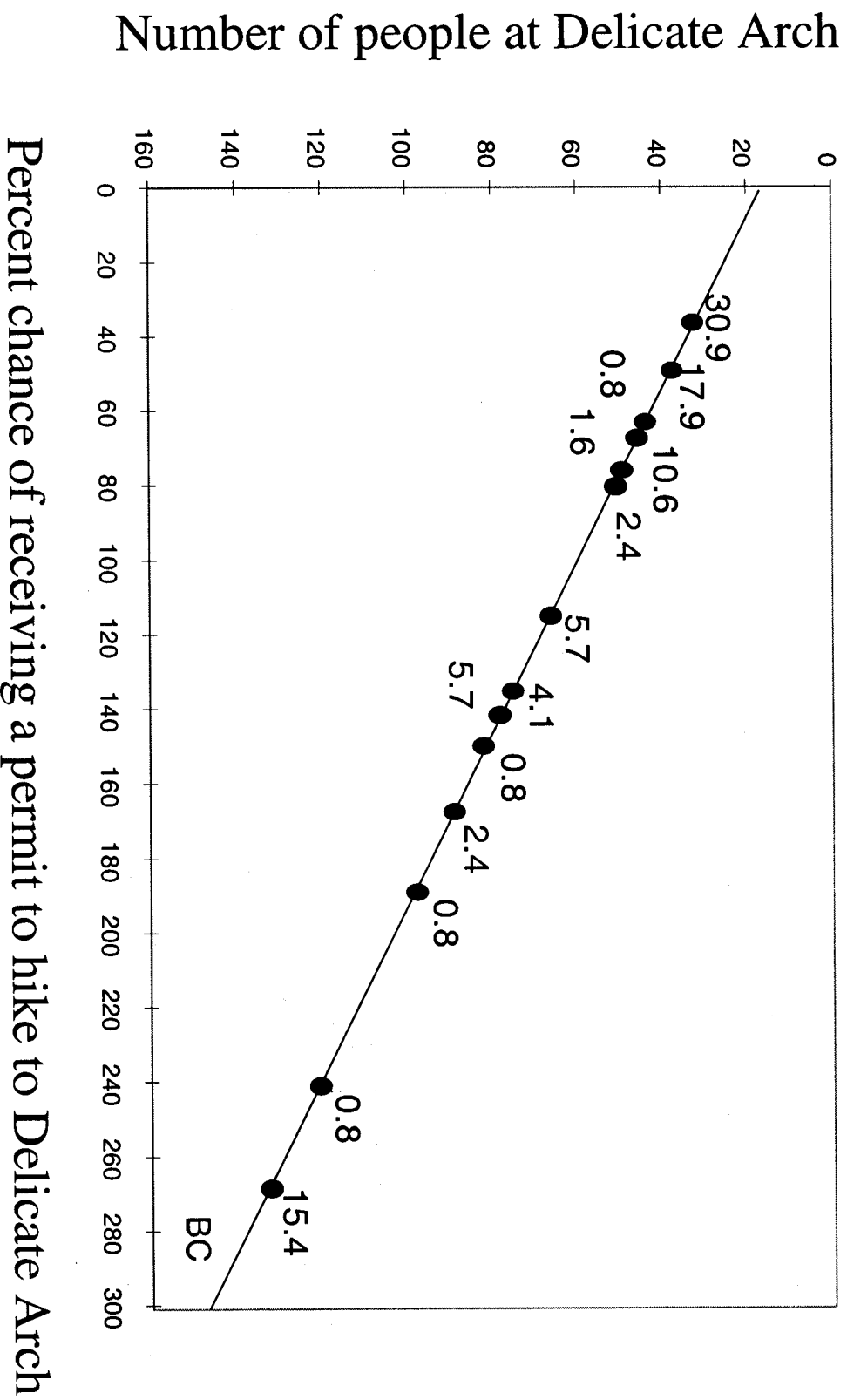
Percent chance of receiving a permit to hike to Delicate Arch

Figure 3. Budget Constraint for Delicate Arch



Percent chance of receiving a permit to hike to Delicate Arch

Figure 4. Preferred Combinations of Access and Visitor Use at Delicate Arch



respondents to the questionnaire using photographs (48.8%) revealed preferences characterized as "low use oriented", compared with just under one-third of respondents to the questionnaire using narratives (32.0%). Respondents to the questionnaire using narratives (40.0%) were more likely to reveal preferences characterized as "access oriented" than respondents to the questionnaire using photographs (20.3%). Just under one-third of respondents, regardless of questionnaire format, revealed preferences characterized as "tradeoff oriented" – 30.9% of respondents to the questionnaire using photographs and 28.0% of respondents to the questionnaire using narratives.

Conclusions

The results of this study suggest that indifference curve analysis provides a useful tool for park managers to evaluate the tradeoffs inherent in decisions about appropriate levels of visitor use at popular attraction sites. Indifference curve analysis allows managers at Arches National Park to make more informed evaluations of alternative management options for visitor use at Delicate Arch.

One of the management alternatives Arches National Park managers have is to freeze visitor use at Delicate Arch at current levels. The budget constraint indicates that if park managers continue to manage Delicate Arch at current use levels, visitors would see no more than 62 people at one time at the Arch. The results of the indifference curve analysis suggest that rather than allowing current use levels at Delicate Arch to persist, about two-thirds of the sample (64.2%) would prefer park managers to reduce visitors' chances of hiking to Delicate Arch to ensure that those who do go to the Arch see fewer than 62 people at one time. About one-third of the sample (35.7%) would prefer that park managers increase visitors' chances of seeing Delicate Arch, rather than maintaining current visitor use levels at the Arch.

A second alternative is to manage Delicate Arch in a manner that reflects the preferences of "low use oriented" visitors or "access oriented" visitors. Management actions taken to reduce the number of visitors seen at one time at Delicate Arch would be favored by about half of all respondents (48.8%). For example, these "low use oriented" visitors would prefer to see park managers initiate a permitting system to reduce the number of visitors seen at one time at Delicate Arch. About one-fifth of respondents (20.3%) have preferences characterized as "access oriented". Management actions that increase visitors' chances of seeing Delicate Arch (e.g. increasing the number of parking spaces at the Delicate Arch trailhead) would be favored by these "access oriented" visitors. Just under one-third (30.9%) of the sample have preferences characterized as "tradeoff oriented". These visitors would not necessarily favor management actions that reflect the preferences of either "low use oriented" visitors or "access oriented" visitors.

As the indifference curve data indicate, there are a substantial number of visitors with preferences

characterized by each of the three preference categories. In light of these findings, Arches National Park managers might choose to manage visitor use levels by zones. Certain zones within the park could be managed to meet the preferences of "low use oriented" visitors. Visitors' access to these zones would be restricted through the use of a permitting system, or some other mechanism, in order to ensure a relatively "uncrowded" visitor experience. Other zones could be managed to meet the preferences of "access oriented" visitors. Visitors' chances of seeing attractions in these zones would not be restricted or limited by a permitting system. Virtually anyone who wanted to visit these zones would be able to. "Tradeoff oriented" visitors could choose among the various zones to meet their preferences for accessibility and visitor use levels at park attractions. Indifference curve data can help quantify choices about managing the park by zones.

Managers at Arches National Park may want to provide a visitor experience that targets the preferences of local visitors or non-local visitors. The results of this research inform Park managers about how various visitor use management alternatives will serve local and non-local visitors' preferences for access and crowding conditions. For example, management actions that increase visitors' chances of seeing Delicate Arch would be more consistent with the preferences of local visitors than non-local visitors. Additionally, Park managers can use these study results to make more informed decisions about how to designate management zones within Arches National Park that target local visitors or non-local visitors based on the chance of receiving access to the attractions in the zone and the number of other people visitors would see while visiting the attractions.

The results of this study suggest that the type of questionnaire format used to elicit evaluations of tradeoffs between access and crowding at Delicate Arch may influence study results. Further research should be conducted to investigate the effect of questionnaire format on the indifference curve analysis of tradeoffs in outdoor recreation management. Generating larger sample sizes for alternative questionnaire formats and controlling for the access and crowding conditions experienced by respondents to the indifference curve questionnaires would provide more insight into this issue.

Additional research might investigate the temporal consistency of individuals' preferences for access and lack of crowding. For example, respondents to an on-site survey like the one in this study could be recruited to participate in a follow-up mail survey. The mail survey would ask respondents to evaluate the same combinations of access and crowding conditions that they were asked to evaluate in the on-site questionnaire. Each individual's responses to the mail survey could be compared to his/her responses to the on-site survey to examine if preferences for tradeoffs between access and lack of crowding change over the full duration of the recreation experience.

Further research might focus on the effect on social carrying capacity of shifting the budget constraint

associated with an attraction site. Shifting the budget constraint might be accomplished through visitor management or site design. For example, the budget constraint representing possible combinations of accessibility and visitor use levels at Delicate Arch could be shifted by scheduling the departure times of visitors hiking to Delicate Arch (Manning and Potter 1984). By scheduling visitors' hiking trips to Delicate Arch, park managers could potentially lower the number of people seen at one time at Delicate Arch while holding total use levels constant. Such a shift in the budget constraint would influence the outcome of the indifference curve analysis.

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EFFECTIVE SURVEY AUTOMATION

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Abstract: Progress in the options for survey data collection and its effective processing continues. This paper focuses on the rapidly evolving capabilities of handheld computers, and their effective exploitation including links to data captured from scanned questionnaires (OMR and barcodes). The paper describes events in Parks Canada that led to the creation of survey software for handhelds. A current commercial Mobile Computer Assisted Personal Interviewing (MCAPI) application that grew out of the work at Parks Canada is used to demonstrate the current state of the art, and future applications are discussed. Basic decision making criteria for selecting a survey data collection method are provided.

Introduction

From the 1960s to 2000 we have experienced a technology revolution. This revolution has been associated with increasing options for cost-effective data collection and analysis (Beaman 1969, Wintrob 1987). As part of this revolution, an integrated framework for data automation was introduced into Parks Canada, yielding participation in discussions on technology and data at professional meetings such as NERR (Parks Canada 1988; Grim and Beaman 1989a and 1989b; Thomson, Cotter and Beaman 1992; Jaro, Stanley and Beaman 1992). Parks Canada was examining various options that produced electronic data such as traffic counters, data capturing cash registers, push-button questionnaires (Cadotte 1979) and "automated kiosks" (Cotter 1991).

As part of the revolution personal computers became "readily" available so that dependency on support groups that controlled access to mainframe computers was broken. Use of modems for transmission of data from field to a location where analysis could be done became feasible. Transportable computers evolved from luggable to laptop, and finally to truly portable handhelds. Software was also progressing, so that executing a complicated survey on a handheld computer became feasible (Sainsbury, Ditch and Hutton 1993; papers in Westlake, Martin, Rigg and Skinner 1999).

Surveys have been an important data collection method for Parks Canada since the 1960s or earlier (see references in Girt 1981, Parks Canada 1983, Canadian Parks Service 1992). In the early seventies Parks Canada began to collect survey data directly rather than relying on contractors. By the mid eighties concerns about the effort that went into

planning for surveys, executing them and getting clean data for use in the analysis had risen. Planning for a summer survey could begin one fall, and not until well after the survey planning cycle had begun again the next year would data even be back from keyboarding. Cleaning of data files, analysis and report writing would then commence. With luck results would be presented in January or February, more than a year after a project was planned.

One option to make the collection of survey data more effective became clear. It was reducing the time and labor in going from an interview to clean files for analysis. By the late 1980s changing technology offered several options. Scanners and "image processing" was one. Also, durable and reliable handheld computers were becoming available. Parks Canada's headquarters saw a great potential for handheld computers and purchased two units for Atlantic Region to try. The idea to be tested with these was that by collecting survey data on a handheld, when an interview was over one had clean data ready to be sent by modem to be "added" to an analysis file. In theory analysis could begin during the survey season and next year's planning could be completed soon after the end of the survey. For most surveys ending after Labor Day, in principle, reports could be ready in early fall. Note that while scannable paper questionnaires can offer rapid turnaround as well, scanning is an extra step, the forms may need to be shipped from the survey site, and control of questionnaire navigation and data input values during the interview are not possible.

Discoveries from the experiment

The Atlantic Region handheld experiment basically went well. A lot of effort went into programming the handhelds and much of that was repetitive and tedious. Similar codelists and editing code had to go into different questions and questionnaires to get them properly displayed on a handheld. Furthermore there was variation in coding because of the differences in machines that were being tested. There was typing, retyping, cutting, pasting and formatting.

What became clear was that:

1. Future gains could certainly be made by automation of much of the programming involved in getting questionnaires into handhelds and displaying properly, branching as required and storing responses. But getting questions setup and running so valid responses were captured was only part of the battle. The structure of output data files to be produced by the handhelds had to be programmed and a program had to exist to "collect" data from a particular survey from multiple handhelds and produce a valid aggregate analysis file. Conditional branches based on a person's responses created some tricky details in producing these files. Because output from the handheld was just input to a program to produce analysis files, even though one had defined codes for asking questions, these values had to be linked into output analysis programs so that, at some point, one could create an analysis file (e.g., SPSS or SAS file).

2. Gains could be made by having questions and responses in a data base so that:
 - they could be easily accessed and formatted into program code producing proper display on a handheld;
 - the responses could be incorporate into response editing code; and
 - questions, codes and their description could be used in defining variable labels and value labels in an analysis file.

Unfortunately, it was often discovered after questionnaires went into the field that they were not perfect. Making adjustments for this required a great deal of careful programming. Not only was it necessary that code for collecting the data be modified, code for output had to be modified to accommodate the inclusion of new variables and the elimination of any removed. This resulted in a problem in "linking together" data produced with different versions of a questionnaire. When questionnaire revisions occur during the course of a survey, major savings can result from programming that performs data consolidation while automatically accommodating all the modifications.
3. Another problem area was managing the data collected, particularly when the same computer was used for more than one questionnaire. When one is getting data from a computer, particularly datasets for different questionnaires, and bringing each together with other data files previously obtained from the same and other handhelds, errors could arise. Some data were overwritten, some were included two or three times. This meant that, where possible, some files from handhelds had to be recovered and properly added to cumulative files. Where extra records were in data they had to be found and removed.
4. Problems could be avoided and gains made by building standards and rigorous integrity controls into data files produced by the handhelds and supporting these in routines that received and aggregated them to produce the analysis files.

Even if the comments above suggest that there were lots of problems, the experiment was judged to be a success. Atlantic Region acquired more handheld computers and used them in numerous surveys. Other regions adopted the technology. Along with acquisitions went a commitment to addressing the areas in which the effectiveness of handheld based surveys could be improved. By 1992 Parks Canada's Western Region had enough handheld survey activity that they took over responsibility for innovation and development. In 1995, with a change in philosophy and management in Parks Canada, staff responsible for the handheld technology and some other survey work in Parks Canada made the decision to leave, in order to push forward with development of the concept on a commercial basis. The software used in the following examples is the result of the efforts by this group.

The fact that handhelds became a key development area and, say, scanning of paper questionnaires was not a thrust, reflects circumstance. In fact, handhelds are being used

with paper questionnaires to improve data collection efficiency for particular surveys. Choosing the appropriate cost-effective data collection technology for a given situation should always be a goal (for more information on scannable forms see LoPresti and Maphtali 1996; Acumen Systems 2000; and Principia Products 2000).

Some Examples of Applications

Prior to discussing what has been achieved and what is seen as important, some examples of Mobile Computer Assisted Personal Interviewing (MCAPI) applications will give an insight in the nature and complexity of what can be done.

Yukon Tour Bus Study

In 1999 Parks Canada conducted a survey of tour bus visitors to sites in the Yukon (Weisberg and Thomlinson 1999). The short tour bus season and tight schedule for each tour group meant that rapid data collection was imperative. An easy to use and reliable solution was critical, as the project manager was located over 1,000 miles away, making on-site supervision impractical.

The project utilized handheld computers with built-in bar code scanners, running the Mobile Interviewer™ software from Technos™ Systems Inc, and OMR (Optical Mark Reading) mailback questionnaires. An interviewer used the handheld to collect information about each tour group from the bus driver. A mailback post-card sized questionnaire was then handed out to each passenger on the bus, after scanning the form's unique bar coded serial number into the interview record. This enabled individual responses to be linked to group information with a very high degree of accuracy. The overall approach substantially decreased respondent burden, as each passenger was only required to provide personal views, without having to describe the entire group's itinerary—information that the driver provided with greater accuracy. The method met the goals of the project manager. Interviewers liked it as well, considering the opportunity to use the handhelds to be the "fun part" of the job.

Liquor Control Board of Ontario (LCBO) Study

In November 1999, the LCBO used the Mobile Interviewer software to conduct in-store research at its new flagship retail location in Toronto. The questionnaire used branching extensively, first screening respondents based on a series of demographic characteristics. Qualifying respondents were then asked a set of 13 attitudinal questions. The software performed a series of calculations based on mean scores derived from previous research, and identified which of five customer types best fit the respondent—all in real time. Based on the customer type, further in-depth research was conducted in the store.

The alternative, using paper questionnaires, would have required the respondent to wait while data was entered into a laptop and the calculations performed. Using the handhelds made the experience a better one for both respondent and interviewer, according to the LCBO's director of customer insights, who said: "It was easy, instant, and looked cool."

The State of the Art

These examples indicate that the state of the art has advanced quickly. Progress has occurred in both hardware and software.

Hardware

Most papers examining Computer Assisted Personal Interviewing (CAPI) have looked at the use of laptop computers (Sainsbury, Ditch and Hutton, 1993; deLeeuw and Nicholls 1996). There are many problems with the use of laptops in the field:

- Unacceptable battery life (e.g., 1-5 hours);
- Easily damaged (by dropping, or from dust and moisture);
- Poor ergonomics (heavy, difficult to use while standing, and tends to come between respondent and interviewer);
- Cost;
- Operating system (reliability, time to start up/shut down).

Parks Canada pioneered the use of ruggedized industrial handhelds for survey research in the late 1980s in order to address many of these problems. Battery life was 8-10 hours, the units were designed for outdoor use, and were smaller and lighter than a laptop (though at about two pounds, still no picnic for the interviewer to carry for eight hours). Cost remained very high however, and because the units were specialized, only a few vendors existed.

In 1993 Apple Computer's Newton MessagePad created the concept of a powerful yet inexpensive mobile computer. The device didn't catch on, but in 1996 Palm Computing released a smaller and less expensive device, and the market for consumer handhelds took off. Today almost every computer, electronics, and office supply store carries Palm devices. The base model weighs 6 ounces, uses common AAA batteries which provide 40-50 hours of run-time, features an exceptionally easy to use and reliable operating system designed for mobile computing—and costs only US\$150.

Palm Computing is the clear leader with over 75% market share at present. Palm has also licensed its technology to other manufacturers, including Handspring, Symbol, Sony and TRG. All Palm devices come with built in programs that can be used to manage project-related information, and third party developers have developed an amazing assortment of add-on programs. Hardware accessory manufacturers have produced data acquisition devices including GPS receivers, digital voice recorders, and temperature and altitude sensing modules. These could be combined with survey software to provide new research approaches.

Current handheld hardware is an excellent alternative to standard paper-based interviewing. Future enhancements will come in the areas of wireless connectivity, which will enable functions such as real-time quota control; larger colour screens with adequate battery life, which will allow

the incorporation of multimedia in the survey instrument; and more powerful processors, which will make voice recognition the main input method.

Software

Handheld survey software has also been advancing as the hardware improves. Techneos appears to be the only developer with Mobile Computer Assisted Personal Interviewing (MCAPI) software for Palm OS devices. Some companies had developed for Microsoft Windows CE, but changes in the operating system orphaned the products. Products from additional vendors are likely in the future as the popularity of handhelds continues to grow. Other companies offer custom survey programming. This can be an alternative for very large, ongoing surveys that require a custom interface design, but it is expensive, time-consuming and risky when dealing with numerous ad-hoc research projects.

The issues with the use of handhelds for survey data collection that Parks Canada identified led to the development of a meta-data model. This work established the concepts on which Techneos's software is based. Meta-data is "information about information." Normally interview data is stored as a value (e.g., "1") for a particular variable (e.g., "SATISFAC"). A survey system capable of handling meta-data can also store information about the value: "1" means "Very Satisfied" and was recorded in response to the question "How satisfied were you with the quality of papers presented at the symposium?" Information about which questionnaire was used to collect that value, and on which handheld, in what language, and at what time, is also meta-data.

Meta-data is an extremely powerful tool for survey data. Techneos's software is built from the ground up with meta-data in mind, giving it capabilities that are otherwise impossible. Although very few survey software packages currently use meta-data, a new survey interchange standard called Triple-S XML has been developed which will promote its use (Hughes, Jenkins, and Wright 1999). According to the authors, Triple-S XML is "a language for describing survey metadata – that is, data about the survey data: question and response texts, the location of individual data items within the record, valid ranges for responses, and so on." The standard will enable survey designs to be exchanged between any Triple-S XML compliant software packages, eliminating the need for developers to write import and export routines for every other vendor's program. Questionnaires will be more portable, enabling rapid deployment of the same survey across multiple systems. Triple-S XML is built using XML (eXtensible Markup Language), which is designed to describe what data is—in other words, it is a language for meta-data. XML has applications in many areas, for example to describe the location and possible values for every field on a scannable form. We believe that XML will be rapidly adopted by the survey research industry and will have a profound effect on survey software development.

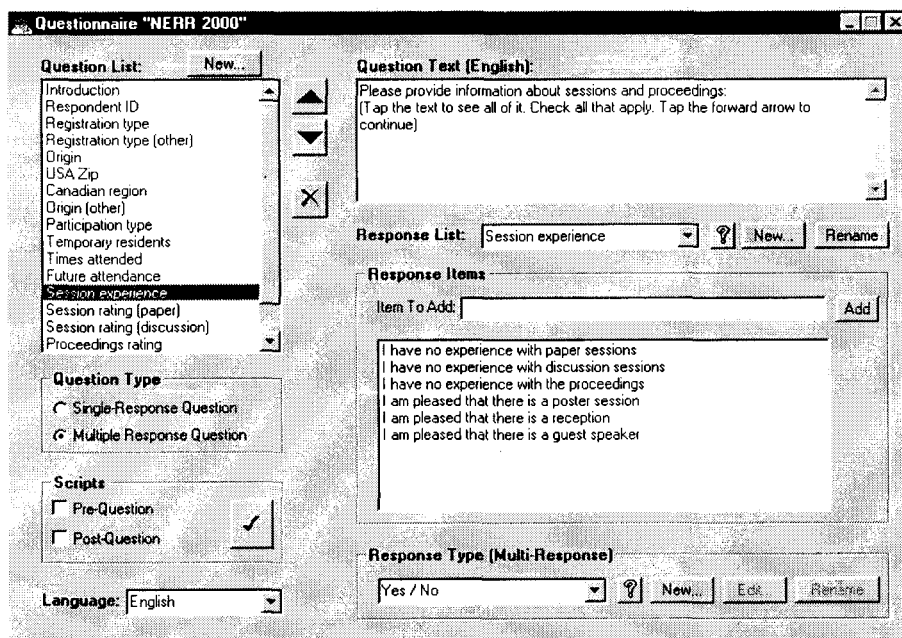
An MCAPI System

How well does a current state of the art MCAPI system address the issues first identified by Parks Canada a decade ago? We will examine a system consisting of the Techneos Survey Workbench™ for Windows 95/98/NT, and Techneos Mobile Interviewer software running on a Palm OS handheld (all current and most out-of-production models are usable).

The functions of the Survey Workbench software include questionnaire design, and data communications and management. The program is used to create a questionnaire, download it to one or more handhelds,

upload and consolidate response data from the handhelds, and export the response data for analysis.

A researcher uses the graphical user interface to create and name a question, which appears in the Question List. A choice is then made between Single and Multiple Response Question Type—this can be changed at any time with one click. Question Text is added, then a Response Type is selected or a new one created. Nothing more is required to create a questionnaire, unless branching, data integrity checks, or calculations are required. The contention that MCAPI has a high overhead for setup compared to PAPI (deLeewun and Nicholls 96) is no longer valid.



The screenshot shows the 'Questionnaire "NEER 2000"' window. On the left, the 'Question List' contains items like 'Introduction', 'Respondent ID', 'Registration type', and 'Session experience' (which is selected). Below this is the 'Question Type' section with 'Single-Response Question' and 'Multiple Response Question' (selected). There are also 'Scripts' for 'Pre-Question' and 'Post-Question' (checked), and a 'Language' dropdown set to 'English'. The main area is 'Question Text (English)' with the text: 'Please provide information about sessions and proceedings: (Tap the text to see all of it. Check all that apply. Tap the forward arrow to continue)'. Below this is the 'Response List' with 'Session experience' selected. The 'Response Items' section shows a list of statements: 'I have no experience with paper sessions', 'I have no experience with discussion sessions', 'I have no experience with the proceedings', 'I am pleased that there is a poster session', 'I am pleased that there is a reception', and 'I am pleased that there is a guest speaker'. The 'Response Type (Multi-Response)' is set to 'Yes / No'.

Sophisticated questionnaires can be created using pre- and post-question scripts to initiate actions. Conditional and unconditional branches will vary the path through the questionnaire based on responses obtained. Messages can be conditionally presented to the interviewer. Range and logic checks can be added to improve the quality of data collected, and new values can be calculated on the fly. The questionnaire designer must deal with variables and expressions to use scripts, but no programming is required.

When the questionnaire file is downloaded to the handheld computer, it includes data that describes each question, response set, and script. The Mobile Interviewer software on the handheld interprets this and displays each question in an appropriate manner. The Mobile Interviewer interface is extremely simple, yet the software offers full non-response tracking, the ability to switch interview languages at any time, and automatic recording of information such as respondent number and interview timestamp.

What is your favourite color?

☐ Red
☐ Green
☐ Blue
☐ Orange
☐ Purple
☐ Yellow

◀

A Single Response question on the handheld. Tapping a checkbox selects that response and advances the survey to the next question

What are your favourite colors?

☒ Red
☒ Green
☒ Blue
☐ Orange
☒ Purple
☐ Yellow

◀ ▶

A Multiple Response question allows more than one response to be checked. Responses can be unchecked. After selecting all appropriate responses, the forward arrow is tapped to advance to the next question

Questionnaires may also be printed. The paper version can supplement use of the handheld, or be used instead. Returned forms can be data entered using the handhelds. This is not the fastest data entry technique, but it tends to reduce data entry errors. Once the data is entered, the Survey Workbench software saves time by directly creating a labeled SPSS data set.

The desktop and handheld programs are both very easy to use because of all the work they do behind the scenes. For example, the Survey Workbench software automatically creates and labels the variables required when creating a question, or when switching between single and multiple response. Proper response labels and values are associated with each question. Questions and response items can be deleted and restored at any time just by clicking a button. Entire questionnaires or individual response lists can be copied for use in multiple questionnaires, assuring consistency across an organization's surveys.

A project mode property provides exceptional control over data integrity. In Draft Mode, any changes can be made to the questionnaire, but response data can not be saved on the handheld. Switching to Pre-test Mode activates warnings when certain changes are attempted that can affect data integrity. It also enables modification logging, where every

change is recorded in detail. Live mode maintains this high level of data integrity checking, and sets the Mode variable included in every interview record to a different value, so that Pre-test and Live data can be easily separated if required. Each interview record also contains a variable allowing precise identification of the questionnaire version that was used to complete that interview.

The high degree of tracking simplifies the consolidation and export of response data. The software assigns each questionnaire a unique identification number, so response data files from different questionnaires are easily distinguished. Changes such as a switch between single and multiple response for a question are resolved automatically when processing the response data for export. Some export formats allow meta-data such as variable and response labels, and question text, to be included with the response values. This makes it possible to create a ready to use SPSS data set, for example, with just a few mouse clicks.

Cost Comparison with Pencil and Paper

Mobile Computer Assisted Personal Interviewing (MCAPI) competes directly with Pencil and Paper Interviewing (PAPI) in situations where data must be collected on site. The two approaches have opposite cost structures:

	MCAPI	PAPI
Initial cost	High - capital investment	Low - existing infrastructure
Incremental cost per interview	Low - interviewer wages	High- interviewer wages plus printing, distribution, data entry, cleaning, data set labeling and formatting

The difference in cost structure means that PAPI is cost-effective for infrequent use and low volumes. MCAPI offers increasing cost efficiencies as the number of projects and interviews rises. The crossover point where MCAPI becomes a better value depends on a number of factors that vary by organization and project. This table shows key

items to consider, and indicates which approach is more cost-effective (+). Costs are *fixed* (F) if they do not change based on the number of projects undertaken; *variable* (V) if they vary by project but not by number of interviews; and *incremental* (I) if related to the number of interviews.

Phase and Cost Type	MCAPI	PAPI
System Purchase (F)	- Software, hardware, training	+ Existing infrastructure
Questionnaire Design (V)	+ Reuse elements (response lists, standard questionnaires)	- Poor control over standard elements
	+ Faster revisions, with tracking	+ Faster for very simple, one-time surveys with few revisions
Printing and Distribution (V, I)	+ Complex questionnaires possible	- Complex designs unworkable
	+ No layout, print, storage. Electronic distribution.	- Layout, print, ship, and store forms. Changes cost the same again.
	+ Automatic tracking of modifications and distribution	- Tracking is difficult and time-consuming
	+ Unlimited inventory at no cost to produce or store	- Time and shipping to get forms where needed; lost interview time
Interviewing (I)	+ No waste, no delays	- Changes produce waste, take time
	+ More efficient for complex or long questionnaires	+ More efficient for long open-ended and roster question types
	+ Better response rates; interviewers and respondents enjoy more	- Paper & clipboard is less efficient and attractive
	+ Data integrity checks ensure more usable interviews	- No response checking results in lost due to bad data
	+ Automated data capture e.g. date and time stamp	- Everything must be manually recorded, and done so accurately
Data Entry Setup (V)	+ Handles multiple questionnaires	- Multiple questionnaires difficult
	+ Not required	- Must reproduce questionnaire error free; redo if questionnaire changes
Data Entry (I)	+ Not required (done by interviewer)	- Additional wages, equipment use. Introduction of errors reduces data quality, may lose some interviews
	Saves time, avoids introduction of errors	- Proper data entry not enforced, so varying amounts of cleaning required
Data Cleanup (V, I)	+ Minimized by designing questionnaire to ensure entry of clean data	- Can identify errors, but too late to get good data; lost interviews
	+ Identify errors during interview and get correct data; more usable records	- Need to reproduce questionnaire design again, error free; redo if questionnaire changes
Data Set Creation (V)	+ Create formatted, labeled SPSS data set, or export to ASCII (no labels). Saves time, eliminates errors	

Some rules of thumb for determining when to use MCAPI instead of paper:

- Use MCAPI for complex questionnaire designs, or when scripting can reduce the interview length for respondents;
- Use paper for many people in a very short time (i.e., to get an adequate sample in the available time, at reasonable cost).

Mobility is the characteristic that distinguishes MCAPI from other data collection methodologies such as phone interviews, mail-out surveys, or web surveys. Mobility is highly desirable in two common situations:

- When the population of interest is most easily reached on site, because they are widely dispersed the rest of the time or have a low incidence in the general population. Park trail users are a good example of this situation.
- When the setting matters. Instead of dealing with anticipation or recollection, you can research an experience while the respondent is in it. Participation tends to be high in this situation. Observational studies are also an excellent option.

It can be seen from this brief overview that the issues with Computer-Assisted Personal Interviewing that have been

raised in the past are generally resolved by current Mobile CAPI systems. The use of handhelds with appropriate software is a viable replacement for Pencil and Paper Interviewing (PAPI) in terms of its capabilities; in fact, it is in many ways superior in terms of data quality, time, and cost. However, like every other survey data collection methodology, the suitability of MCAPI must be evaluated based on the overall requirements of each research project.

(A limited number of screenshots were included in the paper to save space. A free evaluation copy of the software can be downloaded from www.techneos.com).

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WEIGHTING ISSUES IN RECREATION RESEARCH AND IN IDENTIFYING SUPPORT FOR RESOURCE CONSERVATION MANAGEMENT ALTERNATIVES

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Abstract: Sampling for research in recreation settings in an ongoing challenge. Often certain groups of users are more likely to be sampled. It is important in measuring public support for resource conservation and in understanding use of natural resources for recreation to evaluate issues of bias in survey methodologies. Important methodological issues emerged from a statewide project assessing sport fish consumption patterns of state anglers. The objective of the project was to determine an average consumption rate for fish obtained through recreational fishing. Although two methods were used to reach anglers, a mail survey and an on-site survey, the latter method was subject to participation bias among anglers interviewed in the on-site locations. The most active anglers were more likely to be encountered and interviewed by the survey team. As higher participation levels in fishing are likely associated with more opportunities for catching fish, more active anglers are likely to have higher consumption rates. More active anglers' consumption data would contribute to an estimate of average consumption rate calculation that was too high among anglers interviewed in the on-site locations. Weighting data based on the inverse of fishing participation was necessary to address the participation bias, and sport fish consumption was calculated with weights assigned. Comparison of weighted data with unweighted data is provided. Average consumption rate for active consumers assessed using weighted on-site data was similar to the rate observed for active consumers in the mail survey. Weighting was necessary to calculate an estimate of average sport fish consumption among on-site

anglers and to provide information to the funding agency for policy decisions.

Introduction

Sport fish consumption is an issue of importance in human dimensions research based on health and safety issues associated with consuming potentially contaminated fish. Substances that accumulate in fish, such as polychlorinated biphenyls (PCBs), pose a risk for people who eat fish. The risk increases with larger or specific species of fish (Hutchison and Kraft, 1994). Fish consumption patterns are particularly of concern when sport fish form a substantial portion of angler diets and household meals.

Many states have issued fish consumption advisories for specific water bodies. These advisories help anglers choose between site alternatives (Jakus, Downing, Bevelhimer, and Fly, 1997). To set the levels of consumption for advisories, state agency personnel assess patterns of fish consumption by anglers who consume sport fish; this definition does not include fish purchased at a store or restaurant. Certain angler groups are of particular concern if they consume sport fish at higher levels than the general public and are therefore at higher risk from consuming contaminants in fish.

Methodologies can be chosen to reach different segments of the angling population to collect consumption data. Approaches to statewide surveys have varied. Mail surveys targeting licensed anglers may reach a majority of the angling public. Yet subpopulations of anglers, such as anglers who do not purchase licenses, may not be represented in survey data. For example, a statewide survey in Wisconsin had indicated a general compliance with the consumption advisory, but potentially overlooked ethnic minorities (Hutchison and Kraft, 1994). Diaries have been used to assess awareness of advisories and fish consumption behaviors (Connelly, Knuth, and Brown, 1996). In the Great Lakes region, several states, such as Michigan (West, Fly, Marans, Larkin, and Rosenblatt, 1995) and New York (Connelly et al., 1996) as well as the province of Ontario have collected fish consumption data; however as of 1997, no comprehensive data had been collected of consumption of fish from Indiana state waters. For this reason, the Indiana state Departments of Environmental Management, Health, and Natural Resources initiated efforts through researchers at Purdue University to conduct a statewide fish consumption project.

When measuring fish consumption levels, it is important to address variation in the estimates based on use of different methods and variables (Cavan, Gibson, Cole, and Riedel, 1996). Biases inherent in a particular methodology need to be considered. In on-site interviews, participation bias will affect fish consumption calculations, because highly active anglers are more likely to be interviewed. Weighting is used to address this bias and correct the data for a more accurate estimate of the measure of interest, namely average consumption rate by sport anglers in a region.

Need for Weighting On-site Interview Data

The use of weighting must be considered carefully. This has been noted for making inferences from recreation research (Christensen, 1979). Often the reason for using weighting is to correct for selection bias (Whitehead, Groothuis, Hoban, and Clifford, 1994). Weighting has been identified previously as an issue in food consumption research (Tucker, Bianchi, Maras, and Bermudez, 1998) and in nutrition surveys (Osler and Schroll, 1992). It has been used to avoid bias in certain estimates resulting from those of higher social status, such as higher-income groups participating at a different rate (e.g. times per year) than others in the population (Harou, 1982). Among those interviewed onsite it may be necessary to correct for a 'travel time bias' in making particular estimates of use (Wna, 1989). Weighting may also be employed to correct for differing variability in observations. In one case of using weighted least squares estimation the issue is getting more reliable estimates not removing bias (Beaman, Knetsch and Cheung, 1977).

In recreation research, the selection of a respondent often depends on the level of participation in a recreational activity at a location. Onsite survey methods must be designed with due consideration of how respondents are selected and how this should impact on their contribution to getting unbiased estimates of a particular measure of interest. How respondents are selected can result in unweighted averages of expenditure and person days of site use both being biased. Getting unbiased estimates requires 2 different weighting schemes.

If different respondents exhibit a different level of participation based on some measure, e.g., visits, and respondents are selected for interview on final exit, one must consider what measures to estimate to meet various survey objectives. Some people visit a site only 1 or 2 times a year but may stay for 2 weeks one of those times. Others make repeated visits to a place (every nice weekend for 15 or 20 weekend and day-visits). This is an issue when measuring use at national parks, at forest areas or at specific fishing sites (Beaman and Redkop, 1990; Price, 1991; Roeder, 1973).

Methods

The 1997-1998 Indiana sport fishing consumption survey questionnaire and administration methodology was designed based on past fish consumption research. A literature review was conducted focusing on past work on fish consumption patterns among anglers. A variety of survey methodologies have been used in the past, such as mail questionnaires, diaries and personal interviews. Calculations of consumption rate, specific wording of questions for variables to be measured, and visual aids were particularly noted within these methodologies. Based on discussions with the state agency and respective committees, two methodologies were selected: a mail survey of licensed anglers, and an onsite survey of anglers fishing in lakes and/or rivers near urban regions. It was deemed important to develop an on-site survey to reach angler segments potentially overlooked in the mail survey,

such as non-licensed anglers, retirees who are not required to buy a license and minority groups fishing for subsistence purposes. An attempt was made to reach minority and lower income anglers by focusing on urban areas where the proportion of the population in these groups was higher than in non-urban areas. Survey locations were fishing places easily accessible to East Chicago, Hammond, and Fort Wayne in the north, Indianapolis in the central region, and Jeffersonville and Evansville in the southern part of the state. It is the on-site project that is the focus of this discussion. Weighting was necessary to correct for participation bias from highly active anglers who were more likely to be sampled in the on-site locations.

Variables

Two variables needed to calculate consumption rates are typical portion size and how often a respondent ate fish for a meal based on a specified recall period, such as number of meals per week in the past month. Recall periods found in the literature range from weeks to years. A three-month recall period was chosen for the Indiana project, and within that time frame respondents chose meal frequencies, e.g., once a week. In addition, a third variable, fishing frequency, was also measured in the Indiana project to determine level of fishing participation. Questions used for measuring consumption rate and fishing activity were:

- 1) "In the last three months, how often did you go fishing in Indiana waters?" (A six-point scale ranged from less than once/month to 5-7 days/week.)
- 2) "In the last three months, how often did you eat Indiana sport fish?" (A six-point scale ranged from less than one meal/month to 5-7 meals/week.)
- 3) What portion size would you say that you normally consume in a typical meal (An eight point scale ranged from less than 4 oz. to 16 oz., and respondents were given four photographs of 6, 8, 10, and 12 oz. fish portions as visual aids).

Respondents who noted both a typical portion size and a meal frequency during the three month recall period were defined as active consumers. Respondents who indicated a typical portion size but selected "never" as the response for how often they ate fish in the last three months were defined as potential consumers. These potential consumers were assumed to eat fish at other times of the year.

Calculating Consumption Rate

Calculation of consumption rate was based on the method used by Meredith and Malvestuto (1996). The result is presented as grams per day (GPD). The calculation used to determine an angler's gpd was:

$$C_{\text{daily}} = \frac{(ps) (m) (28.35 \text{ grams/oz})}{30}$$

Where: C_{daily} = daily consumption of sport fish (ounce)
ps = portion size (ounces)
m = number of meals per month
less than once a month m = 0.5

Once a month	m = 1
2-3 days a month	m = 2.5
Once a week	m = 4
2-4 days a week	m = 12
5-7 days a week	m = 24
Not at all	m = 0

Weighting Consumption Data

It was important to correct for the bias from highly active anglers when calculating the consumption rate for sport fish among Indiana anglers interviewed in the on-site survey. Those who fish frequently were more likely to be selected by personal interview of people actively fishing in an on-site survey than those who fish infrequently. Computing an unweighted average of consumption rates across all respondents would have resulted in an artificially high consumption rate value. For this reason, it was necessary to weight consumption rates to correct for this frequency bias. This is achieved by weighting each respondent by the inverse of some fishing activity rate. Table 1 shows the weights that were assigned to each case by using the inverse of the fishing frequency measure obtained for the recall period.

Table 1. Weights assigned to on-site respondent data.

Variable Response	Code for fishing frequency/month	Weight Assigned
< Once/month	0.5	1/0.5 = 2
Once/month	1	1
2-3 times/month	2.5	0.4
Once/week	4	0.25
2-4 times/week	12	0.0833
5-7 times/week	24	0.0417

Findings

Average consumption rates for respondents of the Indiana on-site and mail surveys are given in Table 2. By our definition, active consumers had recently eaten fish (in the last three months). Potential consumers had not eaten fish in the last three months, so their consumption rate value was zero; however they indicated a typical portion size suggesting that they do consume fish. Therefore their zero consumption rates were incorporated into the average. When weights were assigned to the on-site data, the on-site active consumers (22.9 gpd) showed an average consumption rate that is very similar to that observed in the mail survey (19.8). In contrast, presenting the data without assigning weights would have led to the conclusion that on-site anglers are consuming fish at a higher rate than respondents to the mail survey. Such an estimate would have been too high as a result of the bias introduced by interviewing too many active anglers at the on-site survey locations.

Table 2. Average consumption rates by respondent type.

Survey Method	Active Consumers		Potential and Active Consumers	
	Onsite	Mail	Onsite	Mail
GPD Weights Assigned	22.9	19.8	9.8	16.4
GPD Not Weighted	32.3	19.8	17.9	16.4

Weighting was necessary to eliminate bias and thus get reasonably accurate estimates of the grams per day calculation average across income levels of interest. Four income categories were compared to assess potential differences in average consumption rates by anglers in each group and determine if anglers with lower incomes are consuming higher levels of sport fish. Data in Table 3 show that those with incomes less than \$25,000 are consuming on average the same amount of fish (18.9 gpd) as those in the second category (18.8 gpd), and are actually consuming less than anglers in the highest income category (48.9 gpd). Getting weighted estimates shows that the difference in consumption rate between the highest and lowest income groups is greater than would have been concluded using data presented without weights assigned.

Table 3. Consumption rate by income among active consumers.

Income Level	<\$25,000	\$25,000-34,999	\$35,000-49,999	\$50,000 or more
GPD Weights Assigned	18.9	18.8	15.2	48.9
GPD Not Weighted	30.4	26.9	29.3	41.3

Consumption rates were compared across racial groups using the categories of white and minority active consumers. When weights were assigned to the data, findings showed that minority anglers were consuming significantly higher levels of sport fish (Table 4). A significant difference would not have been recognized using unweighted data (Table 5).

Table 4. GPD for active consumers by race, weights assigned.

Race	N	Mean	Std. Dev.
White	177	20.0	33.0
Minority	143	27.2	45.7
Significance (p-value): 0.000			

Table 5. GPD for active consumers by race, weights not assigned.

Race	N	Mean	Std. Dev.
White	177	27.8	39.5
Minority	143	38.3	55.9
Significance (p-value): >0.05			

Discussion and Implications

This research provides an example of the potential impact of biases in research conducted in recreation settings. On-site interviews have a frequency of participation or length of stay bias that can be corrected by weighting techniques to provide unbiased or less biased estimates of the measure of interest. Considerations of bias should be made at the outset, before the research project begins. Having collected data one may find that they can only produce biased estimates with no idea of the magnitude. Preplanning will hopefully result in collection of appropriate data for bias correction or selection of a method for which bias correction is not necessary for estimates of concern. Whether or not to use weighting depends on the measure of interest. In the fish consumption project the objective of the agency was an average measure for on-site anglers statewide. Selection of the weighting method and other methodological issues depends on the sample, and what is to be estimated which, of course, depends on the purpose of the study. Continued discussion of weighting can help promote its use where necessary.

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INTERVENTION FOR THE COLLABORATIVE USE OF GEOGRAPHIC INFORMATION SYSTEMS BY PRIVATE FOREST LANDOWNERS: A MEANING-CENTERED PERSPECTIVE

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Abstract: Private forest landowners support the stewardship objectives that can be achieved through ecosystems-based management. However, ecosystems-based management is a data intensive approach that focuses upon the broad forest landscape. Intervention by forestry agents or agencies could help neighboring landowners to collaborate with an ecosystems-based approach in pursuit of their stewardship objectives, using Geographic Information Systems as a tool. A typical means of intervention is the information-based approach, but this runs the risk of imposing a tyranny of the elite, where the information is presented as a means of technocratic or political control. Favoring empowerment over control as the preferred intent of intervention, we used a meaning-centered perspective to evaluate the impact of a workshop for private forest landowners featuring GIS collaboration in a role-playing simulation. Surveys and interviews assessed the ingredients for meaningful learning—conceptual background of the learner, motivation, and meaningful materials—and subsequent thinking, feeling, and acting by workshop participants. Meaningful learning occurred as participants understood the conceptual principles used in the role-playing simulation, yet the relevancy of the simulation was in question because landowners did not envision a high likelihood of collaborating with neighboring landowners. Motivations of the learner had the most impact upon the subsequent thinking, feeling, and acting indicative of the empowerment to pursue their objectives. Forestry agents or agencies should ensure that private forest landowners are motivated to learn about GIS, and that a venue for collaboration is set, before assisting with an ecosystems-based management approach.

Ecosystems-based Management for Private Forest Landowners

Ecosystems-based management targets the mosaic of ecosystems within a broad landscape as the appropriate scale for resource management decisions (Franklin 1992; Salwasser, MacCleery et al. 1992; Sample 1994). This scale of management fits well with the mission of resource agencies that manage large tracts of land, such as the Forest Service (Robertson 1992). In contrast, much of the forested Northeast consists of numerous small woodland

parcels separately managed by private landowners (Birch 1996). Studies indicate that small private landowners support the stewardship objectives that ecosystems-based management could promote (Birch 1989; Jones, Luloff et al. 1995; Sinclair and Knuth In press). However, the advantages of scale for large agencies turn into problems of scale for private landowners whose management concerns correspond to just a small piece of the broader forested landscape.

An ecosystems-based approach places a large demand upon data that can be used to monitor, model, and map a variety of natural resource and land cover features spatially. A Geographic Information System (GIS) is viewed as an important tool for processing data at the landscape scale to meet this demand (Prevedel, Winn et al. 1993). Among the attributes of GIS suited to the demands of ecosystems-based management are:

- the inventory and classification of natural resources, the ability to use these data to devise management plans, and the ability to monitor management effects (Heit and Shorttreid 1991; Franklin 1994);
- combining layers in various ways to generate new layers of data, integrating input into comprehensive output (Flamm and Turner 1994); and
- incorporating scales affecting any size area, projected over any length of time, and reflecting various multiple uses (Bailey and Avers 1993).

Small private forest landowners lack the resources available to large agencies; expecting every landowner to possess and use GIS is unrealistic. Collaboration among landowners would be a practical solution, both in terms of shared resources and the larger area affected by their decision-making. However, one study done in Connecticut (Sinclair and Knuth In press) indicates that landowners have little previous experience collaborating at the landscape scale.

During the Plainfield, Massachusetts Pilot Project GIS was used for collaboration among multiple forest landowners with reported success (Campbell and Kittredge 1996). With assistance through the intervention of university-supported training, participants realized benefits such as sharing ideas, minimizing forest impacts, and minimizing conflicts of objectives. Without this type of intervention private forest landowners will find it hard to collaborate using GIS, and may not be able to best pursue the stewardship objectives they support. Outside intervention, however, is not always welcomed in matters concerning private land ownership. Our study examined the effects of intervention in the collaborative use of GIS from a meaning-centered perspective.

Approaches to Intervention

Sample (1993) reported the results of a workshop which gathered together forest agencies, industries, academics, consultants, and landowners to explore effective means of mixed ownership collaboration towards ecosystems-based management. Three approaches to intervention were discussed. Landowners resented the regulatory-based

approach and were skeptical of the incentives-based approach. Favored by landowners was the information-based approach, regarding which Sample (Sample 1994, pg. 43) concluded, "Providing education and technical assistance to private landowners offers a major opportunity for achieving ecosystem management objectives at low cost."

Information-based approaches are implemented with varying intent and varying effects, not all of which benefit the receiver of information. Unfortunately, approaches involving technology have a history of dubious intent. Other studies have revealed that what we call a tyranny of the elite often accompanied the introduction of sophisticated computer technology for tax assessments and other municipal functions (Danziger, Dutton et al. 1982; Kraemer 1985). These black boxes carried a mysterious aura of technical neutrality, yet the elite managers and/or technocrats that controlled the technology manipulated inputs fed into the black box to achieve outputs of information that fit their agenda. Regarding private forest landowners, GIS represents the black box that could be used by a political or technocratic elite to control a forest management agenda.

Education theories acknowledge intervention as part of the educative act, with the educator serving as intervener, but do not promote control as the motive for intervention. Earlier theories of education this century such as behavioral learning (Skinner 1954) and developmental learning (Piaget 1970) placed an emphasis on processes of learning that were external to the idiosyncrasies of the learner. This way of thinking calls upon experts to develop curriculum and instruction based upon external considerations such as a stimulus-response interaction. The intent of such an approach, driven by the educator in consideration of what is best for the learner, can be viewed as enlightenment.

To what extent does enlightenment differ from control? In the minds of those educators known as critical theorists (Apple 1979), there is little difference. According to their concerns the intent of most educative acts by political institutions, such as the state-sponsored public school system, is to create a citizenry that will support the current political structure and behave in certain ways. Intent to enlighten becomes the same as intent to control. As long as educative acts are designed independently from the idiosyncrasies of the targeted learners, this danger exists. Neither enlightenment nor control has to be the intent of outside intervention in an educative act. Ausubel formulated an assimilation theory of learning which claimed that an educative process starts with what the learner already knows and introduces meaningful materials that can be linked to this knowledge, providing that the learner is motivated to create these linkages (Ausubel, Novak et al. 1978). This idiosyncratic, meaning-centered approach contrasts with the behavioral and developmental approaches to learning.

The internal role of meaning and the idiosyncrasies of a learner's cognitive structure influenced Novak's work on conceptual learning (Novak 1977). Novak claimed that the

goal of education was not enlightenment but to empower learners with the ability to link new concepts into their unique cognitive structures, according to their own motivation. An educative event helps learners learn how to learn what they want to learn.

With this view, successful outside intervention with the collaborative use of GIS towards forest management would educate by empowering private forest landowners with how to learn what they need to meet their stewardship objectives. Any forestry agent or agency facilitating collaboration with GIS needs to understand the educative ingredients that lead to empowerment rather than enlightenment.

Study Rationale

What kind of guide can forestry agents or agencies use to determine the educative ingredients necessary for empowering private forest landowners with "learning how to learn?"

Gowin's theory of educating, which draws upon Ausubel's and Novak's work, emphasizes that the intervention of an educative act affects thinking, feeling, and acting in the learner (Gowin 1981). While these three educative outputs together (as opposed to the one output of affecting thinking) provide evidence that an educative act has empowered the learner, we still need to consider the inputs. For example, one could be induced into action through forced rote repetition of a doctrine (i.e., brainwashing). Determining whether learners have "learned how to learn" requires that their cognitive background and motivation allowed for the assimilation of meaningful intervention affecting the three outputs of thinking, feeling, and acting.

In the spring of 1998 a workshop provided to private forest landowners in Connecticut featured the use of GIS towards forest management, including a collaborative role-playing simulation. We examined the effects of this intervention from a meaning-centered perspective, to determine whether such workshops hold the potential for private forest landowners learning how to learn what they need to meet their forest stewardship objectives.

Methods

We conducted a workshop titled "The Use of GIS for Private Forest Management" at the Housatonic Valley Association office in Cornwall Bridge, CT, in April 1998. Invitations were sent to landowners on the mailing lists of the University of Connecticut Cooperative Extension with 25 acres or more of woodlands, and to members of the Housatonic Valley Association residing in Connecticut.

Twenty people were present, including three presenters and seventeen attendees. The first presentation, by a forester from the Cooperative Extension, demonstrated how GIS can be utilized to generate maps for forest management plans. The second presentation, led by a GIS consultant, reported on the use of GIS to classify forest types from satellite imagery. The third presentation, led by a graduate

student in the field of Natural Resources, involved a simulation where participants role-played neighboring forest landowners using GIS to generate forest management zones. In addition to the presentations, attendees received an overview regarding the status of GIS in the state of Connecticut and information regarding how to access digital spatial data over the Internet.

During the role-playing simulation participants used ArcView 3.0a (ESRI 1996) software with a laptop, LCD panel, and 48-inch screen to examine a wooded geographic area in Connecticut. Roads, hydrography, and tax parcel boundaries formed the base map for the area. Other datalayers included critical species, wetlands, trails, scenic roads, and streams, representing a variety of ecological and social interests affected by forest management.

Participants were split into eight groups, each one corresponding to a different forest landowner with a woodland parcel located in the simulation area. Roles were evenly divided between owners of parcels 100 acres or larger and 50 acres or smaller, and between those with mainly an economic interest in their woodland and those with mainly an ecological interest. The groups had to weight the importance of the different natural resource features used in the simulation, and had to assign percentages to how much of the landscape should be placed in each of three zones:

1. preservation;
2. multiple-use with emphasis upon social and ecological interests; and
3. multiple-use with emphasis upon sustainable harvest.

One module prepared for the simulation used the weights assigned to the natural resource features to generate a map

of high values in close proximity to highly weighted features, with values decreasing in proportion to the distance away from these features. Another module used these values to generate three management zones, based upon the percentages provided, with the highest value areas of the landscape falling within the preservation zone. Participants witnessed the effect of sample feature weightings and management zone percentages on the resulting value landscape. They subsequently collaborated to generate their own unique landscape of forest management zones.

Fifteen attendees (four of the seventeen attendees were couples) filled out a survey at the beginning of the workshop that assessed their prior knowledge and experience with maps, GIS, forest plans, and collaboration. At the end of the workshop ten attendees filled out an evaluation of the value landscape simulation; some attrition resulted from the workshop lasting longer than advertised.

Three months after the workshop, interviews were conducted with six of the attendees to explore in depth the impact of the workshop, using as a framework Ausubel's theory of meaningful learning and Gowin's theory of educating. Transcribed interview responses were fitted to a matrix with categories generated from the framework theories. Conceptual Background, Motivation, and Meaningful Materials were categories generated from Ausubel's assimilation theory of meaningful learning. Thinking, Feeling, and Acting were categories generated from Gowin's theory of educating. This matrix was analyzed to determine which steps in the educational process were key for empowering the workshop participants towards meeting their forest stewardship objectives (Table 1).

Table 1: Matrix used for analyzing responses to questions assessing the impacts of a GIS workshop upon meaningful learning and educating.

General Background	Conceptual Background	Motivation	Meaningful Materials	Thinking	Feeling	Acting
Landowner 1 Acres Years Owned Land Trust?	Forest plans? Computers? Maps? Collaboration ?	Stewardship? GIS? Other?	Understanding? Relevancy?	Plan maps? Classifying? Simulation? Data? Technology?	GIS? Collaboration?	GIS? Collaboration?

Results

General Background: Survey Respondents

Attendees at the workshop owned an average of 50 acres, with a range of 10-140 acres, for an average of 19 years, with a range of 4-67 years. Twelve of the fifteen survey respondents were familiar with the term GIS, though only seven had worked with maps and/or images of their woodland and only four had ever considered using GIS for forest management. Eleven respondents had never collaborated with other landowners but might if they had the opportunity; the remaining four had collaborated with other landowners in the past and would do so again. Only three respondents had ever obtained information regarding how the management of other woodlands affected theirs,

and only two had obtained information regarding how the management of their woodland affected the surrounding landscape.

Conceptual Background: Interviewees

Of the six interviewees, half owned woodland of 90 acres or more and half owned woodland of 35 acres or less. Interviewees had some experience with at least two of the following categories: forest management plans, computers, maps, or collaboration with other landowners. All had previous experience with maps, while only one had previous experience with collaboration.

Motivation: Interviewees

Regarding motivation for attending the workshop, five interviewees referred to their stewardship values and a desire to seek out any information that might help them manage their woodlands better, while four specifically referred to their interest in the technological and/or cartographic aspect of the workshop. These four interviewees will be referred to as the "GIS-motivated." One interviewee confided he attended mainly to gather whatever "freebies," including free consultations, might be made available.

Meaningful Materials: Survey Respondents

Out of the ten respondents completing the evaluation of the role-playing simulation, eight agreed somewhat or strongly that GIS displays information in a manner that they could easily understand, whereas two disagreed somewhat. Eight of the ten agreed somewhat or strongly that they understood how ecological and social features were used to determine forest value in the simulation, and how landowner preferences for different forest management goals were used to determine forest management zones from a landscape of forest values. Seven respondents agreed somewhat or strongly that GIS is a tool that can help landowners collaborate regarding forest management. Only four agreed somewhat or strongly that GIS could provide information relevant to their forest management goals. Four also agreed somewhat or strongly that their willingness to collaborate with others would increase if GIS was used as a tool.

Meaningful Materials: Interviewees

All the interviewees found the information presented at the workshop understandable. Three of the GIS-motivated found the information relevant to their forest management interests, while the fourth stipulated that his woodland was too small and his neighbors not interested enough to make the information relevant at his scale. The other two did not find the GIS presentations relevant to their forest management goals.

Thinking: Interviewees

When prompted for their thinking regarding the workshop presentations, all the interviewees recalled something they found of interest at the workshop. Everyone was interested in the use of GIS to make maps of their woodlands, and all but one was interested in how GIS could be used to make forest classifications based upon satellite imagery. Only the four GIS-motivated recalled with interest the use of GIS for forest management collaboration. Three of these four also suggested forest management objectives for GIS use that were not emphasized at the workshop. These objectives included establishing wildlife corridors, plotting trails, managing witch hazel, and modeling defoliation.

Feeling: Interviewees

Three of the GIS-motivated interviewees indicated personal felt-significance to the use of GIS; one thought it would be valuable for mapping his woodland (including orchards), one thought it could assist him in expressing his forest management objectives succinctly; and one cited personal objectives for his woodland that he thought would benefit from the use of GIS. The rest felt that GIS would be

valuable for objectives encompassing a large forested landscape, as might be the purview of a Land Trust or large landowner, but that their own woodland parcels were too small and their neighbors too disinterested to warrant the use of GIS in their own situations.

Acting: Interviewees

Three of the four GIS motivated had taken some subsequent action regarding GIS. Two of these three visited the Internet to access GIS-related sites. One mentioned that GIS now enters into his conversation with others regarding forest management. The fourth GIS-motivated interviewee indicated he needed more time before subsequent action. The remaining two interviewees had taken no subsequent GIS actions, nor had they any intention of doing so.

GIS Concerns: Interviewees

All interviewees were asked about their possible fear that the use of GIS for forest management could come under the control of an agent or agency that would use it to impose their agenda and subvert the forest management objectives of the interviewees. All six responded that the use of GIS could only be a positive, with four countering that GIS would more likely prevent anyone from being able to impose their agenda upon others.

Discussion

Meaningful learning occurs if learners have the conceptual background necessary to assimilate new concepts, and the motivation to do so. Pre-workshop surveys indicated a minority of private forest landowners had previous experience working with maps or images, but almost all were familiar with the term GIS before the workshop, and all had experience working with computers. Though only a small minority had obtained data regarding the effects of forest management across ownership boundaries, all were receptive to collaborating with other forest landowners. Thus, the conceptual background and motivation existed for meaningful learning to occur regarding GIS collaboration.

Educational materials become meaningful if they are understandable and relevant to the learner. The role-playing simulation at the workshop was our strategy for making the use of GIS for private forest landowner collaboration understandable. Our post-simulation survey indicated that most participants understood the process of how GIS was used to generate forest value and forest management zones, which implies that the use of GIS for forest management collaboration escapes the enigma of the black box.

The maps produced from an input of spatial data are less mysterious than, for example, assessment values produced from an input of numeric data.

However, the post-simulation results also indicated that the use of GIS would not be relevant to the participants in the pursuit of their own forest management goals. The lack of relevancy may relate to the perceived value of GIS for private forest management, the value of collaboration, or

both. This became a question that the post-workshop interviews helped to address.

All six of the people interviewed found the materials presented at the workshop understandable, and all thought GIS could only be a positive tool if brought into a forest management situation that involved collaboration. However, all indicated little prior experience and slim future prospects of collaborating with others across a larger forest landscape, even though they were willing to do so. Two interviewees mentioned that collaboration might be a possibility only if an agency such as a local Land Trust was involved. GIS appears to be a legitimate tool for ecosystem-based management in the eyes of private forest landowners, but its relevancy is diminished because of limited opportunities for collaboration.

The six people interviewed all had the potential for meaningful learning to occur, based upon their previous background with forest management plans, maps, computers, and/or collaboration. All indicated that meaningful learning did occur. However, motivations differed regarding attendance at the workshop, which had a distinct effect upon their subsequent thinking, feeling, and acting. Those interviewed who were motivated to attend because of the technological aspects of the workshop had thought about the unique applications of GIS relevant to their own particular interest, felt that GIS could assist them with their own small woodland parcels, and had taken GIS-related action subsequent to the workshop.

The workshop educated the GIS-motivated as evidenced by the positive effects upon thinking, feeling, and acting. Intervention led to empowerment, in the sense that those motivated to learn more about GIS came away with an enhanced ability to pursue and benefit from the use of GIS. Such empowerment did not occur for those whose attendance was not motivated by learning more about GIS.

Implications

At the time that the Forest Service proclaimed Ecosystem Management to be their new operating philosophy (Robertson 1992) many thought that a Unix workstation was needed to accommodate the data storage and processing associated with GIS. The software was expensive and required the knowledge of hundreds of commands. If private forest landowners wanted to pursue stewardship objectives through the data intensive practice of ecosystems-based management, they might have easily succumbed to the tyranny of the elite. Even an information-based approach to intervention could be a means to control the decisions of landowners wholly dependent upon the resources of those with a technocratic or political agenda:

Since then, readily available PC hardware has become sufficiently powerful, and GIS software sufficiently user-friendly, to make GIS accessible for use by small private forest landowners. Our findings indicate that the conceptual background of private forest landowners, their motivations, and their ability to understand GIS output all

contribute to meaningful learning that could empower their use of GIS as a tool for their objectives.

However, private forest landowners find little motivation or relevancy in determining how their woodland relates to the larger forested landscape, or in collaborating with others. Without this ingredient for meaningful learning GIS becomes an impractical tool for ecosystem-based management regardless of its accessibility. Rectifying this problem still calls for some form of information-based intervention.

In order that GIS intervention escapes the tyranny of the elite and empowers private forest landowners to meet their own objectives, our findings suggest the following:

- the motivation for learning how to apply GIS to forest management situations must be established prior to providing hands-on experience; and
- the relevancy of GIS collaboration must be evident, mainly in regards to feasibility, for pursuit of objectives.

These suggestions result from evaluating the impact of intervention from a meaning-centered perspective, applying theories of meaningful learning and educating to determine the potential for information-based intervention to empower rather than control. We recommend this approach for agents and agencies responsible for the guidance of stakeholders in natural resource management.

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ESTIMATING SOCIAL CARRYING CAPACITY THROUGH COMPUTER SIMULATION MODELING: AN APPLICATION TO ARCHES NATIONAL PARK, UTAH

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Abstract: Recent research and management experience has led to several frameworks for defining and managing carrying capacity of national parks and related areas. These frameworks rely on monitoring indicator variables to ensure that standards of quality are maintained. The objective of this study was to develop a computer simulation model to estimate the relationships between total park use and the condition of indicator variables. In this way, the social carrying capacity of parks might be estimated more proactively.

Introduction

Carrying capacity is a perennial issue in parks and outdoor recreation. Recreation can cause impacts to park resources (e.g., compaction and erosion of soil, destruction of groundcover vegetation) and the quality of the visitor experience (e.g., crowding and conflicting uses). Carrying capacity addresses the amount of recreation-related impact and associated visitor use that can ultimately be accommodated in parks and outdoor recreation areas. Carrying capacity is becoming increasingly important in the national park system where annual visits will soon surpass 300 million.

This study addresses application of carrying capacity to Arches National Park, Utah. Previous research has led to establishment of selected indicators and standards of quality for major attractions within the park (National Park Service 1995; Manning et al. 1996a). For example, to avoid unacceptable levels of crowding, the number of people-at-one-time (PAOT) at Delicate Arch should not exceed 30 more than 10 percent of the time. But how many visitors can be allowed to hike to Delicate Arch before this standard of quality is violated? Moreover, how many visitors can be allowed in the park before standards of

quality are violated at this and other attraction sites? Computer simulation models of visitor use were developed to help answer these and related questions.

Background for the Study

Overview of carrying capacity

In studying the effects of increasing recreation use, researchers and managers were initially concerned about environmental impacts as measured by such variables as soil compaction, vegetation decline, and change in wildlife behavior. Using a well-known concept in natural science, recreation researchers started to think of these impacts in terms of carrying capacity. The central idea of carrying capacity is that there is a limit to the amount of use a resource such as a park can accommodate. As researchers explored the issue further, it soon became obvious that there were impacts to the visitors' experience as well as environmental impacts (Wagar 1964). The intuitive idea is that the presence of increasing numbers of visitors affects the quality of the outdoor recreation experience, and this is often referred to in the literature as social carrying capacity.

Contemporary carrying capacity frameworks in outdoor recreation have taken a management by objectives approach to defining and managing this issue. Management objectives are formulated for the degree of resource protection and the type of recreation experience desired. These management objectives are made operational through a set of indicators and standards of quality (Manning 1999). Indicators of quality are defined as measurable, manageable variables that reflect the essence or meaning of management objectives. Standards of quality are defined as the minimum acceptable condition of indicator variables. Indicator variables are monitored over time, and management action is required to ensure that standards of quality are maintained. Frameworks that use this approach to defining and managing carrying capacity include Limits of Acceptable Change (LAC) (Stankey et al. 1985), Visitor Impact Management (VIM) (Graefe et al. 1990), and Visitor Experience and Resource Protection (VERP) (National Park Service 1997).

While these carrying capacity frameworks have been successfully applied in a number of park and recreation areas, a potential weakness of this approach to carrying capacity is its arguably reactive nature. That is, it relies on a monitoring program to determine when standards of quality are violated, or are in danger of being violated. A more proactive approach to managing carrying capacity would be to estimate the level of visitor use that will cause standards of quality to be violated, and to ensure that such levels of visitor use are not allowed. Computer simulation modeling has the potential to facilitate a more proactive approach to defining and managing social carrying capacity.

Overview of simulation modeling and applications to outdoor recreation

Simulation modeling is the imitation of the operation of a real-world process or system over time. It involves the generation of an artificial history of a system, and the

observation of that artificial history to draw inferences concerning the operating characteristics of the real system. Simulation modeling enables the study of, and experimentation with, the internal interactions of a complex system. The approach is especially suited to those tasks that are too complex for direct observation, manipulation, or even analytical mathematical analysis (Banks and Carson 1984, Law and Kelton 1991, Pidd 1992).

The most appropriate approach for simulating outdoor recreation is dynamic, stochastic, and discrete-event, since most recreation systems share these traits. Models that represent systems as they change over time are *dynamic* models, differing from static models that represent a system at a particular point in time. Complex and highly variable systems are often modeled using *stochastic* simulation. A stochastic simulation model contains probabilistic components and takes into account the random variation of systems over time. *Discrete-event* simulation models are dynamic models that imitate systems where the variables change instantaneously at separated points in time. This contrasts with continuous systems where variables change continuously over time. A mountain stream is usually modeled as a continuous system, where variables such as stream flow change continuously over time. An example of a discrete-event system is a campground: variables, such as the number of campers, change only when there are campers arriving or departing.

From the mid-1970's to the early-1980's, researchers explored computer simulation modeling as a tool to assist recreation managers and researchers (Manning and Potter 1984, McCool et al. 1977, Potter and Manning 1984, Schechter and Lucas 1978, Smith and Headly 1975, Smith and Krutilla 1976). The main goal of the Wilderness Travel Simulation Model, as it came to be known, was to estimate the number of encounters that occurred between recreation parties in a park or wilderness area. The model required input variables such as typical travel routes and times, arrival patterns, and total use levels. Outputs included the number of encounters between visitor parties of various types and the date and location of encounters. Initial tests established the validity of the model, but the model soon fell into disuse. Computers were relatively inaccessible at the time, and the evaluative component of carrying capacity research had not yet produced defensible numerical standards of quality.

Recent changes in computing power complemented advances in evaluative research to provide the context and impetus for the present study to revisit computer simulation for recreation research and management. Simulation-capable computers have become "smaller, cheaper, more powerful and easier to use by non-specialists" (Pidd 1992, p. 3). Exponential growth in the power of personal computers has facilitated the use of graphic user interface and visual interactive modeling technologies to make the simulation process accessible to non-specialists (Pidd 1992). These advances have led to the wide proliferation of simulation in the fields of business management and manufacturing.

In the 1990's there was renewed interest in applying simulation approaches to outdoor recreation management. Studies at Acadia National Park (Wang and Manning 1999), Yosemite National Park (Manning et al. 1998a, Manning et al. 1999), Yellowstone National Park (Borrie et al. 1999), and on Alcatraz Island (Manning et al. 1998b) used a simulation approach similar to the Wilderness Travel Simulation Model. These studies involved building models of specific sites or specific activities to determine social carrying capacities within these National Park areas.

The following section describes carrying capacity research at Arches National Park. This ongoing planning and research process provided the opportunity for this study.

Visitor Experience and Resource Protection (VERP) research at Arches National Park

The VERP framework described above was first applied to Arches National Park, Utah (National Park Service 1995). A program of social science research was conducted to help managers formulate indicators and standards of quality (Manning et al. 1995; Manning et al. 1996a; Manning et al. 1996b). The first phase of research addressed potential indicators of quality. Using open- and close-ended questions, visitors were asked to identify variables that contributed to or detracted from the quality of their experience in the park. Several indicators of quality were identified, including the number of visitors at prime attraction sites, including Delicate Arch, The Windows, and Devils Garden.

The second phase of research addressed standards of quality. As part of this study, visitors to Delicate Arch, The Windows, and Devils Garden were asked to rate the acceptability of a series of photographs showing a range of visitors at these sites. These photographs were developed using photo editing computer software (Manning et al. 1996a). Based on study findings, park managers established crowding-related standards of quality at these sites. For Delicate Arch, the standard of quality was no more than 30 PAOT more than 10 percent of the time. For The Windows, the standard of quality was no more than 20 PAOT more than 10 percent of the time. For Devils Garden, the standard of quality was no more than twelve PAOT along a 100 meter section of trail more than 10 percent of the time. Once these standards of quality were established, park staff began a program of monitoring these sites to determine if standards of quality were being maintained.

Given these indicators and standards of quality, information was needed on the relationships between PAOTs and total use levels of the Park. The literature described above suggests that computer simulation may have special applications to the dynamic and descriptive aspects of park use and carrying capacity. The overall purposes of this study were to 1) develop a computer simulation model of total park use that could estimate the relationships between total park use and PAOTs at attraction sites, and 2) test the validity of this computer simulation model.

Methods

Data collection

A variety of methods were employed to gather the baseline data necessary for building a model of visitor travel in Arches. These were vehicle counts with traffic counters, on-site visitor surveys, field visits, and map analysis. In addition, parking lot counts and PAOT counts were conducted to validate model outputs. These are described in more detail below.

Data on how many and what time visitors entered the Park were gathered using a traffic counter at the Park entrance. Data were gathered for a seven-day period in the summer of 1997, from August 19 through August 25. Total daily vehicle entries for these seven days averaged to 1346 per day.

Information on visitor characteristics and travel patterns were gathered with on-site survey instruments in the summers of 1997 and 1998. In 1997 426 vehicle travel questionnaires were administered to visitors exiting the Park on August 14, 16, 20, 25, 26 and 30. These were administered from 7:00 a.m. to dusk. Safety concerns preempted surveying after dark. In the same year 180 hiking questionnaires were administered to visitors returning from their hikes to Delicate Arch on August 15, 18, and 24. In 1998 160 questionnaires were administered to tour bus drivers on 42 days between July 9 and October 22. Also in 1998 245 hiking questionnaires were administered to hikers returning from their hikes around The Windows on July 18, 19, 27, and August 2 and 3. Likewise in 1998 320 questionnaires were administered to hikers returning from their hikes in the Devil's Garden section on July 5, 6, 8, and August 3 and 6. In all of these surveys one visitor from each group was asked about their group size, the total amount of time they had spent on the roads or trails (depending on the survey), and where and how long they paused during the visit. Finally, with the aid of the interviewer, they were asked to retrace the route of their trip on a map of the Park.

The lengths of road and trail sections between intersections were calculated from Park maps.

For model validation purposes the number of vehicles in the Wolf Ranch (Delicate Arch), The Windows, and Devil's Garden parking lots were counted 11 times a day between 6:00 a.m. and 10:00 p.m. on August 19, 21, 23, and 25 1997. In addition, PAOT counts were conducted at Delicate Arch every minute for several hours each day on twelve days between August 24 and September 26, 1999. The total numbers of vehicles entering the park was recorded with traffic counters on each of the parking lot count and PAOT count days.

Model algorithm and programming

The simulation model was built using the object-oriented dynamic simulation package, Extend (1996). The structure of the model was built with hierarchical *blocks* that represented specific parts of the Park's road and trail systems. The three main types of hierarchical blocks that

comprised the model were entrance/exit blocks, intersection blocks, and road and trail section blocks.

The entrance/exit blocks were built to generate the simulated visitor parties. Visitor parties were generated using an exponential distribution varying around mean values from the entrance counts. The exponential distribution has been demonstrated to accurately simulate arrival rates at park areas with random arrival patterns (Wang and Manning 1999). The parties were then randomly assigned travel modes (automobile or bus) and group size, both according to probability distributions derived from the visitor surveys. Simulated visitor parties were then randomly assigned travel speeds according to a lognormal distribution, which has been demonstrated to accurately simulate different travel speeds in parks (Wang and Manning 1999). The means and standard deviations were calculated from the travel times reported by survey respondents and the lengths of their travel routes. Lastly, the visitor parties were randomly assigned a route identification number according to frequencies of actual routes reported by survey respondents.

The intersection blocks were built to direct simulated visitor parties in the right direction when they arrive at road and trail intersections. Lookup tables unique for each intersection direct each party toward the correct next intersection as indicated by their route identification numbers and how many times, if any, they have been through that intersection.

The road section blocks were built to simulate travel through the road section by delaying simulated visitor parties for the appropriate period of time, according to their assigned travel speeds. The parking lot and attraction blocks also held simulated visitor parties for periods of time. In addition, they were designed to output the numbers of visitors in those areas throughout the simulated day.

Model runs

The model was run with three total use levels: current average total use level, half of the current average, and double the current average. Twelve runs were made for each use level to capture stochastic variation. The average PAOT conditions at Delicate Arch were recorded from these runs.

Number of people at Delicate Arch

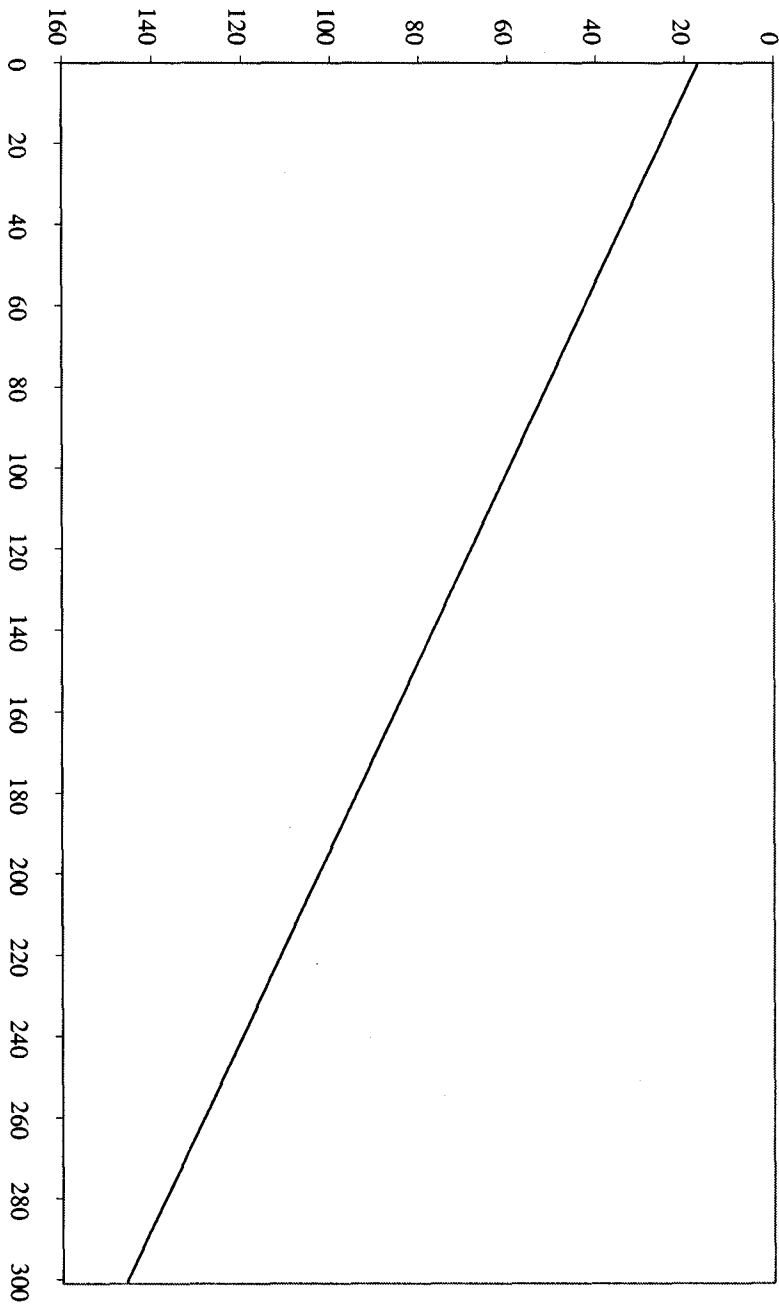


Figure 1. Relationship Between PAOT at Delicate Arch and Park Total Use Levels

Figure 2. PAOT Comparisons at Delicate Arch

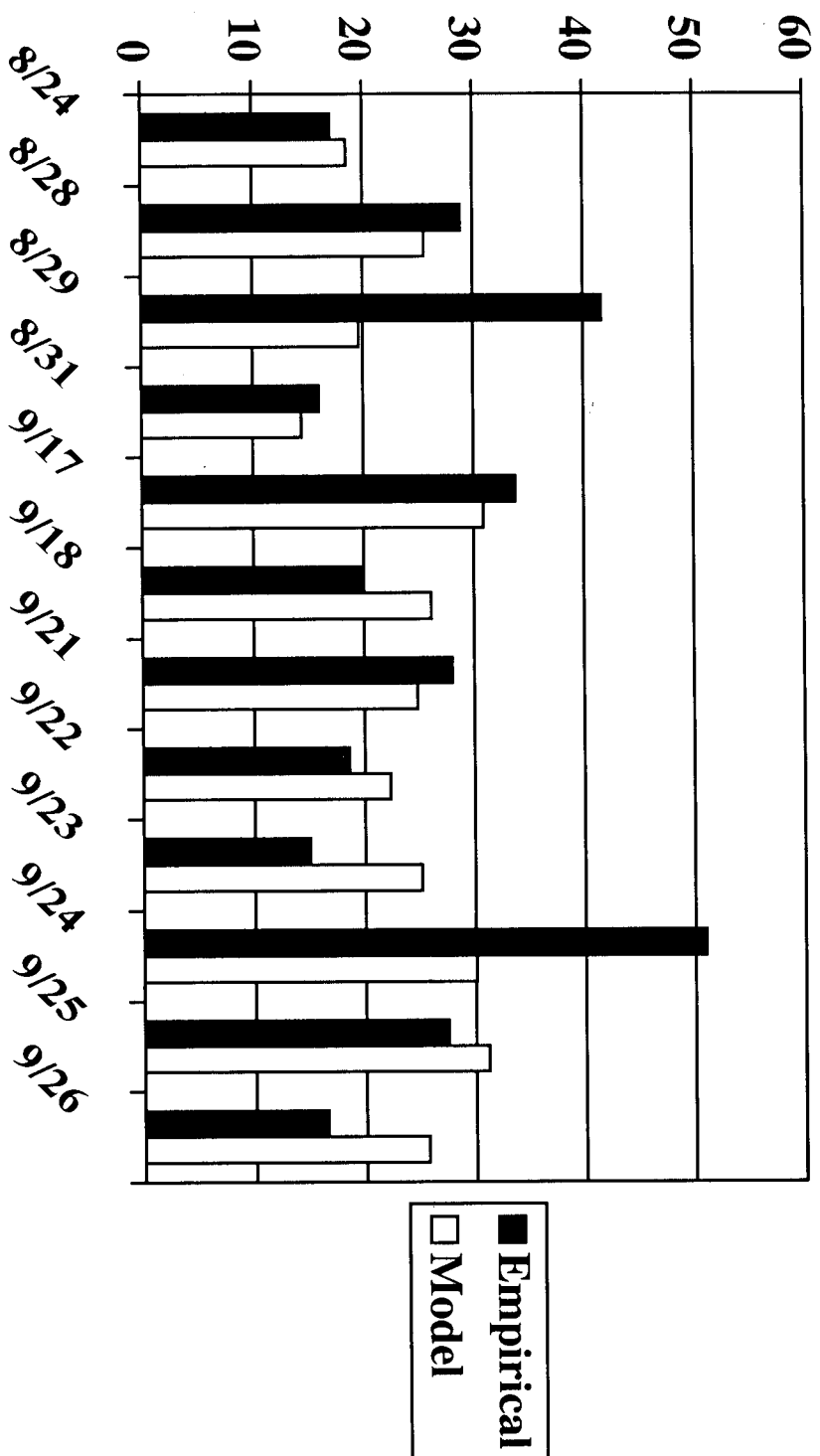
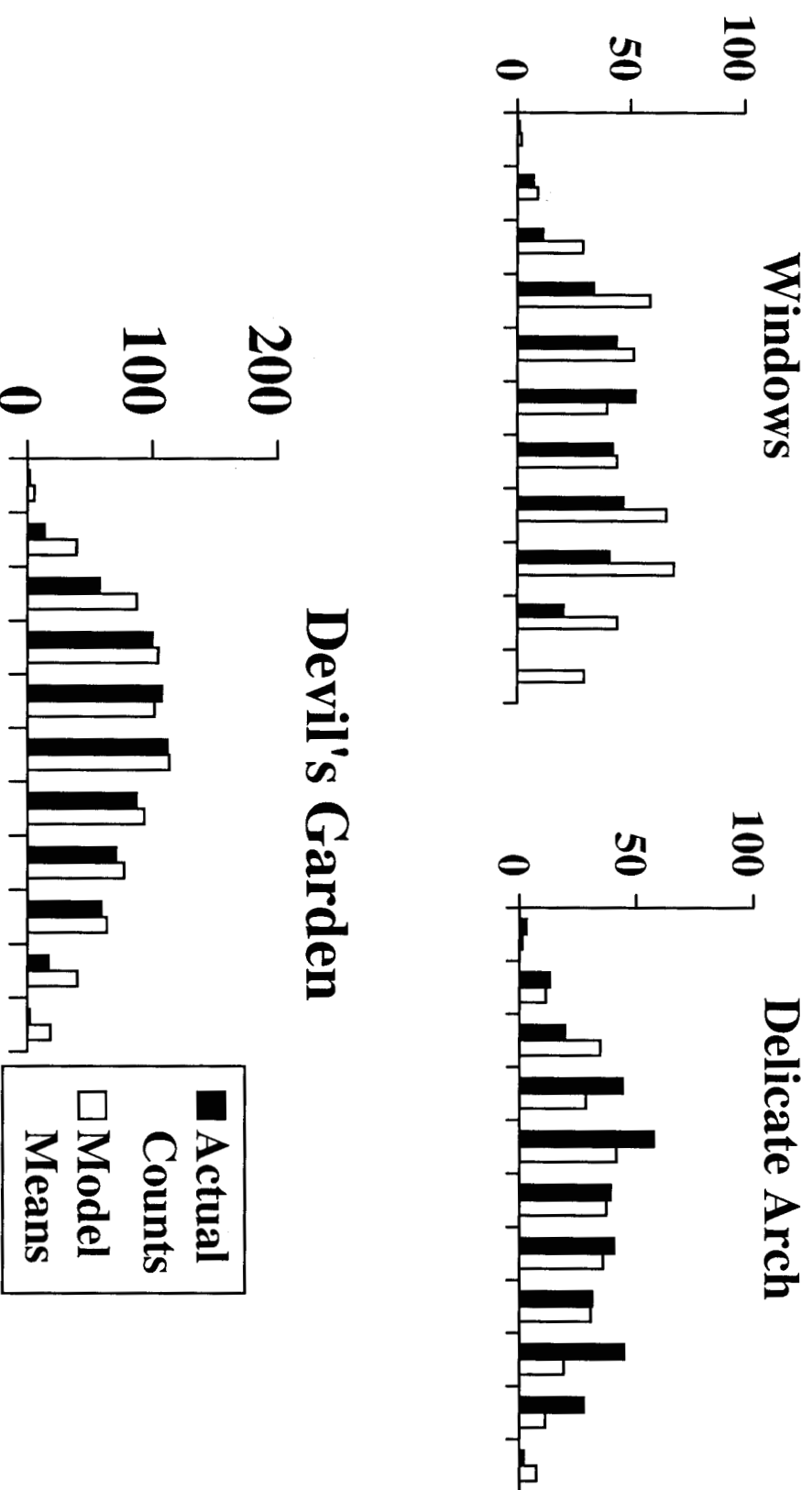


Figure 3. Parking Lot Count Comparisons Through the day on 8/23/98



The model was run a total of 32 times to compare with the empirical parking lot counts for validation purposes. Each run simulated Park use from 5:00 a.m. to 10:00 p.m., but only recorded output from 6:00 a.m. to 10:00 p.m. Output from the first hour was considered unreliable because people who would have entered the Park before 5:00 a.m. were not simulated. The model was run based on the total use levels of the four days on which the parking lot counts were done. The model runs were repeated eight times for each of the four simulated days to capture stochastic variation. The number of vehicles in each parking lot was tracked through each simulated day.

The model was also run for comparison against the PAOT counts at Delicate Arch. The model runs were repeated four times for each of the twelve simulated days to capture stochastic variation. The number of visitors at Delicate Arch was tracked through each simulated day.

Results

Figure 1 shows the relationship between the number of vehicles entering the Park each day and the highest PAOT at Delicate Arch. This relationship allows estimates of the maximum number of vehicles that can be accommodated in the Park without violating selected standards of quality.

Figure 2 shows comparisons between average observed PAOT and model outputs for estimated PAOT for twelve days at Delicate Arch. A visual inspection shows that the results match closely except for August 29 and September 24. Chi-square tests showed significant differences between the distributions.

Figure 3 shows representative output validation results for parking lot counts. Results are shown for comparisons of observed data and model outputs at the three parking lots on August 23. A visual inspection shows that the model matches empirical data closely except for the evening hours at each site. The model underestimates the number of visitors at Delicate Arch and overestimates the number of visitors at the other two sites. Chi-square tests showed significant differences between the distributions.

Conclusions and Implications

Study findings suggest that it is feasible to develop a park wide model of visitor use encompassing both vehicle and pedestrian travel. Moreover, such a model can be used to develop relationships between total park use (e.g., the number of vehicles entering the park each day) and the condition of indicators variables (e.g., PAOT at Delicate Arch). Such a model can be used to estimate the social carrying capacity of a park. While continued monitoring of indicator variables is warranted, modeling can more proactively estimate the point at which standards of quality will be violated, and can reduce needed intensity of monitoring activity.

Discrepancies between model output and field observations designed to validate the model are due primarily to the lack of visitor surveys conducted in the later hours of study

days. As noted above, safety concerns (stopping vehicles after sunset) did not allow surveys to be conducted after dark. In the case of PAOT at Delicate Arch, the August 29 and September 24 field counts were conducted during the evening hours. The parking lot counts also showed the greatest discrepancies in the evenings. This problem will be rectified in the summer of 2000 when additional visitor surveys will be conducted during the evening hours at Delicate Arch, The Windows, and Devils Garden.

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DOES THE SUGGESTION THAT RESPONDENTS RECALL EVENTS CHRONOLOGICALLY SIGNIFICANTLY INFLUENCE THE DATA COLLECTED?

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Abstract: This paper is about estimating a salience scale for trip reporting. The measurement project began as a way of establishing the affects of methodological changes between 1994 and 1997 in the Canadian Travel Survey. This is a survey that Canada uses to study the travel of its residents. There were several changes in methodology that could be expected to influence how trips are recalled. A key change was that in 1994 the interviewers were encouraged to suggest to the respondents that they report chronologically but in 1996 and 1997 they were told not to use the prompt during interviews. It is likely that other changes resulted in response burden being higher in 1996 and 1997 than in 1994. For people reporting two or more trips, chronological reporting should result in trips being reported in random order. It was found that the order in which trips were reported changed with the change in memory cue. The change may have been exacerbated by some trips not being reported because of response burden. The data were analyzed using paired-comparison. The effect of the methodology change is found to be significant. The implications for future research as well as general implications for survey methodology are reported.

Introduction

In 1998, Auctor Consulting Associates (Auctor 1998) examined the processes and products of the 1994, 1996 and 1997 Canadian Travel Surveys. This was done to determine if there were any issues relating to the surveys that should be of concern to the Canadian Tourism Commission, CTC. A key issue was encouraging interviewers to prompt respondents to report trips chronologically. Prompting occurred in 1994 and was discouraged in 1996 and 1997.

Recognizing that prompting influenced recall salience for trips suggested the value of measuring trip-recall-salience. Chronological reporting does not follow salience order for trip reports so confirming that 1994 reporting is not ordered as in 1996 and 1997 would provide proof that responses in 1994 were different from those of the other years.

In order to understand the research done it is necessary to establish common definitions of concepts used in the analysis and to convey some background about the information used. The concept that underlies this research is salience. The critical analysis technique is scale development using paired comparisons. The data sets are the Canadian Travel Survey (CTS) for 1994, 1996 and 1999.

Salience

Salience is a property of an event that indicates how much it sticks out or serves as a focal point (Rotello, 1999; Metha, Starmer, and Sugden, 1994; Shlechter, Herrmann, and Toglia, 1990). In the context of this study trip-recall-salience (TRS) refers to the tendency to recall trips of a certain type more readily than trips of a different type. Therefore, a TRS scale is a scale such that if the value for trip type x is greater than that for trip type y then x tends to be reported ahead of y in reporting trips taken when there are no cues that disrupt recall.

Measuring salience by Paired Comparisons

In conventional paired comparison analysis a set of alternatives, or a subset of a set of alternatives, is presented a pair at a time to a subject who is then asked to specify the correct order for each pair (Tritchler and Lockwood, 1991; David 1988).

Formally, let the set of alternatives be $A=\{x,y,z\}$. For the possible unordered pairs $\{ \{x,y\}, \{x,z\}, \{y,z\} \}$ one wants ordering information from the respondents. When one asks a number of respondents whether x should be "ahead of" y , one gets a number $r(x,y)$, $0 \leq r \leq 1$, for each pair, (x,y) such that this number is an estimate of the probability of x being ranked ahead of y . For this study we did not have respondents compare trips but rather the order in which trips were reported defined the ordered pairs. If a person reports a trip of type x first, then a trip of type y , and last, a trip of type z , then the pairs (x,y) , (x,z) , and (y,z) become the pairs used for analysis. It is important to note that if on average x is 'ahead,' then $S > .5$.

There is an extensive literature on computing scales from paired comparison data (David, 1988). However, a very simple way to define a scale is $S = \text{mean}(r(x,y))$, for all y). This mean value is the average proportion of all alternatives that x is ahead of. It provides a scale on which the salience of every x is defined.

The CTS and Methodology changes between 94', 96 'and 97.'

The Canadian Travel Survey (CTS) is a survey by the Canadian Government in which individuals from randomly

selected households report on their trips (Statistics Canada 1994, 1996, 1997). The data are used to estimate travel volume and expenditures by Canadian residents. The surveys results are an input to planning and in determining some provincial and national policies. They are also used to measure tourism performance.

In this research we are concerned with the 1994, 1996 and 1997 CTS. A key methodology change in collecting data for the CTS was a change in a prompt given to respondents. In 1994, the CTS interviewers were encouraged to prompt respondents to report trips chronologically. In 1996 and 1997 the interviewers were discouraged from using a chronological prompt during interviews for the CTS (Statistics Canada, 1994, 1996, 1997).

The other methodological changes from the 94 to the 96-97 CTS noted by Auctor are:

- 1) Computers were used in 96-97 that in part drove the interview process.
- 2) In 96-97, more elaborate information was asked of the respondents; this increased response burden.
- 3) In 96, the odds of a person being asked to respond to the CTS were twice as great as in 94; this is correlated with a decrease in the number of trips reported.
- 4) In 94, the CTS respondents were not asked to complete other labour force survey components; in 96 there were add-ons and in 97 there were even more add-ons. This could increase the burden felt by the respondents.

A Research Hypothesis, Corollary, and their Justification.

The primary reason to focus on the lack of a prompt in the 96-97 CTS is that the literature states that the mechanism used to prompt recall affects which events are remembered (Huttenlocher, Hedges, and Bradburn, 1990). This indicates that a change in the recall prompt used in the survey will impact the trips that the respondents remember and then report to the interviewer. This leads us to our hypothesis which is that the order in which trips are reported is influenced by the switch from chronological to 'off the top' reporting.

Hypotheses and Corollary

In formal language the null hypotheses is:

H_0 : Prompting respondents to report events chronologically causes no differences in trip reporting from simply asking that trips be reported.

If H_0 is rejected we have:

H_a : Prompting respondents to report events chronologically causes differences from data obtained without prompting.

If H_a is accepted it leads to the following corollary:

Corollary: CTS estimates will be biased because 1994 and 1996-1997 differ in the way respondents were asked to

recall travel.

What the corollary means if accepted will be addressed up in the discussion.

Consider that when respondents are interviewed, a particular type of event may appear to be reported prior to an event of another type. This tendency may depend on the socioeconomic attributes of a respondent and other factors. However, here we are concerned with this being a consequence of trip salience. The propensity to mention one event, ea , ahead of another, eb , can be attributed to a psychological process establishing a salience level designated by $O(e)$. When two trips are to be reported, salience 'disrupted' by other factors defines the reporting order.

If $O(ea) > O(eb)$, then ea tends to be reported ahead of eb .

Because in the CTS one has only some of the data needed to determine $O(e)$, this research is built on the assumption that:

$O(e) = F(A) = F(\text{duration, distance, expenditure, trip type, mode}) + \sim$.

where $\sim$ is considered to be a random variable expressing the factors including special circumstances (e.g., important family event), response disposition (e.g., something mentioned by the interviewer or respondent influencing what is recalled), socioeconomic factors, and recall factors (e.g., different response burden).

Based on variables in the data, 288 distinct types of trips were created ($288 = 4 \times 3 \times 3 \times 4 \times 2$). The variables used were: duration (recoded to 4 levels), distance (recoded to 3 levels), expenditure (recoded to 3 levels), trip type (recoded to 4 levels), and mode of travel (recoded to 2 levels).

Analysis, Results, and Discussion

Steps in Analysis

The first step was to determine the 288 trip types used. The second step in the analysis was to compare the possible pairings. The third step was to separate the trips into the years that they were taken. The fourth step was to compare the years and see if there was a difference in how trips were reported.

The initial SAS program produced estimates of salience. A second program was used to determine the implications of the scale. For every trip type pair (x, y) the program determined if $S(x) > S(y)$. If the response order was (x, y) then the pair was judged a success and if the order was (y, x) the pair was a failure. These scores were used to produce the summary results.

When the SAS program was run it was found that there were 55,000 trips for comparison. Table 1 shows some characteristics of CTS data. First, the number of trip report records are indicated for 94', 96' and 97'. The second line shows the number of

individuals reporting two or more trips. The third line shows the number of 'comparison pairs' generated

from all the trip data for persons reporting two or more trips.

Table 1. Description of 1994, 1996, and 1997 Canadian Travel Surveys.

	Year		
	1994	1996	1997
Trip Report Records	59242	79873	51598
Number of Individuals Reporting Two or More Trips	12723	16226	8480
Number of 'Comparison Pairs.'	28866	37876	15550

Results

We reject H_0 . The data show that at a 95% confidence level, the '94 data differs from the '96 and '97 data, while

the '96 and '97 data are not significantly different.

Table 2.

	Success	Total	Success Ratio	STC	95% LCI	95% UCI
94	18899	28866	0.65471	0.0052	0.64452	0.6649
96	27084	37876	0.71507	0.00469	0.70587	0.7227
97	11223	15550	0.72174	0.00583	0.71031	0.73317

Discussion

Table 2 shows is that when the chronological cue was used in the 94 data more low salience trips were reported ahead of higher salience trips. This supports the idea that 'off-the-top' reporting creates a disposition to report more salient trips first. This confirms that the TRS is effected by the chronological prompt. In contrast the 96' and 97' data collected without the chronological prompt shows no significant difference.

The corollary introduced above is readily interpreted as indicating that accepting H_a implies that CTS estimates will be biased in the sense that there will be a difference between Total trip estimates for 1994 and 1996 that can be attributed to the change in the way that trips are reported. However, proof that reporting differs between 1994 and 1996-97 does not provide proof that this has a consequence on estimated values. It only encourages one to believe that this is likely.

Providing proof that the methodological changes that influenced trip-recall-salience actually result in a bias in estimates of total numbers of trips, total expenditures or other estimates, requires building a link between salience and such estimates.

So what?

If estimates are biased and the influence on accuracy of bias is unknown, the usefulness of the data is limited. For example, in Canada the external indicators of travel increased from 1994 to 1996-97, but the CTS showed a drop in travel. Given the fact that these two sources of information contradicted each other how do we sort out which is giving an accurate picture if we do not know the impact of changes made in the instrument? A salience scale will help to address this issue by helping to show the direction that estimates tend to be off under changing conditions.

Practical Implications

Deriving this understanding of the impacts on recall of prompts is a first step in understanding how trip attributes relate to salience and how respondent attributes influence salience. Though this is not proof that estimates such as total trips will be biased, it gives good reason for concern. This is a step in determining if estimates are biased and if these biases can be corrected.

Future Research

It would seem to be wise to conduct an experiment with a chronological prompt, a neutral prompt, and other factors such as disposition prompts. This would allow an understanding to develop of how prompts work in the travel and recreation recall context.

Conclusions

It is possible to construct a TRS scale using paired comparisons for the '94, '96, and '97 CTS data. Using the TRS scale it is possible to show that suggesting to respondents that they report chronologically has a highly significant effect on the order in which they reported trips. This is indirect evidence that estimates of numbers such as total trips will be biased.

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Marketing & Management in Outdoor Recreation & Tourism

IMPORTANCE-PERFORMANCE ANALYSIS: AN APPLICATION TO MICHIGAN'S NATURAL RESOURCES

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Abstract: In the state of Michigan, the nature-based tourist is becoming an increasingly important target market for providers of natural resources. To meet the demands of this growing market segment, evaluation strategies for nature-based sites are needed to maintain and improve customer satisfaction and loyalty. Evaluation strategies that incorporate consumer input can help to determine whether the needs of the tourists are being met. By using Importance-Performance Analysis, a marketing tool that emphasizes consumer input, the purpose of this study was to determine the satisfaction of the nature-based tourist who has visited Michigan's natural resources. The IP Analysis was used to examine attributes of the experience and to assess whether the state of Michigan is providing adequately for these attributes.

Introduction

Participation in outdoor recreation is one of the largest components of travel in Michigan. Of travelers to Michigan, seventy-two percent say they have participated in some form of outdoor recreation while traveling in Michigan (Holecek, 1995). The enormous amount of public land in the state of Michigan and the growth in tourism make nature-based tourism an increasingly important target market for providers of natural resources. In order to meet the demand of this growing market segment, evaluation strategies for nature-based sites are needed to maintain and improve customer satisfaction and loyalty. By embracing a marketing approach emphasizing consumer input, Michigan tourism officials can determine if the needs of nature-based travelers are being met and determine those areas that are currently considered deficient by those visiting Michigan's natural resources.

Purpose of the Study

The purpose of this study was to determine nature-based tourist satisfaction with the providers of Michigan's natural resources. The Importance-Performance Analysis (IPA) approach was used as the evaluation tool to assist in determining visitor's satisfaction. First developed as a

marketing tool by Martilla & James (1977) to assess consumer satisfaction, the IP analysis in recent years has been used by leisure professionals to assist in the evaluation of customer satisfaction (Guadagnolo, 1985; Hollenhorst, Olson Fortney, 1992; Hudson & Shephard, 1998). The IP analysis works first by determining what attributes or features are important to the consumer. Then information is solicited from the consumers regarding the relative importance of the various attributes and asks how well the agency under study provides for these attributes. The results of the IPA, which are displayed in an easy to interpret two dimensional graph, indicate areas of strength and weakness in the services provided for each attribute presented. The graph is divided into four sections providing an easy guide for management's focus. Decision makers are then able to identify attributes where concentration is needed in order to improve services deemed important by the consumer. The attributes used in IP analysis are generally developed as a result of information gained from previous studies or from focus groups.

The four quadrants on the IP graph are labeled according to the level of importance and performance of each feature or attribute. The quadrant in the upper right section is titled "Keep up the Good Work", indicating the attribute has high importance and high performance. The quadrant in the lower right section is titled "Possible Overkill" indicating the attribute has low importance but showing high performance. The third quadrant in the lower left section titled "Low Priority" indicates that the attribute has low importance and low performance. The fourth quadrant located in the upper left titled "Concentrate Here" includes features or attributes with high importance but rated low in performance. The quadrants "Keep up the Good Work" and "Low Priority" indicate to managers that expectations are being met for these attributes as relative importance is equal to the performance rating. Focus still needs to be given to these attributes to maintain satisfaction levels. The quadrant "Concentrate Here" indicates to managers that the attribute is important to consumers but the agency's performance is not achieving a satisfactory level of the importance. The quadrant "Possible Overkill" rates attributes low in importance while consumers feel the agency is providing high performance on these attributes. Two solutions that might arise from the findings in this quadrant of an IP analysis are that the provider of the resources can redirect attention to the attributes that are performing better than expected or the provider might be able to "position" negative attributes positively in the minds of the traveler or potential traveler.

The Sample

The sampling frame for this study was generated from telephone lists purchased from Survey Sampling, Incorporated of Detroit, Michigan. Data was collected by means of a telephone survey. A random sample of adults aged 18 and older who permanently resided in Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin, and Ontario, Canada were chosen to participate in the study. These geographic areas were chosen because they represent

the target areas which Travel Michigan, the state tourism bureau, identified as areas which tourist to Michigan originate. Adults, age 18 and older, were chosen because they represented those people who make the primary decisions to travel. A total of 350 completed interviews were conducted from May 1997 to August 1997. This number was deemed appropriate for a 95% confidence interval +/- 5%. Interviewing occurred on weekday evenings and weekend evenings and up to three callbacks were made for each contact. This calling procedure has proven to be effective in past studies performed by Travel, Tourism, Recreation, Resources Center at Michigan State University. Of the 350 interviews, a total of 185 people responded "yes" when asked if they "had traveled to Michigan for the purpose of outdoor recreation." These respondents were then asked to complete the importance-performance section of the interview.

Important-Performance Analysis

During questionnaire development, various IP attributes were derived from previous studies conducted about travel to Michigan and from the literature. A total of ten importance statements and ten performance statements were then chosen for the IP section of the interview. These attributes were found to be consistent throughout the previous studies and the literature. The ten attributes under study were scenic appeal, predictable weather, variety of places for water-based activities, variety of trails, scenic waterfalls, undisturbed nature, access to Great Lake coastlines, wildlife viewing, availability of public beaches and clean water. Respondents were asked to indicate the importance of each statement using a 5-point Likert scale, ranging from 1=not at all important to 5=very important and the performance of each statement was measured

similarly using the same scale, however worded "strongly disagree" to "strongly agree".

Mean and median scores were computed for each importance and performance feature (see Table 1). Overall mean and scores were computed for all attributes. According to several researchers (Guadagnolo, 1985; Hollenhorst, Olson and Fortney, 1992), using the overall mean scores as the positioning points for the mid-point of the graph allowed for a more critical appraisal than using the middle point of the scale. As mean and median scores were fairly close and mean scores provided more information, mean scores were used for plotting. The central positions or cross hairs for overall performance and importance were plotted. The axes were 3.53 and 3.71 respectively. The mean of each importance feature was matched with the mean of each performance feature and plotted on the I-P matrix.

Importance-Performance Findings

The findings indicate that clean water and scenic appeal were the two most important natural resource attributes while scenic appeal and variety of places for water-based activities performed the best (see Table 1). In addition, scenic waterfalls and variety of trails were the least important attributes when traveling for the purpose of outdoor recreation. According to travelers, the state did not do a good job of meeting the expectations of nature based travelers regarding the predictability of weather and the availability of scenic waterfalls. The area of high importance relative to low performance was seen in the attributes undisturbed nature and predictable weather. In the IPA graph, this quadrant signifies the features in which managers need to concentrate on higher performance to achieve customer satisfaction (see Figure 1).

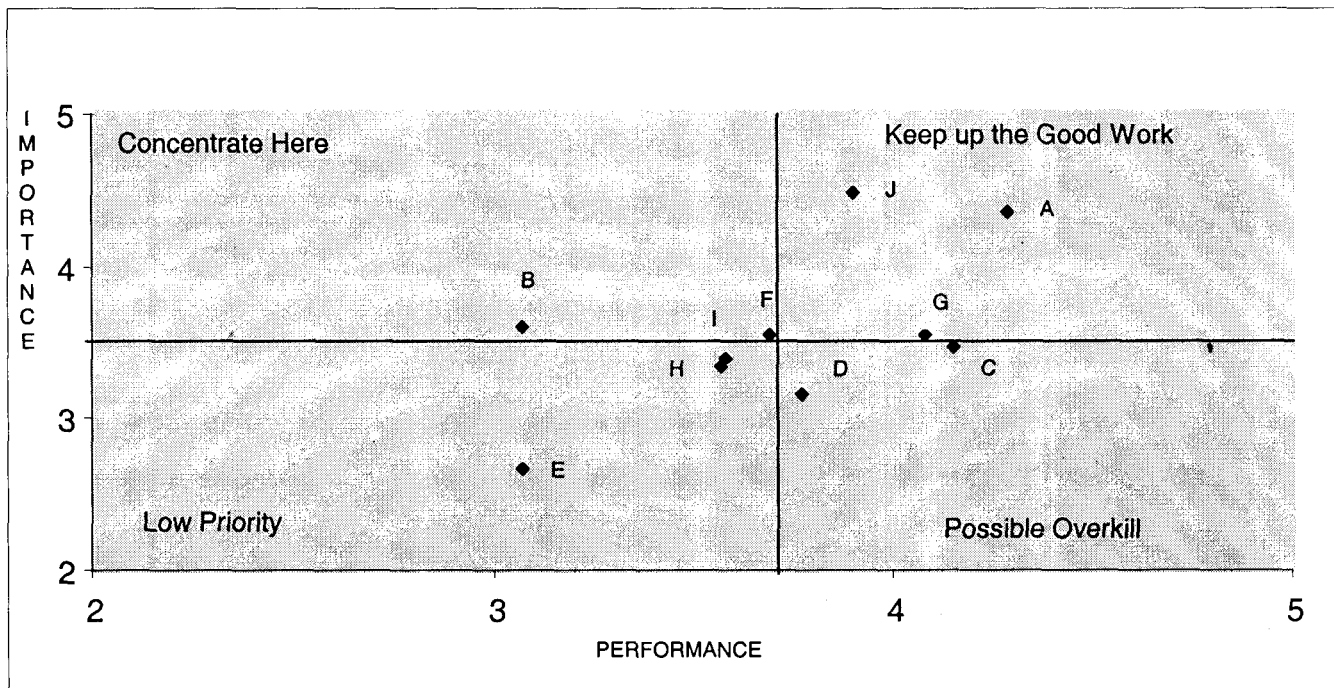
Table 1. Importance and Performance Attributes of Natural Resources

Code	Attributes	Importance ^a			Performance ^b		
		N	Mean	SD	N	Mean	SD
A	Scenic appeal	186	4.26	0.88	185	4.31	0.86
B	Predictable weather	186	3.60	1.34	185	3.07	1.13
C	Variety of places for water-based activities	186	3.48	1.19	182	4.15	0.99
D	Variety of trails	182	3.16	1.22	175	3.77	1.16
E	Scenic waterfalls	182	2.67	1.40	171	3.07	1.37
F	Undisturbed nature	184	3.55	1.29	181	3.69	1.12
G	Access to Great Lake coastlines	183	3.55	1.24	177	4.08	1.15
H	Wildlife viewing	185	3.34	1.27	177	3.57	1.08
I	Availability of public beaches	185	3.39	1.26	178	3.58	1.11
J	Clean water	185	4.32	1.01	183	3.82	0.94
	Overall Means	184	3.53	1.21	179	3.71	1.09

^a Mean values based on a 5 point Likert-type scale, ranging from 1=not at all important and 5=very important.

^b Mean values based on a 5 point Likert-type scale, ranging from 1=strongly disagree and 5=strongly agree.

Figure 1. Importance Performance Matrix of Natural Resource Attributes



Discussion

While undisturbed nature can be assessed and eventually managed, predictable weather cannot. One idea that the State might consider is to look at changing the perception of weather in the minds of the traveler. Advertisements might look to include weather as part of their image. For example, an advertisement could show a group around the campfire enjoying the experience despite a light rain shower. Positioning weather in the minds of the traveler as part of the experience might help to reduce negative perceptions. The attributes receiving low priority (i.e. low importance, low performance) were wildlife viewing, scenic waterfalls and availability of public beaches. While the agency is meeting visitor's expectations on these attributes, these attributes are some of Michigan's finest resources which suggests to managers that this is an area that can be improved by shifting the public's perceptions of the importance of these attributes. By concentrating in these areas, managers can focus on the unique settings that are particular to the Michigan outdoors. In the quadrant that IPA categorized as "possible overkill" were the attributes of variety of trails and a variety of places for water-based activities. The participants rated these areas low in importance, but high in performance. The IPA suggests that more effort is being put in these areas than is needed. Although, this could suggest that variety may be relatively unimportant to these respondents because they have specific ideas of what they wanted to do while visiting Michigan. Variety may possibly be attracting a diverse group of visitors to the area and refocusing efforts may be to the disadvantage of the agency. Prior to making decisions based on the IP matrix, providers should look at the attributes in each of the quadrants and understand their

meaning within the overall study before recommending or making changes.

Limitations and Future Research

One limitation to this study is the relatively small sample size. Further research needs to be conducted to see if this sample is representative of the study population. Another limitation of this study may be the conceptualization of the attributes tested. Future research might use focus groups to better understand the meaning of the attributes. The telephone survey used single item indicators and further questions were prohibitive allowing for multiple interpretations of the attributes. For example, focus groups might provide a more clear explanation of the attribute "undisturbed nature", does this mean lack of pollution or lack of uncharted areas? Focus groups could not only help clarify existing attributes but also assist in developing new attributes. Previous studies utilizing IP analysis used focus groups to create the features or attributes under consideration.

Participants in this study were not asked about their actual visitation patterns and the activities which were pursued. In future studies, visitation patterns and participation in specific activities could be tied into the IP analysis. This might allow for greater depth in the evaluation of the responses. In fact, it may be that traveler's responses vary with primary activity.

This study shows that the Importance-Performance Analysis is definitely one tool which can be used to evaluate customer satisfaction in a nature-based setting. The IPA provides managers with an easily understood marketing analysis of data collected. These results provide

useful information in understanding the nature-based tourist who uses Michigan's natural resources.

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Poster Session

THE EASTERN STATES EXPOSITION: AN EXPLORATION OF BIG E TOURIST EXPENDITURES

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Abstract: The purpose of this paper is to prepare a visitor economic expenditure study for the 1999 Eastern States Exposition, better known as the Big E. The study was executed as part of a class project in Recreation Geography offered the Fall 1999 semester at Westfield State College. The students undertook an economic expenditure study at the Big E by studying tourism economics, executing the visitor exit surveys, and evaluating the responses.

Introduction

The Big E is one of the largest tourism events hosted in the New England region. In 1999, over 1.15 million visitors attended the fair, a slight decline from the past two years. Previous research by Market Street Research, Inc. (1998) found an average per person expenditure of approximately \$113 at the fair, excluding admission and parking. Yet, while totals of visitor expenditures are known, any disaggregated, i.e., lodging, transportation, food, drink, vendors, amusement, etc. expenses are unknown.

Recreation and tourism economic impacts have been widely debated over the past 75 years. In fact, Recreation Geography evolved from the field of Economic Geography. The early research of Freeman (1929), McMurry (1930) and Brown (1935) first postulated the relative importance of leisure and attempted to quantify the importance in economic terms.

Yet today, there remains considerable debate on the economic analysis of tourism events, especially in the use of economic multipliers, cost-benefit analysis, and regional impact of tourism (Hall and Page 1999). The economic impacts of tourism can be defined in terms of primary and secondary impacts. Primary impacts are the direct expenditures of tourists for food, travel and lodging. Secondary economic impacts may be indirect or induced. Indirect impacts include expenditures incurred by businesses supporting tourist visits, e.g., a hotel buys cleaning supplies. Induced tourist impacts occur when the employee of the hotel can buy a new stereo from the salary.

Given the estimated 1998 tourist expenditures of \$113 per person (excluding outliers) and the attendance of 1.25 million in 1998, one could expect as much as \$141.25 million in expenditures! This paper seeks to further define per capita expenditures from an expenditure survey administered at fair exits. A limitation in this study must be stated at this point; that is, for the true economic impact to

occur, only new money entering the economy from visitors outside the community can count. It is quite difficult to define the community, especially near political boundaries. Therefore, tourist expenditures from visitors residing sixty miles or more from West Springfield will be summarized as well.

Implementation Plan

Stage One, or the survey creation stage, occurred during the summer months by consulting with the Eastern States Exposition staff. The marketing staff had some tourism expenditure data at the aggregate (or total) level, and yet lacked any knowledge of precisely what type of expenditures occur during the event. Therefore, the lead author designed a survey instrument to collect the socio-economic and demographic data needed. The instrument was pretested on 18 September 1999 and was found to be appropriate for the study. Minor adjustments in the instructions for the survey teams were made at this time. A copy of the survey instrument is found in Appendix A.

Stage Two took place during the first two weeks of the 1999-2000 academic year. In this stage, students enrolled in GARP0218 Recreation Geography were introduced to the economics of tourism and were organized to execute the survey. Thirteen of the twenty-five students were Business Management majors, seven were Regional Planning majors, and the remaining were studying a variety of disciplines. The students were trained in basic surveying techniques with readings from a world recognized tourism planning and management manual (TRRU, 1983). The students practiced administering the survey until they attended the fair.

During the event, students were posted at several exits of The Big E to solicit responses to a tourism economic impact survey. The survey teams were provided with a Big E cap, a nametag, and a letter of authorization. At all times a site supervisor was present to deal with questions and problems. A total of 406 visitors were surveyed during the fair with an overall response rate of 39%. Details of times and survey numbers were summarized and checked by the site supervisor.

Stage Three involved the tabulation and interpretation of the data. The survey teams assisted in the data entry, additional research in tourism economics, and prepared maps and graphics for subsequent presentation. Specifically, the data were entered in a Microsoft Access™ Database and later exported to an Excel™ Spreadsheet that served as the data file for statistical analysis in SPSS for Windows™. This process of multiple software insures very accurate data encoding and analyses.

Results

In this section of the paper, details describing the data collection process and a summary of key findings are discussed. In addition, some interpretation and explanation will be provided. While the data were checked in the field, during encoding, and in the analysis stage, some "missing"

values, or otherwise incomplete responses remained in the sample. The interpretation is the responsibility of the lead author and not the other members of the survey team.

Sampling

Seven survey dates were assigned during the Big E event. The first date, Saturday 18 September 1999, permitted the pretesting of the survey instrument and as a result, additional instructions were provided to the survey teams. The six remaining survey dates were Friday the 24th, Saturday the 25th, Sunday the 26th, Tuesday the 28th, Saturday the 2nd of October and the last day on Sunday the 3rd. The survey team had one rain date (Tuesday 21 September) which forced a move to the following Tuesday the 28th. This schedule was not randomly selected, since obviously only two weekdays were sampled. At best, the sampling schedule would be called a convenience sample, since the dates and times were selected to accommodate the survey teams and to maximize success in data collection during times when the greatest number of visitors were

expected to be leaving the grounds. However, the over-sampling on the weekends, when the attendance at the fair is the greatest, allowed the survey teams to get a very high response rate.

Survey teams of three to five students were positioned at various exit gates in the late afternoon and early evening to collect the data. The late afternoon was appropriate to insure a higher number of exit interviews. This meant however, that morning and late evening visitors were not sampled.

The survey teams had to approach 1036 parties to obtain 406 surveys, yielding a 39% response rate. Gate 1B, where visitors awaited their return home by bus, provided an excellent opportunity to collect data and thus had the highest number of surveys (37.2%). Two other gates (5 and 9A) provided over 20% of our sample each. The other gates had higher rates of refusals and therefore had a lower number of completed surveys. A summary of survey dates and the resulting surveys obtained are shown in Table 1.

Table 1. GATE by DATE Crosstabulation
Survey Counts (percentage)

		DATE / daily attendance							Total
		18-SEP-99 102,046	24-SEP-99 75,956	25-SEP-99 130,524	26-SEP-99 107,929	28-SEP-99 50,929	02-OCT-99 135,506	03-OCT-99 84,774	
G A T E	1 B	5	27	20	45	13	19	22	151 (37.2%)
	4		15		3		16		34 (8.4%)
	5		38	28	9		10	3	88 (21.7%)
	7		3		12	18			33 (8.1%)
	9 A			19	11	36	16	18	100 (24.6%)
Sum		5 (1.2%)	83 (20.4%)	67 (16.5%)	80 (19.7%)	67 (16.5%)	61 (15%)	43 (10.6%)	406

Visitor Characteristics

The first question in the survey identified the number of people in the party. Most attendees to the Big E are couples or pairs, followed closely by groups of three or

four. Table 2 summarizes the distribution of party size. While some parties were larger, about 88% of the sample had four or less people in them.

Table 2. Part Size

		Frequency	Percent	Cumulative Percent
Size Of Party	1.00	14	3.4	3.4
	2.00	197	48.5	52.0
	3.00	81	20.0	71.9
	4.00	66	16.3	88.2
	5.00	23	5.7	93.8
	6.00	13	3.2	97.0
	7.00	4	1.0	98.0
	8.00	2	.5	98.5
	9.00	2	.5	99.0
	12.00	2	.5	99.5
	15.00	1	.2	99.8
	47.00	1	.2	100.0
	Total	406	100.0	

After determining the party size, the surveyor asked about the attendee's home residence. This information included hometown and zip code for analysis about the market served by the Big E. Our sample came from all of the

northeastern states and one group from North Carolina. As shown in Table 3, Massachusetts' attendance was the highest with well over 200 groups (53.7%).

Table 3. Big E Visitors by Home State.

		Frequency	Percent	Cumulative Percent
State	CT	122	30.0	30.6
	MA	218	53.7	85.2
	ME	4	1.0	86.2
	NC	1	.2	86.5
	NH	6	1.5	88.0
	NJ	3	.7	88.7
	NY	21	5.2	94.0
	RI	15	3.7	97.7
	VT	9	2.2	100.0
	Total	399	98.3	
Missing	99	7	1.7	
Total		406	100.0	

The map found in Figure 1 illustrates the spatial distribution of attendees by home zip code and shows a wide coverage for the event. Since 85.2% of our sample live in Massachusetts or Connecticut, only those home communities are shown. One hundred and twenty eight (31.5%) of the respondents indicated they lived within twenty miles of The Big E, one hundred parties (24.6%)

lived between twenty-one and sixty miles and the majority, 168 (41.4%) lived sixty-one miles or more away. Since we had the home zip code, travel distance was calculated to West Springfield using the web site Mapblast (<http://www.mapblast.com>). Average travel distance to the Big E was fifty-seven miles.

The Big E Visitors 1999

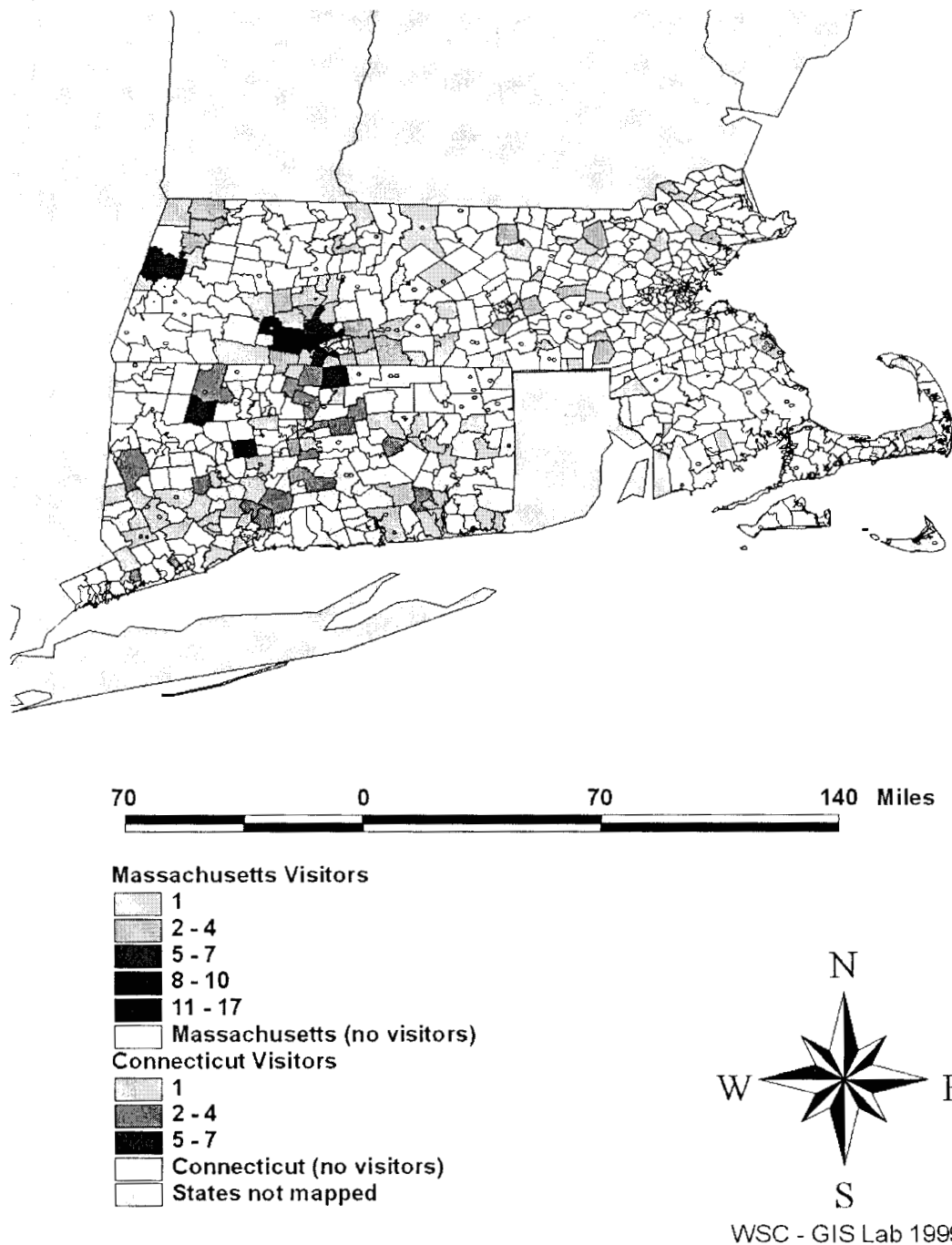


Figure 1. Map of Big E visitors from Massachusetts or Connecticut home zip codes.

Day Trip vs. Overnight

The majority of the visitors attended the Big E as part of a day trip (n=388, 95.6%). However, ten groups did stay in a local hotel, with an average per night room cost of \$102.70. Five parties stayed for one night, one party stayed for two nights, and four parties stayed in the area for three nights.

Eight parties stayed overnight in the local area with family or friends. Table 4 summarizes this trip behavior. Twelve of the parties who were staying overnight in the area exited the Big E at Gate 1B for a ride on the bus, while the other groups left from one of the other gates to presumably drive a car.

Table 4. Day Trip vs. Hotel vs. Staying with Family/Friends

		Frequency	Percent	Cumulative Percent
DAYTRIP?	DAY	388	95.6	95.6
	HOTEL	10	2.5	98.0
	OTHER	8	2.0	100.0
Total		406	100.0	

Big E Parking

Parking is always an issue for Big E visitors. Visitors typically have the choice to park and ride on the PVTA busses (n=107, 26.4%), drive their own car and park in the Big E's public lot (n=102, 25.1%), or park in a private lot along or near Memorial Avenue (n=183, 45.1%). While the public lot had a fee of \$5, the private parking opportunities varied temporally and spatially. The average cost of parking was \$4.15. Since many of the visitors to the Big E take the bus and may have had the parking fee included in the bus and entrance ticket, the average parking fee is lowered artificially. For the 180 parties (44.3%) paying to park in private lots, the average cost was \$6.12.

Visitor Expenditures

The next four questions sought to get better estimates on group expenditures. An average group spent \$34.09 on food, snacks and non-alcoholic beverages, and another \$5.84 on beer or wine. On average, amusement rides cost the groups \$4.85, and craft purchases amounted to an average of \$31.22. Please note that 72.4 % of the sample did not spend any money on amusement rides; thus the Midway expenses are quite low. The distribution of purchases with maximums and minimums are summarized in Table 5. Be reminded that these represent group purchases.

Table 5. Descriptive Statistics of Group Purchases

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
FOOD	404	\$.00 (3.0%)	\$300.00	\$13,771.00	\$34.0866	\$36.3064
ALCOHOL	402	\$.00 (67.7%)	\$140.00	\$2,349.00	\$5.8433	\$14.1801
AMUSEMENTS	404	\$.00 (72.4%)	\$90.00	\$1,961.00	\$4.8540	\$10.3019
CRAFTS	405	\$.00 (52.0%)	\$500.00	\$12,643.00	\$31.2173	\$68.8920

The survey teams asked the groups about additional purchases. Most common purchases included items for the home and garden, clothing, and food. The more expensive purchases included one gazebo, one piano, one dining room table and two hot tubs. For these extra purchases, one finds a range of \$0.00 to \$7,000.00, with an average of \$83.14 per group.

Total group expenditures, including hotel (if appropriate), parking, and purchases, averaged \$169.43 while the per capita expenses were \$69.02. Since the greatest attendance comes from the local states of Massachusetts and

Connecticut, most money spent at the Big E is from those two states. To see what kinds of expenditures occur from residents of different states, see the crosstabulation found in Table 6. The disproportionate number of larger spenders from states other than Massachusetts and Connecticut seems to suggest that parties traveling greater distances are willing to spend more at the fair. Other interesting facts observed looking at the detailed Table 6 is that the sole \$00.00 spender came from Massachusetts. Over 60% of the attendees spent less than \$100 per group, with Massachusetts leading the pack.

Table 6. State by Group Expenditures Crosstabulation

			Group Expenditures				Total
			0	1 to 99 dollars	100 to 499 dollars	500 dollars and above	
STATE	CT	Count		71	40	11	122
		% within STATE		58.2%	32.8%	9.0%	100.0%
		% within Group		29.1%	33.6%	31.4%	30.6%
		% of Total		17.8%	10.0%	2.8%	30.6%
	MA	Count	1	138	62	17	218
		% within STATE	.5%	63.3%	28.4%	7.8%	100.0%
		% within Group	100.0%	56.6%	52.1%	48.6%	54.6%
		% of Total	.3%	34.6%	15.5%	4.3%	54.6%
	ME	Count		3	1		4
		% within STATE		75.0%	25.0%		100.0%
		% within Group		1.2%	.8%		1.0%
		% of Total		.8%	.3%		1.0%
	NC	Count			1		1
		% within STATE			100.0%		100.0%
		% within Group			.8%		.3%
		% of Total			.3%		.3%
	NH	Count		5		1	6
		% within STATE		83.3%		16.7%	100.0%
		% within Group		2.0%		2.9%	1.5%
		% of Total		1.3%		.3%	1.5%
	NJ	Count		2	1		3
		% within STATE		66.7%	33.3%		100.0%
		% within Group		.8%	.8%		.8%
		% of Total		.5%	.3%		.8%
	NY	Count		8	10	3	21
		% within STATE		38.1%	47.6%	14.3%	100.0%
		% within Group		3.3%	8.4%	8.6%	5.3%
		% of Total		2.0%	2.5%	.8%	5.3%
	RI	Count		12	3		15
		% within STATE		80.0%	20.0%		100.0%
		% within Group		4.9%	2.5%		3.8%
		% of Total		3.0%	.8%		3.8%
	VT	Count		5	1	3	9
		% within STATE		55.6%	11.1%	33.3%	100.0%
		% within Group		2.0%	.8%	8.6%	2.3%
		% of Total		1.3%	.3%	.8%	2.3%
Total	Count		1	244	119	35	399
	% within STATE		.3%	61.2%	29.8%	8.8%	100.0%
	% within Group Expenditures		100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total		.3%	61.2%	29.8%	8.8%	100.0%

Likewise, as Table 7 illustrates, the majority of local residents (within twenty miles) spent less than \$100. While one might surmise a larger proportion of major expenditures from the table for those visitors who travel the greater distance, this is not a significant relationship. Note: a gamma statistic of 0.090, significant at 0.249 level

suggests that there is a poor relationship between travel distance (HOWFAR) and expenditures (Group Totals).

The next question sought to identify purchases with local Memorial Avenue merchants, and the survey indicates on average a \$1.46 expenditure (excluding parking). One

party indicated they were planning to eat dinner along

Memorial Avenue and estimated a \$50 meal.

Table 7. HOWFAR * Group Totals Crosstabulation

			Group Totals				Total
			\$0	1 to 99 dollars	100 to 499 dollars	500 dollars and above	
HOW FAR	0 to 20 Miles	Count	1	84	32	11	128
		% within HOWFAR	.8%	65.6%	25.0%	8.6%	100.0%
		% within Group Totals	100.0%	34.9%	27.1%	30.6%	32.3%
		% of Total	.3%	21.2%	8.1%	2.8%	32.3%
	21 to 60 Miles	Count		57	35	8	100
		% within HOWFAR		57.0%	35.0%	8.0%	100.0%
		% within Group Totals		23.7%	29.7%	22.2%	25.3%
		% of Total		14.4%	8.8%	2.0%	25.3%
	61 miles or more	Count		100	51	17	168
		% within HOWFAR		59.5%	30.4%	10.1%	100.0%
		% within Group Totals		41.5%	43.2%	47.2%	42.4%
		% of Total		25.3%	12.9%	4.3%	42.4%
Total			Count	1	241	118	396
			% within HOWFAR	.3%	60.9%	29.8%	100.0%
			% within Group Totals	100.0%	100.0%	100.0%	100.0%
			% of Total	.3%	60.9%	29.8%	100.0%

Projected Expenditures

The next step in the analysis involves the projection of expenditures found in our survey to the total visitor population and to estimate the regional economic impact of the Big E. As indicated above, the average per person total expenditure was \$69.02. Given the 1999 total attendance of 1,146,079 one could estimate a total expenditure of \$79,102,372.58.

Reviewing the results found in Table 8 we see an average group expenditure of \$34.08 for food, \$5.84 for alcohol, \$4.85 for amusements and \$31.21 for crafts. If we investigate per-person expenses, we get \$11.69 for food, \$1.84 for beer or wine, \$1.52 for midway rides, and \$11.59 for crafts. Projecting these per-person expenses against the total 1999 attendance yields \$13,406,373.71 for food and non-alcoholic beverages, \$2,113,484.28 for beer or wine, \$1,750,521.06 for amusement rides and \$13,284,660.12 for crafts.

Table 8. Descriptive Statistics of Group and Individual Purchases

	Mean Group Expenditures	Mean Per- Person Expenditures	Minimum	Maximum
FOOD	\$34.0866	\$11.6976	\$0.00	\$150.00
ALCOHOL	\$5.8433	\$1.8441	\$0.00	\$50.00
AMUSEMENTS	\$4.8540	\$1.5274	\$0.00	\$22.50
CRAFTS	\$31.2173	\$11.5914	\$0.00	\$250.00

The final step in assessing the economic impact is to eliminate local residents from the sample. Since local residents are expected to spend money in the local region anyway, they really do not add to the economy like non-

residents do (Crompton 1999). For this argument, Big E staff requested information on travel distance to the Big E. Therefore only those visitors living 60 miles or more will be counted in this step.

Table 7 shows that 168 (42.2%) of the parties surveyed live 60 miles or more from the Big E. Nearly 60% of those groups spent less than \$100, about 30% spent between \$100 and \$499 and just over 10% spent greater than \$500. For these outside contributors to the local economy we find an average group expenditure of \$166.99 and a per-person expenditure of \$65.23. These figures are slightly less than all attendees to the Big E. Since 42.4% of our sample reside outside the 60 mile area, our new projected economic impact would be 42.4% live outside of 60 miles * 1,146,079 total attendance = 485,937 attendees * \$65.23 per-person expenditures yields \$31,697,670.51 total regional economic impact by visitors!

Miscellaneous Questions

Concluding questions sought information about visitor expectations by asking, "Is there something you expected to find at the Big E, but didn't?" A majority of the parties replied no (n=336), however those who did, commented on the lack of certain ethnic foods and drinks (e.g., German beer garden), other foods like roasted peanuts, chocolate, "blooming onion", and the circus (note: obviously this party did not exit gate 7!) The most common answer was that groups did not see the unexpected, that is, they knew what to expect but had hoped to see something new!

Asked if they had attended another State Fair, most indicated they had attended fairs, but not the larger State Fairs. Most common fairs attended prior to the Big E included the New York State Fair and miscellaneous State Fairs across the country. Many visitors had visited local or county fairs, with the Tri-County Fair and Topsfield being the most popular. Dates of attendance were widely distributed and indicate that parties tend to visit only one fair a year.

A final thank you ended the survey and the surveyor recorded the date, time, gate, and current weather conditions.

Discussion

First of all, it must be stated that given the academic schedules of the student surveyors, data collection occurred primarily on weekends and shortly before dusk. Thus, no data is available for parties attending the fair on most of the weekdays and leaving the grounds in the morning or late night. One could suggest, however, that most day trip visitors would spend the "day" at the fair and leave at supertime anyway.

Gate 7 had the fewest surveys with thirty-three. A very high refusal rate occurred here and might be explained by the parties leaving the circus arena (often with screaming children!). Yet despite this, the overall response rate of 39% is quite good. Most parties, seeing that the survey (Appendix A) was only one page, cooperated. Since the survey team identified themselves as Westfield State College students, many of the groups immediately related to the college students and were willing to answer the questions.

We found expenditures to be quite lower than previous market research. There are several possible reasons for this. First, consider the over-sampling at Gate 1B where most of the visitors awaited a bus to return home or to the hotel. Not wishing to carry bulky items on the bus may reduce the expenditures of many of the groups. Since the survey did not collect demographic characteristics of the bus riders, these details (age, income, family size etc.) could be incorporated in future studies.

However, since the surveys asked for expenditures in broken down categories (e.g., hotel, parking, food, drink, craft, miscellaneous etc.), one could better calculate total expenditures rather than asking for a single total expense. Therefore the data collected should be fairly representative of group (and per capita) expenses at the fair.

Determining travel distance was a problem for some of the surveys, but easily corrected and checked in the post processing stage. For example, for incomplete responses to travel zones (many could not determine if they lived nineteen or twenty-one miles away) the data encoding calculated average travel distance from zip code to zip code. Given that someone estimated travel to Adams was less than sixty miles meant an underestimation of travel distance. Often people know the time of travel but will under or overestimate travel distance.

The experience overall was very positive and an eye-opening one for the students. Most of the students had only attended a fair as a visitor. This experience permitted them to experience the fair through the eyes of other attendees. And while many of the survey teams experienced a high level of survey rejection from the fair visitors, this behind the scene opportunity was educational.

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<http://www.ifea.com/>
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<http://www.for.nau.edu/geography/rt/>
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<http://www.census.gov/prod/3/98pubs/98statab/cc98statab.htm>

Appendix A

Hi, I am a student from Westfield State College and am conducting a survey for the Big E on tourist expenditures. Would you mind if I ask you a few questions? (Seek one adult from group.)

1. How many in your party? _____
2. What is your hometown and zip code? _____
 How far is that? ____ <= 20 miles, ____ 21 to 60 miles, ____ 60+ miles
3. Is your visit to the Big E a day trip, or are you staying overnight?
 Drive ____ Staying local with family/friend? ____
 Hotel? ____, If so, which one and how much per night? _____ \$ ____
 How many nights? _____
4. Where did you park? _____. How much? \$ _____

Now I want to ask about your Big E purchases. How much did your party....

5. Spend on food/snacks and non-alcoholic drinks? \$ _____
6. Spend on beer or wine? \$ _____
7. Spend on amusement rides? \$ _____
8. Spend on crafts? \$ _____
9. Any other purchases, list and price?
 _____ \$ _____ \$ _____
 _____ \$ _____ \$ _____
 _____ \$ _____ \$ _____
10. How much have you spent with local merchants along Memorial Ave.
 (gas, restaurants etc.)? _____

Only a couple more questions...

11. Is there something you expected to find at the Big E, but didn't?

 12. Have you ever been to another State Fair before? Yes / No
 If yes, where and when? _____

 If yes, how would you compare The Big E to these other fairs?
 Better _____ Same _____ Worse _____
- That's it! Any questions/comments for me? Thanks for the help on the survey!

Gate # _____ Date _____
 Time _____ Weather _____ Interviewer _____

SUSTAINABLE TOURISM DEVELOPMENT: THE CASE STUDY OF ANTALYA, TURKEY

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Abstract: This paper discusses ideas about how tourism can be made base for sustainable tourism development in Antalya, Turkey. The introduction is a general overview of sustainable tourism development in coastal areas. The paper also addresses the role of NGOs in the course of development. Information is given about coastal tourism facilities in Turkey. Finally, sustainable tourism development in the case study area, Antalya, is discussed extensively as a characteristic region in Turkey.

Introduction

Sustainable tourism is tourism that combines high standards of quality with environmental constraints, tourists and local residents in a friendly and stimulating manner which would prove to be a better way to conduct tourism all over the world. In other words, it is self-maintaining tourism solving problems without a harm to its surroundings.

Compared to the other areas surrounding the City of Antalya, this is a remarkable example exhibiting both the prosperity and problems of rapid development from the local tourism industry. To make the development more sustainable, some efforts can be made by local businesses that contribute to tourism including NGOs, government and residents who both directly and indirectly have become a part of the tourism industry. As an example, local businesses should strictly obey the plans and guidelines set up by government agencies and NGOs. Moreover, they should collaborate with them when necessary. Though NGOs are newly established, they have proven to be quite useful and effective in planning and protection of sensitive land resources.

Last, but not least, the case of Antalya can be a pilot region in Turkey in which perspectives of sustainable tourism development can be applied. Results of special techniques, planning and implementation that are used in the case of Antalya can then be used to reshape the tourism industry in various other coastal touristic regions.

The following discussion is organized as follows. First, we discuss sustainable and tourism development in general. A

combination of these, namely sustainable tourism development in coastal areas, is our next topic. The role of NGOs, general structure of tourism sectors in Turkey with its tourism policies for coastal region follows. Finally, the case area, Antalya, with its sustainable development problems and proposed approaches for their solutions are considered. Some concluding remarks are made.

Sustainable Development:

The World Commission on Environment and Development (WCED) introduced the concept of sustainable development in the Brundtland Report in 1987, defining sustainable development as "development that meets the needs of the present without compromising the ability of the future generations to meet their own needs." In addition, the Second World Conservation Strategy (1990) used the term sustainable development with the following meaning "to improve the quality of life of human beings by living within the carrying capacity of the ecosystems that supports life."

The concept of sustainable development also includes the strategy to establish a balance between individual motives and intragenerational motives of the society. Though this is not always possible, most the time there are strong cultural and historical complications that make such programs difficult to apply. Therefore, defining a concept that supports the strategy of sustainable development, must take into account various aspects of the region, whose benefits may not always coincide, and may in some cases directly conflict with nature (Ozaydin and Ozaydin 1998).

Tourism and Tourism Development

Tourism is a practice of travel for pleasure. Sometimes it is hard to define but easy to recognize. From the point of view of Troost (1998) "tourism is a necessary activity as a result of the negative impacts of modern life such as traffic congestion, sound pollution, over-crowding, and working hours." Tourism, which causes both undesired development and regeneration, helps people to be aware of the real value of assets existing in their region.

Tourist activity should form part of a broader framework of sustainable development in the world. Tourism is not an end in itself but should be as means to ensure more harmonious development of the societies.

The tourism industry is based on cultural and natural resources that are not produced by tourism itself, but countries are making both short and long term investments to attract tourism and to supply it with such means as accommodations, catering facilities, entertainment, etc.

Tourism development and its impact on the landscape and the environment should be taken together. Troost (1998) advocates the opinion that "tourism development should take into account the pre-existing situation of the natural, built and social environment." Tourism development activities can be directly responsible for serious actions against the environment. A couple of them are extremely serious. First of all, construction of excessive touristic facilities on coastal areas has significant impact on the natural landscape and resources of the region. Pollution

caused by bathers and by debris dumping on uncontrolled beaches is another problem faced in such coastal regions. Moreover, natural (rock, cliff, wetland, etc.) landscape features suffer from the interventions being encourage and develop the tourism industry.

Tourism is indirectly responsible for unwise use of water resources and intensification of the remaining crops using chemicals. Incompatibility of specifications and health provisions for the disposal of hotel sewage is yet another issue encountered in coastal regions. In these respects, the author strongly agrees to the opinion of Troost (1998) who claimed that "the beauty of the natural environment of the coastal cities, combined with cultural heritage, their age-long cultural history, the tradition, the mild climate are transforming quiet and low economic development areas into tourist areas in brisk demand. Tourism gradually becomes mass tourism and its impacts on coastal areas are serious, threatening the particular character of the place."

All these conditions lead to the necessity of tourist accommodation facilities to be built at rates corresponding to the demand that can lead to massive construction activities.

Sustainable Tourism

Sustainable tourism has several definitions. According to the definition of the Federation of Nature and National Parks (FNNP 1993), sustainable tourism is "all forms of tourism development, management, and activity that maintain the environmental, social and economic integrity and well being of natural, built and cultural resources in perpetuity." A publication by the Tourism Concern and the World Wide Fund for Nature defines sustainable tourism as a tourism which "operates within natural capacities for the regeneration and future productivity of natural resources; recognizes the contribution that people and communities, customs and lifestyles, make to the tourism experience; accepts that these people must have an equitable share in economic benefits of tourism; and is guided by the wishes of local people and communities in the host areas" (T.C. and WWF 1992).

Sustainable tourism means tourism that combines tourist development with respect for and preservation between the tourism industry, the visitors, the host communities and the environment. Recently, Troost (1998) brought forward a new definition to sustainable tourism, according to him "sustainable tourism is tourism that ensures the preservation of quality in harmony with the environment, the tourists themselves, the local population and all other factors involved in tourism."

Sustainable tourism can be subdivided into four attributes (Figure-1) according to its economic, environmental, geographical, and sociological aspects (MED Forum):

- Long-lasting: Sustainable tourism should have properly planned long-term economical aims.
- Environment Friendly: Sustainable tourism should respect the carrying capacity of the natural and

cultural spaces, being aware of seasonal effects and searching for ways to minimize them.

- Diversified: Sustainable tourism should be designed, in relation to the hinterland, by establishing a delicate equilibrium between the local enterprises and personality of the site, that would work in favor of the preservation of natural beauty when a deviation from equilibrium is perceived.
- Participatory: Sustainable tourism requires the participation of the local residents, which benefit from tourism as well.

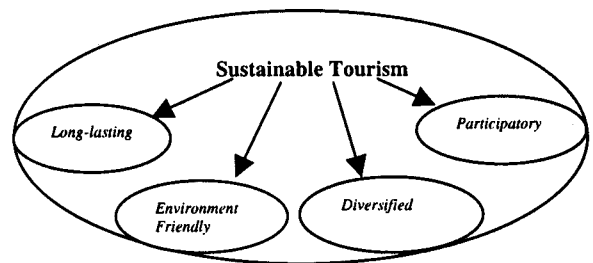


Figure-1: Sustainable Tourism

Sustainable tourism development has to be economically viable and naturally and culturally sensitive at the same time. As inappropriate tourism development results in increasing stress on destinations and consequently in negative changes in the destinations' physical, economic, and socio-cultural characteristics.

Sustainable Tourism Development in Coastal Areas

Historically, settlements have been generally located in coastal areas for ease of trade and defense. This is, because coastal areas constitute a very valuable and limited asset for economic development due to their natural resources and are mostly irreplaceable once misappropriated (Eke 1996; Eke et al. 1997).

It requires special techniques and innovative ways of planning and implementation to develop sustainable tourism in coastal regions that are popular places for touristic activities. Sustainability can be incorporated into tourism planning in coastal areas if programs and tools are designed or devised.

According to Eke (1998) there are some legal institutional frameworks for sustainable tourism development in coastal regions:

- "Multiple activities in the coastal areas require the coordination of many sectoral policies and several public bodies. It is necessary to create a public body to coordinate the dispersed activities, objectives and implementation of different ministries and organizations.
- Sustainable coastal area management requires regional and local initiative to be brought forward. Environmental protection needs the cooperation of local communities, public bodies, voluntary groups, and local NGOs to be effective."

Non-Governmental Organizations (NGOs) role in Development

The rapid developments in coastal regions necessitate more intense cooperation between local and central command research institutions, related sector representatives and NGOs where the effects of certain developments transcend the national boundaries.

Many countries have set some rules that allow States to assist NGOs in their work for protecting natural areas. These rules arm NGOs with legal instruments for land management. States can also allocate some funds to help NGOs in their conservation activities. This may include tax exemptions to individuals that donate either money or land to NGOs (Leitmann 1998).

General Overview about Turkey

Turkey, geographically between east and west; developed and underdeveloped; unsustainable and sustainable, has a coastline, including islands, of 8333 kilometers. Turkey is bordered by four seas. The Black Sea covers the north shores of the country, while the Marmara Sea is basically an inland sea situated in the northwest of the country connecting the Black and the Aegean Seas together. The Aegean Sea extends up to southwest connecting the Mediterranean Sea at south part of the country. Table-1 illustrates the size of coastal zones, coastline and their share in total.

Table-1: Coastline of Turkey, 1985 (Gunay, 1985)

<u>Coastal Zones</u>	<u>Coastline of Mainland</u>	<u>Coastline of Islands</u>	<u>Total</u>	<u>%</u>
Black Sea	1695 km	6 km	1701 km	20.4
Marmara Sea	1189 km	252 km	1441 km	17.3
Aegean	2805 km	679 km	3484 km	41.8
Mediterranean	1577 km	130 km	1707 km	20.5
Turkey	7266 km	1067 km	8333 km	100.0

According to the 1985 census approximately 30% of the population of Turkey, 15.3 million, lived in coastal areas, which covered nearly 14% of the total area of the country. From 1975 to 1985, the ratio of urban population living in coastal regions increased from 47.7% to 64.0% (Gunay 1985; Altaban 1998). It is believed that this rate should be around 70% since past experience shows that southern coastal zones of Turkey posses every potential factor that is needed for economic growth as well as social development. The high-increase of tourism sector is another important factor affecting the economic and social development during the past twenty years. On the average 10 million foreign tourists have visited Turkey each year and 60% of them mostly stayed in the Aegean and the Mediterranean regions.

The most favorable coastal zones are the Mediterranean and Aegean regions because the coastal structure and climatic conditions predominant in both regions make them attractive for resort and summerhouse development. Izmir in Aegean coast and Antalya in Mediterranean coast are the largest urban settlements, each of them having large commercial seaports. Summer houses and resorts, have developed alongside the Mediterranean and Aegean coastal

regions, and have become popular for migratory movements from the inland regions of Turkey. In a recent analysis by Altaban (1998) this issue has been addressed as follows:

"Starting from 1960s onwards the fast rate of the urbanization and the increase of employment in tourism and other service sectors supported by an efficient highway network and well-developed transportation facilities in the western part of Anatolia, Mainland in Turkey, have stimulated increasing demand on coastal regions."

As a result of this, the City of Antalya offers unique opportunities for the international tourism market and it has the largest share in the foreign currency accumulation within Turkey.

Tourism of Turkey

Growth of tourism, as a new sector in the Turkish economy, coincides with the settlement of the 5-year fold economic development plans introduced by government in the mid 1960s. It was soon realized that the tourism sector could be very effective for solving the foreign currency shortage within the economy, as well as support the increase of National income (Altaban 1998). This is an alternative way for the economic development of the country and the main target of planning has been formulated to increase bed capacities of tourist regions.

Many authors (Gunay 1995; Eke 1996; Altaban 1998) strongly believe that tourism planning should also consider all aspects of the demands of native populations while estimating its share in the international tourism market. In other words, we may assert that the conservation, preservation and protection of natural and cultural environment and possessions should take the first priority while developing tourism. In the last three decades, these two approaches have been in conflict, but the former has been more powerful in guiding investments. In 1982, the Tourism Incitement Act was enacted and encouraged the tourism sector through credits, tax exemptions, allocation and provision of the 'fundamental foundation'. This act enables the decree of Council of Ministers to declare 'tourism regions', 'tourism areas', and 'tourism centers'. In particular tourism areas are defined as, "areas inside or outside the tourism regions, where cultural and natural wealth is concentrated, the location and boundaries are decided and declared by the decree of Council of Ministers, following the proposal of the Ministry of Tourism" (Ozhan 1996). This act provided many outstanding opportunities to developers. These include 49 years lease of land, low interest loans, tax exemptions, etc. As a result investments

in tourism development projects have enormously increased after the mid 1980s.

The licensed bed capacity was as low as 55,000 in 1980, but has increased almost six times in fifteen years reaching a value over 300,000 beds in mid 1990s. Table-2 illustrates the licensed bed capacity in coastal regions as of 1996. The South Aegean and West Mediterranean regions have received the highest scores in the provision of tourism facilities.

Table-2: Distribution of Licensed Beds in Turkey

Regions	Bed Capacity	
	1985	1996
Black Sea	3310	7706
Marmara Sea	27260	63777
Aegean Sea	39091	93225
Mediterranean Sea	40991	105801
Coastal Regions	110652	270509
Inland Regions	38080	31015
Turkey	148732	301524

General Information about Antalya

Antalya is located to the center of Antalya Bay in the southwest coast of Turkey. The province of Antalya has 657 km. coastline, 42 km of which is within control of the greater city's municipality. Approximately 10 km of coastline in West Side is under the authority of State Forestry Department. The City of Antalya stretches along the bay bearing the same name and is built at 39 meters altitude above sea level. Mostly cliffs and caves constitute the coastline. Immediately to the north, Antalya is bounded by the Taurus Mountains rising to 3086 meters above the sea level that are interspersed with valleys of varying sizes. Small and large streams emerge from the west side of the Taurus Mountains and then water the plains on their flow to the Mediterranean Sea. On the east and west part of the Antalya plateau, large sandy beaches extend for kilometer's with high sand dunes covered by pine trees.

The plant life of Antalya is extremely varied and every kind of tropical plant can be found along the coast. Visitors to Antalya are struck by the size attained by different species of plants such as cacti. In particular cotton, sesame, citrus, and banana plants have a very diverse beauty of their own, and are hardly encountered to the same extent in other parts of the world (Uysal 1998).

The four climatic seasons only appear on the calendar in Antalya because no real winter exists. The summers are hot and rainless while the other months are warm and often rainy, with a mean annual temperature of 18.7 C and about 309.5 days in a year with no rain.

The population of the City of Antalya has almost doubled every ten years since the 1970s. The present population is over 700,000. Figure-2 pictures how the population of Antalya has been booming and has almost doubled in last three decades, which can be mainly attributed to the higher rate of immigration since the late 1960s.

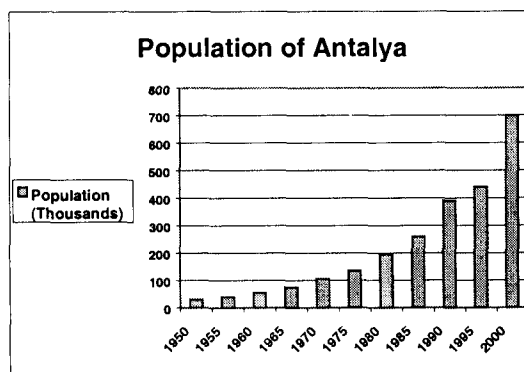


Figure-2: The population of Antalya

History of Antalya

The history of Antalya goes back to antiquity, when it was a part of Pamphilia region. Antalya was founded by Attalos, the king of Pergamum, in 138 BC and became a counter development pole with its natural harbor and easier connections with the Aegean and central Anatolia regions. Main Towns of the Pamphilia region were Thermessos, Attaleia (Antalya), Perge, Aspendos, Silium and Side. Antalya was a naval and commercial center following the occupation by Seljuk Turks in 1207 AD. From the beginning of the 15th Century, Antalya was a part of the Ottoman Empire, and become a city of Turkish Republic after 1923.

Before the development of the tourism sector, Antalya was a sub-regional center controlling commercial and agricultural activities over some part of the Mediterranean region of the country (Altaban 1998). Nevertheless, tourism development starting in the late 1960s has moved this area into a rapidly developing city receiving migration from inland regions of Turkey.

Tourism of Antalya

Tourism of Antalya, affected by the economic and physical structure, has had the largest portion of the licensed bed provision since the 80s. According to the latest statistics, Antalya has 40% of the total existing bed capacity in all coastal regions of Turkey. The largest two tourism development projects, namely the Side and the South Antalya Tourism Projects, have been implemented within the Province of Antalya creating the largest bed capacities. The Province of Antalya has a planned potential of 235,000 beds implemented within its territory, 45,000 of which has already been provided (Gunay, 1995). Such a capacity, created mostly within two decades, would certainly affect both the physical and the economic structure of the city. Many of the current socio-economic problems of the city can be traced to this rapid development of tourism.

Problems and Features:

In Antalya, tourism development activities are directly responsible for serious actions against environmental, socio-economical, and political structures. Among them are the following major issues:

- The population of the city has been almost doubled every ten years since the 1970s.

- Rapid development, alongside the coast in the both east and west, has endangered the cliffs.
- Local governments have welcomed most of the new settlement inquires, disregarding many of the constraints of spatial planning and environmental values.
- Construction in the city is mainly in the housing sector; therefore, there is a large surplus in the housing stock, residential areas are still continuing to erode the agricultural land, coastal zones and forests.
- Land developers are not concerned about the agricultural areas. In addition to this, farmers are attracted by the profits they can make by opening their land to residential development which increase the trends of loss of agricultural lands (Sircan 1998).
- Need for housing persists even though there are many vacant apartments and houses in the city to be sold or rented. Therefore, "the short-run incomes of land developers and the land owner have been far more effective in determination of the present land use in Antalya" (Sircan 1998).
- Cultural and historical assets of the city were, at some points, threatened by new development and the city began to lose its original identity to some extent.
- The urban economy of the city has been revitalized by the progress in the sector of tourism over the province at the beginning. However, at present, tourism has been the most critical economic sector because the urban economy is completely based upon it.
- Social equity should be a major issue in coastal planning and management. Especially, this is mainly important in case of beach access, since some coastal developments have tended to become as prestigious enclave for groups of people. In the coastlines, wire-mesh barriers are still encountered which is a direct evidence of the social inequality experienced by the most of the population.

Proposed Approaches

- Disorganized and uncontrolled development attempts in urban and agricultural lands should be avoided via the control forces of the local government in collaboration with federal government agents whenever necessary.
- Governments should update their environmental, coastal and tourism policies according to developing needs of the regions. Once these updates are put in action, they should persist in their implementation.
- A more strict taxation system can be put forward by local governments on the urban properties.

Both differentiation of taxation combined with urban zoning and increasing the cumulative level of taxation could be a useful tool in allocating the land and resources of the city. We could expect that this will block the desires of the land developers to some extent.

- In the city district, construction permits and zoning regulations should be released in relation with infrastructure.
- Tourism development should be designed to be long lasting in order to increase feasibility and avoid over-crowding in certain periods.
- Governments should revise the tourism policies aiming at mass tourism in such a way that will allow the development of soft tourism which is more environment friendly.
- Sustainable tourism development should imply a harmonized relationship between the protected environment and economic growth. This can be done by implementing sustainable tourism in such a way that will not consider the tourism in the region as a prime alternative for increasing national income and closing the trade gap of the country.
- To choose development areas in the city limiting factors and thresholds should be taken into account. For instance, the cliffs in Antalya have a quality of a seldom-seen present from nature which should be protected and valued together with the their landscape. Moreover, same sensitivity should be shown for protecting the natural beauty of coastlines and beaches.
- NGOs should release information to the public and try to make people more sensitive about the environmental issues within their neighborhoods.

Conclusion

Looking to the future, there are indications that the growth of tourism in coastal regions of developing countries such as Turkey would probably be subject to two current global trends. First of all, in the upcoming years, economic output of international travel and tourism should be expected to grow more rapidly. This fact would predictably affect the touristic coastal regions of developing countries more than the others would. Secondly, tourism development in the city of Antalya in Turkey and other similar countries will be determined by the growing interest in, and demand for, "specialty" tourism. In particular, it might be expected that nature tourism would grow in considerable extent by the increasing environmental awareness. Apparent global warming trend and rise in sea level are extremely important global challenge whose results should be carefully planned and managed to minimize its effects on coastal tourism.

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THE ROLE OF AVOCATIONAL ARCHAEOLOGY AND HISTORY IN MANAGING UNDERWATER CULTURAL RESOURCES: A MICHIGAN CASE STUDY

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Abstract: Increasingly, diminished monetary resources to pay for full-time or project-based professional archaeologists limits the scope and speed with which professional archaeology occurs, particularly for underwater resources such as shipwrecks. However, such resources are being found with increasing regularity; human activity on wrecks combines with natural forces to degrade the wrecks -- whether intentionally or unintentionally -- and reduce the amount of knowledge to be gained from them. More easily accessible due to technology developments, such resources are difficult to protect through access restrictions, enforcement and litigation. Thus, alternative strategies must be considered. Avocational programs, both in underwater archaeology and maritime history research, are being developed in Michigan and elsewhere as a way to help document, assess and monitor these wrecks and develop an ethic of stewardship.

Introduction

Increasingly, diminished monetary resources to pay for full-time or project-based professional archaeologists limits the scope and speed with which professional archaeology occurs, regardless of location. However, this is particularly true for underwater cultural resources that often are considered "out of sight, out of mind." Nevertheless, the value of and interest in such resources are extensive and growing, particularly with release of the recent movie *Titanic* and the blockbuster *Titanic* exhibition in Chicago, which have popularized intrigue with shipwrecks. Additionally, technology advances have increased diver and ROV (remotely operated vehicle) access to once-remote submerged resources, thus increasing potential for human impacts, many of them ultimately destructive to the vessels, artifacts, and the knowledge contained therein. Because such resources are "hidden" from sight, and often located in remote areas, they are difficult to protect through access restrictions, enforcement and litigation; therefore, alternative strategies must be considered. Building on depreciative behavior literature (including using communication and education as a resource management tool), exploration of selected avocational underwater archaeology programs, and a recent Michigan study of the shipwreck discovery process, specific recommendations for cooperative approaches are presented. In this proposed model, avocationalists (archaeologists, historians, interpreters) can work with professionals to protect submerged resources while simultaneously increasing their own awareness, understanding, appreciation and stewardship as well as sharing their experiences and knowledge with others.

Win-Win as the Basis for Partnerships

Controversy swirls around the topic of shipwrecks, particularly when motives of salvors or "treasure hunters" and archaeologists are discussed together. This issue is so constant that it even forms the basis of an exhibit panel at the recently opened *Treasures of Texas* museum in Port Isabel, Texas that focuses on maritime history and shipwrecks. Those involved in the debate appear to represent "different sides," yet the controversy, arising from strongly held values and reinforced by the passion of various stakeholders, is rooted in similarity: interest in and concern for protection and appropriate use of historic shipwrecks. However, what is deemed "appropriate" often is at the center of the debate. To this debate stakeholders on all "sides" bring their personal experience, academic or avocational perspectives and priorities, professional philosophies, personal values, policy and politics, economic arguments, and legal underpinnings -- all of which can create a tangle of issues that involve ownership (legal and perceived) of the resources, rights (individual and societal, private and public), attendant responsibilities (or lack thereof), short and long term impacts, and natural versus human impacts.

The issues are debated within an external context of constantly changing factors. Technology advances increase access to once-remote submerged resources, thereby increasing potential for destructive human impacts. New laws and new interpretations of old laws have implications for ownership, values and uses of these resources. Target dates for designating resources as "historic" or eligible for the national historic register constantly change as the calendar does. Environmental processes (e.g., currents, ice, storms, chemical and electrolytic processes, native and invasive biological impacts) and human activities (e.g., dredging and pipeline-laying, land and water-based activities resulting in water pollution, fishing, anchoring, vessel-caused wave action, recreational activities, and shoreline stabilization projects) continually impact the resources. Political priorities change, and with them so do budget allocations. Public opinion, constantly in flux and often influenced by news and entertainment media, also impacts the debates.

In Michigan, as in much of the United States, suspicion and distrust are directed at "the government" by some people. Concurrently, government employees charged with protecting, preserving or managing underwater cultural resources often are frustrated by citizens who disregard or fail to respect and understand the government's role and responsibilities as "caretakers of public goods." Often they feel disempowered to meet legal and mission-based mandates due to limited staff and financial resources. Thus, managers feel hamstrung and private citizens feel that their rights are impinged upon by government restrictions.

Battles -- attitudinal, verbal, behavioral, and legal -- have seemed to define many of the past relationships and activities related to underwater cultural resource use, study and protection. The challenge is great; the issues are complex. Within this controversial context, there is need to tear down the battlements, to look for common ground, and

to develop solutions rooted in win-win approaches. Avocational efforts can provide one approach to win-win and can contribute extensively to the documentation and historical understanding of shipwrecks and other submerged cultural resources. However, to assure win-win, avocational efforts must be conducted through cooperation of multiple stakeholders, including recreational/avocational divers and historians, designated resource managers, professionals (e.g., archaeologists, recreation and resource managers), and associated government organizations (e.g., law enforcement, educational entities, legal and policy development units). Thus, partnership development, collaboration, and/or co-management are necessary. Win-win partnerships, to be successful over the long term, must engage in approaches that objectively assess specific resources and resource sites, assess alternative uses and management approaches, and empower stakeholders to contribute as well as receive benefits.

The Michigan Context for Avocational Underwater Archaeology

Public Act 184 (revised in 1988 by Public Act 452) first designated Michigan bottomland preserves. Ten underwater preserves have been designated, with final approval currently pending for one additional preserve. However, no state funds, though authorized, have ever been appropriated for their management; rather, any management, operational, and interpretive or educational efforts are the responsibility of local volunteer preserve committees. Preserve committee membership and activities are uneven across the preserve system, and have been uneven over time as interest, time and individuals shift.

One state preserve (Thunder Bay) currently is under consideration for additional designation as a National Marine Sanctuary, which would focus on protection of a significant collection of historic shipwrecks rather than a single vessel (e.g., *Monitor*) or the natural aquatic resources, as are other national marine sanctuaries managed by NOAA (National Oceanic and Atmospheric Administration). Various management models, including a state/federal partnership, have been considered; a final decision by the governor is pending. Such a partnership could provide stability and some federal funding for preserve/sanctuary management and serve as a model for others. In the meantime, all preserves continue to rely on volunteer efforts.

Avocational underwater archaeology programs were first developed in Michigan in 1989, with the first program training about 60 students. An additional course, proposed for 1990, was canceled because too few people were registered. Potential reasons -- market saturation and lack of projects on which graduates could work -- are discussed in more detail later. Some graduates of the first program still are actively involved in shipwreck documentation and historical research. No additional training was offered in Michigan until October 1999. Nevertheless, avocational and recreational shipwreck discovery activities continue. No laws, official policy, or permit requirements specifically restrict search and discovery activities, though permits are required for activities that physically alter sites or the

wrecks themselves (e.g., dredging, excavation, artifact removal, attachment of signs or monitoring pins).

Data and Information Sources for Avocational Program

This paper incorporates information from depreciative behavior literature (with a focus on reducing human-caused damage to resources), results from a shipwreck discoverer research and outreach project, input from a group of recently trained (Nautical Archaeology Society [NAS] Level I) avocational archaeologists, and discussions with Canadians involved in avocational underwater archaeology and maritime resource protection through non-governmental organizations (NGOs). Most of the work has been conducted in Michigan; however, because Ontario shares the Great Lakes basin with the United States, Canadian perspectives and approaches are included.

Newly discovered shipwreck assessment and monitoring project. In 1998 the Center for Maritime and Underwater Resource Management (CMURM) at Michigan State University (MSU) received a grant from the Michigan Coastal Management Program to develop recommendations for assessment and monitoring of newly discovered shipwrecks in Michigan waters. It is believed that between 1,100 and 1,400 such shipwrecks lie on or embedded in Michigan bottomlands. Michigan legally has the responsibility to protect and preserve, for the public interest, the abandoned historic shipwrecks it owns. It quickly became apparent that studying assessment and monitoring activities, and stakeholder attitudes about such activity, could not be done without also considering the shipwreck search and discovery process. To gather input from as many stakeholders as possible, a six-component process was developed, to include: (1) a review of relevant federal and state/provincial law, policy, and practice associated with Great Lakes shipwrecks; (2) a mail survey of Great Lakes shipwreck discoverers; (3) two modified nominal group workshops with shipwreck discoverers; (4) a workshop on shipwreck assessment and monitoring involving stakeholder group representatives; (5) a telephone survey of Great Lakes shipwreck resource managers (U.S. and Ontario); and (6) two current shipwreck discovery case studies.

Round table discussion with avocational underwater archaeology trainees. In early October of 1999, 26 people participated in an underwater archaeology and maritime historical research training program. The program, developed in response to results of the shipwreck assessment and monitoring project, offered two training tracks: (1) the Nautical Archaeology Society's (NAS) Level I underwater archaeology program; and (2) conducting maritime historical research, structured around development of nominations for the National Register of Historic Places. While all participants were introduced to concepts in both tracks, each participant chose to focus on one of the two tracks during parts of the two-and-a-half-day program. The two-track approach was used (1) to broaden knowledge in all participants about the varied topics and processes involved in understanding, researching, and managing shipwrecks, and (2) to encourage interaction and partnership development among people having varied

interests in maritime history, shipwrecks, and other maritime cultural resources. During the final day of the workshop, all participants engaged in a guided discussion about shipwreck documentation and management, their interest in and ability to participate in future shipwreck documentation projects, factors that would facilitate their participation, and their ideas about overall access to and management of shipwrecks.

Characteristics of Canadian avocational programs and organizations. As part of a 1998 Canadian Studies Faculty Enrichment Grant, sponsored by the Canadian Embassy to encourage U.S./Canadian relations and partnership development, a series of guided interviews was conducted with provincial ministry personnel, resource management agency employees, and several members of the avocational groups Save Ontario Shipwrecks (SOS) and Preserve Our Wrecks (POW). Discussions involved the roles, structure, activities, contributions and challenges of avocational underwater archaeology, maritime history, and maritime preservation organizations working either independently or in partnership with governmental organizations.

Theoretical Perspectives Applied to Reducing Depreciative Behavior

Concerns of resource managers, historians and archaeologists with regard to underwater cultural resources include physical damage to the resources and loss of information from those sites due to irresponsible human actions. A body of theory has developed to help explain reasons that people engage in depreciative behaviors, including those that negatively impact natural and cultural resources. By understanding the motives, precursor variables, and intervening and other contextual variables that contribute to depreciative behaviors, managers can develop relevant strategies to discourage such behaviors and, thus, minimize the damage. While numerous theories have been applied to resource management situations and have relevance for underwater cultural resource management, they can not all be discussed here. Key concepts only are presented; a more complete summary is available in Vander Stoep and Roggenbuck (1996) and Anderson, Lime and Wang (1998).

Motives. People engage in behaviors for many reasons. Motives for behaviors that potentially result in damage include intentionally destructive behaviors (malicious vandalism or behaviors engaged in to achieve some other goal, such as to acquire an attractive or valuable souvenir -- a block, a bell, a brass porthole frame); status-confirming behaviors, or peer pressure ("I was the first to dive wreck X, and here's the nameplate, or bell, or capstan cover to prove it!"); and careless, unskilled, uninformed or unavoidable actions that result in unintentional or inadvertent damage (such as when a diver breaks off a piece of wreck while grabbing it to control buoyancy or get a closer look into a hatch) (Gramann and Vander Stoep, 1987; Roggenbuck, 1992). The management strategy selected should address the reason for the damage-causing behavior rather than being applied uniformly to all people in all settings. Education and skill development would be more appropriate than legal threats and imposed sanctions in minimizing diver damage to shipwrecks in most cases,

yet legal actions are necessary in others. The role of avocational underwater archaeology will be discussed further as regards its role in protecting resources and developing a stewardship ethic.

Precursor variables. As with any human behavior, a variety of precursor variables affect behavioral intentions and, ultimately, actual behaviors or actions. Among these are cognitive structures such as beliefs (including beliefs about impacts of specific behaviors on personal, social, physical and economic outcomes), values (e.g., economic, historical, and recreational values of shipwrecks), and attitudes that interact to influence activation of personal norms in given situations (Heberlein, 1972; Schwartz, 1977; Ajzen and Fishbein, 1980; Ajzen, 1985). So also do a person's beliefs about what others (peers, family, society) think about what their behaviors should be in various circumstances (Ajzen and Fishbein 1980; Ajzen 1985). Peer pressure, especially of significant or salient "others" (such as dive buddies or dive heroes) falls within this realm. Locus of control (an individual's belief about personal ability to impact or control outcomes) and a related phenomenon, called "ascription of responsibility" by Heberlein (1972) and Schwartz (1977) (placement of responsibility--self, others, external environmental factors--for specific outcomes or for personal behaviors), also have implications for the effectiveness of avocational underwater archaeology programs, particularly in protecting shipwrecks through development of stewardship values and behaviors. Finally, a person's knowledge about given objects, processes and situations, including about the impacts of specific behaviors on others or resources (labeled "awareness of consequences" by Heberlein [1972] and Schwartz [1977]), affects their behavioral decisions. Other social scientists indicate that a person's level of moral development strongly affects their behavioral choices (Kohlberg et al., 1983; Dustin et al., 1989).

Contextual variables. A variety of contextual or environmental factors present in any given situation can alter intended behaviors (e.g., excitement about being at a new dive site leading to careless dive behavior; equipment or physiological problems leading to use of a shipwreck structure for personal support that simultaneously results in damage to the vessel). Inappropriate behavior also can occur if a person believes there is a low degree of behavioral choice (e.g., the equipment failure scenario); they can shift blame (e.g., "my more experienced dive buddy said it was OK to take pieces of pottery from the wreck" or "winter storms will cause more damage than my fin kicks or moving the telegraph handle") (Heberlein, 1972; Schwartz, 1977); or visual clues, called releaser clues (Samdahl and Christensen, 1985), indicate that certain behaviors are engaged in by others and, therefore, must be acceptable (e.g., a row of plates and brass hardware lined up by previous divers on a deck railing for easy viewing and aesthetic photos).

Discussion: Developing Win-Win Approaches Based on Study Results and Theory

In developing successful win-win partnerships to engage and empower people while simultaneously protecting the

resources, both barriers and facilitating factors to avocational involvement must be considered. When asked to identify barriers to discovery, documentation and monitoring activities, experienced shipwreck discoverers as well as newly trained avocational underwater archaeology divers and maritime history researchers describe personal factors (distance, limited time and money), environmental and logistical factors (unpredictable lake and weather conditions, freighter traffic, lack of nearby support services and facilities), government restrictions and "bureaucratic attitudes," and difficulty maintaining secrecy about their activities. Government staff indicate the challenges of and their frustrations with uncoordinated discovery of so many shipwrecks (often by avocationalists) without plans, financial resources, or human resources to conduct post-discovery research, to monitor and manage the sites, or to conserve any artifacts that might be recovered. This, they believe, is irresponsible. Development and regular use of a cadre of skilled and dedicated avocational documenters, archaeologists, and historians could help fill the existing "gap" by involving them in post-discovery documentation, assessment, and monitoring. It is hoped that their active involvement would simultaneously increase their understanding of multiple values of shipwrecks, expand awareness of the vast amount of "hidden" information held within sites, and help develop in them a sense of responsibility and stewardship about the shipwrecks' long-term care. Involvement of non-divers in historical research, development of interpretive and educational materials, and other activities could expand contributions to both cumulative knowledge and stewardship of the resources.

Discoverers and other avocationalists indicate that their activities are or could be facilitated by easier access to a variety of historical resources and helpful individuals (e.g., fishermen, archives, technical assistants), access to appropriate technology, minimal legal restrictions, simple and rapid permit process for site alteration as needed for documentation and archaeology, and the ability to earn money for shipwreck-based products (e.g., books, videos, CDs). Additionally, they indicate that incentives (such as tax deductions for money spent during discovery, documentation and other research activities; reduced or no-cost dockage for boats at public marinas near shipwreck sites; loan of high tech equipment; provision of trained underwater archaeologists with whom to work; access to a list of trained avocational divers; choice about project crew members; and voluntary as opposed to imposed or forced collaboration) would go a long way in facilitating their voluntary involvement as project partners with government entities. Newly trained avocational divers indicate a willingness to participate in partnership documentation and historical research projects. They recommend many of the same incentives and indications of need for government trust and support of their efforts, but prefer that someone more experienced (and with adequate time to dedicate) take the leadership and responsibility of organizing, planning and coordinating shipwreck documentation activities.

Collectively, research results indicate that current models for avocational underwater programs focus primarily on diver techniques. While this approach does increase divers' skills and knowledge, and results in their contributions of

time and research results, the approach is exclusive. Many non-divers also have a strong interest in shipwrecks and maritime history, and can contribute extensively to shipwreck projects. Many participants in studies referenced in this paper strongly recommend that avocational partnership programs expand beyond involving only divers, professional archaeologists, and government resource managers. They suggest that partnerships include underwater preserve committees, universities, museums, local historical societies, educators, school and youth groups, tourism and economic NGOs, and anyone else interested in maritime history, especially in coastal towns. Such a model takes more effort to plan, coordinate and implement, but is more inclusive and ultimately results in expanded benefits, both in the number of people involved and in their long-term contribution to research, monitoring and education related to maritime history and shipwreck management.

Additional recommendations emerging from the collective research can be categorized into (1) personal training and involvement factors, (2) partner involvement, (3) application of individuals' skills to specific projects, and (4) development of a coordinating organization.

Personal training and involvement factors. Some people indicate an interest in optional formal acknowledgment of their participation in or completion of training courses. Examples include Continuing Education Units (CEUs), university credits, certifications recognized nationally or internationally (e.g., NAS certification), or specialty dive certifications connected with existing dive training associations (e.g., PADI, SSI, NAUI). Such "proofs of training" could be required for approval to work on project teams, though many discoverers want to reserve the right to hand-select their project teams.

Partner involvement. Involvement of local stakeholders in partnerships for both training and subsequent project work is critical. Local dive shops might (1) provide divers for workshops and documentation projects, (2) provide a certification card (connected with existing certification programs) for those wanting it, (3) enhance and encourage cultural resource stewardship through inclusion of such topics in all their training programs and charter trips, (4) receive a portion of course fee profits for co-sponsoring training programs, (5) promote training courses in their newsletters, and (6) actively develop relationships with local historical associations. Similar lists of potential contributions could be developed for other stakeholder groups, such as the local historical societies. Local historical societies could focus on conducting historical research and developing nominations of sites or shipwrecks for the National Historic Register. Preserve committees could offer their site(s) as training and project sites and specify priorities for their preserves, then organize and coordinate the avocational efforts.

Application of individuals' skills to specific projects. One of the factors deemed most detrimental to long-term interest and involvement of trained avocationalists is the availability of easily accessible, specific shipwreck projects in which they can be involved. While participating in a

training course does enable divers to better appreciate and enjoy their recreational dives as a result of increased knowledge about what they're looking at, most want to be involved and have ways to apply, practice, and improve their skills. Without these opportunities many may become discouraged. Therefore, training programs should be conducted in areas that have some kind of existing local organizational interest, such as a maritime museum, underwater preserve, or active dive club. Also critical to success is development of a centralized data/information collection and storage site. Initially, while projects are in progress, a local museum or preserve committee could coordinate the efforts and provide the space and equipment. Ultimately, a statewide (or province-wide, or other locally relevant structure) database, most of which is accessible to the public, should be developed and maintained.

Development of coordinating organization. Active avocational control or cooperative control of their activities is important. Most agree that some type of coordinating entity or organization is needed so that efforts can be coordinated and people have a central place to go for information and to find project partners. Save Ontario Shipwrecks (SOS) often is viewed as an example of a successful NGO. However, as with any organization -- especially those operated exclusively or primarily by volunteers -- there are characteristics that both contribute to their success and can create challenges to long-term success (also evident in Michigan's underwater preserve committees). Positive characteristics of volunteer organizations perceived by members include: (1) sincere interest in the mission of the organization; (2) perception of organization leaders as peers who thus have perceived credibility; (3) self-governance and autonomy in developing and implementing projects; (4) the potential and flexibility to partner with other organizations to achieve goals; (5) ability to fund-raise without constraints of a government organization; and (6) production of significant contributions to resource knowledge, resource protection, and community education. Potential threats to long-term viability of such organizations include: (1) disagreement among leaders or members about the organization's mission and priority activities; (2) changing needs and priorities over time; (3) burn-out of the most active leaders and members; (4) power-grabbing or power-hoarding by individuals if the organizational structure does not ensure multiple stakeholder or regional representation and does not provide for regular change in the leadership; (5) challenges to fiscal accountability if no system of checks and balances is built into the system; (6) uneven activity across time (and members) as members have varying personal and work demands placed on their time, energy and resources.

If NGOs are structured to minimize threats to long term survival, they can provide experiential benefits to members and simultaneously contribute to project work and knowledge creation. Maintaining regular and effective communication among members; periodic review of mission, activities and outcomes; and having established criteria and processes for dissolution also are important to long-term success. However, regardless of the passion, skills and contributions of NGOs, many believe that some

type of partnering or contribution via government is important to development and long-term viability of win-win partnerships. Recommendations for government (broadly to include the academic and professional archaeology community) organization involvement include: provision of continuity and/or stability, preferably through a dedicated position, such as marine archaeologist; availability of technical assistance; development and maintenance of a publicly accessible central database, information clearinghouse, and archives; provision of recurring seed money; provision of facilitating legislation and policy; and contribution of incentives, such as tax deductions and low-cost docking fees, for volunteer work contributed on approved projects. Such an approach would increase the number of people and resources available to conduct the work (benefit to resource managers), provide some financial and technical assistance to avocationalists, and protect and selectively make available underwater resources for use in recreation, education and tourism.

Education, Training and Involvement as Part of Win-Win

Repeatedly, on surveys and in discussions and interviews, education is identified as a crucial factor in developing knowledge and appreciation of underwater and other maritime cultural resources, in developing an ethic of stewardship toward the resources, and in reducing depreciative behavior resulting in damage to and theft of the resources. Educational target audiences include recreational divers, charter operators, local communities -- residents, business people and local officials, youth, and non-diver tourists. Educational messages include the stories of people, events and historical context associated with ships and their wreck events; diving skills; technical skills associated with documentation and archaeology, shipwreck construction; and values of information contained in intact wreck sites. Training and involvement of avocationalists -- to assist with maritime historical research, shipwreck documentation, assessment and monitoring, writing of nominations for the national register, development of educational and interpretive materials -- link strongly with these educational concepts and outcomes.

Clearly avocational involvement itself, as well as use of resulting information and work, contributes to win-win in preserving, sharing and using maritime heritage resources. Under fiscal and human resource constraints, the work simply cannot be done entirely through traditional academic and governmental channels. Even if funding and staff were sufficient to conduct all the work, benefits that accrue through public interest and involvement would be lost. Other professions already are recognizing and reacting to this philosophical shift. In the museum world -- whose professionals traditionally were collectors, researchers and curators of objects and artifacts -- philosophies and approaches are shifting to using public and community involvement to identify, research, develop meaning, and share their heritage and their past. Thus, museums are used as tools for community development. Community stakeholders participate collaboratively with museum professionals in creating the meaning in the stories of their lives, and in developing exhibits and other ways to share those stories.

Increasingly, perhaps in efforts to temper some of the depersonalization created by over-saturation of technology in daily lives, people are seeking unique and authentic experiences. Involvement in avocational programs not only addresses this personal need. Avocationalists provide the labor and love to assist with archaeology and knowledge generation; they benefit from working with experienced professionals; they develop a sense of pride, ownership and stewardship for the resources; and they share their passion with others. There will always be those few with self-centered or destructive motives, but their behaviors should never discount the interest and contributions of the vast majority of people who, if provided the education, training, and opportunities to work with professionals, can contribute significantly to creating win-win for society, for the resources, and for themselves.

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TORNADO CHASING: AN INTRODUCTION TO RISK TOURISM OPPORTUNITIES

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Abstract: Tours devoted to tornado storm chasing have become popular in recent years, especially with the emergence of many profit and non-profit storm chasing organizations. While most literature in risk recreation has been directed toward rock climbing or other high-risk outdoor recreation activities, tours devoted to storm chasing are quite unlike these traditional activities. The purpose of this paper is to provide a review of these organizations from information collected in a mailed survey. Areas to be discussed are specific tour details for each company, basic demographics of tour attendees, and other areas of tour requirements. **Keywords:** Risk tourism, tornado chasing.

Introduction

Since the movie "Twister" premiered in 1995 there has been increased interest for storm chasing. The activity of storm chasing requires participants to locate and "chase" after a tornado-producing super-cell thunderstorm. Although this is an extremely risky activity, storm chasing is becoming a popular form of tourism. For example, storm chasing is a sport not unlike rock climbing, in that to participate in either activity you must first have an understanding of basic techniques and safety measures. Further there is some level of danger associated with the activity. Americans are more now than ever likely to engage in high risk outdoor activities (Ewert and Schreyer 1990; Greenfield, 1999, McGraw 1998). Although storm chasing is considered a new tourist activity, it has existed since the late 1940s; only now it is becoming a popular form of tourism.

Risk recreation traditionally has been applied to rock climbing, mountain biking etc. (Ewert 1995, Hollenhorst 1995). This paper explores a new form of risk tourism: tornado chasing. To get a better understanding of this new phenomenon, a short survey was sent to the six major operators that provide storm-chasing opportunities to the public. The survey was designed to solicit information about the clients served, basic tour information and some motivations of the clients. This paper highlights the findings.

History

Essentially storm chasing began after World War II. The reason it came about was because an abundance of

airplanes and pilots that had a working knowledge or radar technology were given an opportunity to study storms first hand by flying through them. This research project, which operated out of Ohio and Florida, became the baseline for understanding tornado-producing storms. Along with the beginning of storm study, highways were modified, helping to bring the chase from the air to the ground.

The Tornado Intercept Project, based out of Norman, Oklahoma was the first organized ground-based group of storm chasers. This project was sponsored by the National Severe Storms Laboratory (NSSL) to conduct research about storms that cause tornadoes and the effect they have on communities located in the region known as Tornado Alley. The project was declared a success on May 24, 1932 when the scientists and chasers met face-to-face with a tornado in Union City, Oklahoma. This is also where one can see storm chasing being born as a hobby rather than just for scientific reasons (Marshall 1993).

Tornado Formation

Many prospective tornado tourists need to have a rudimentary understanding of tornadoes and how they work. A brief description of what a storm chaser should know about tornadoes follows. Tornadoes are produced as a thunderstorm develops an organized internal structure of sufficient strength to extend the vortex from the cloud base to the ground. The severe thunderstorm that develops a tornado is normally the largest thunderstorm in a squall line or a very large isolated thunderstorm. These storms are able to produce tornadoes because they have the organized internal structure that can support a tornado.

Risk Recreation Defined

Unlike traditional risk recreation, storm chasing uses its own definition that is geared towards just the act of storm chasing. Traditionally, risk recreation is a self-initiated activity in a natural environment that people partake in due to the activity's uncertain and potentially harmful nature and it's cognitive and affective involvement (Robinson 1992). In terms of storm chasing, the following definition is utilized: the recreational pursuit of an uncontrollable meteorological event (Cantillon, et al 2000)

Storm chasing is an activity that is associated with many risks, and those that chase storms should be aware of these risks. There have not yet been any media frenzies concerning the death of a storm chaser, but many think that when this happens, regulations and sanctions will be put into effect that will alter one's ability to chase a storm effectively (Doswell 1998). For example, climbing Mount Everest is an activity that people participate in, and there are many recorded deaths of such attempts. This fact has not discouraged a lot of people from climbing the mountain, and similarly, any fatalities that may occur during a storm chase should not effect the way that chasers conduct themselves while hunting a storm.

Storm chasing can be considered a risk tourism activity. Although it was initiated for scientific purposes, there are many that chase simply for the joy of the chase. "The thrill for storm chasers is tracking nature out of control, finding themselves eye-to-eye with...the great grand-sucking twisters of Tornado Alley" (Paddy 1994:32). As with any recreational activity, there is a challenge to chasing, and it seems as though there is more challenge and frustration to chasing than a lot of other activities. Storms are not spawned on command. Nature acts in mysterious ways and there has yet to be a method of knowing exactly when and where are tornado will hit. Tornado chasing is basically a guessing game with some help from scientific information to make these educated guesses. Besides the thrill of the chase, "what compels storm chasers to drive tremendous distances across the plains?...You can see forever...the sky and the air are clear, and what you see is tremendous—it's simply awe-inspiring" (Wolkomir 1994:52).

Another way that storm chasing is a recreational activity is that there has been an increase in those interested in storm chasing, causing a noticeable influx in traffic on prime chase days. According to research by Wolkomir (1994), there are so many storm chasers out there that on prime chase days there are too many cars on the roads to drive. If storm chasing was not a popular activity, there would not be such a demand for space for these chasers.

Table 1. Storm Chasing Groups to Contact on the Web

Cloud 9 Tours	http://www.pair.com/storms/cld9.html
Silver Lining Tours	http://silverlining.pair.com/chase.html
Storm Chasing Adventure Tours	http://www.storm-chaser.com
Tornado Alley Safari Tours	http://www.pair.com/talley/tours.html
Tornado Research and Defense Development (TRADD)	http://www.abilene.com/tradd
Widespread Weather Services	http://www.widespread.com

These tour groups have different packages to offer, with a range of prices, tour lengths, and requirements. The following tables outline some of the major similarities and differences between the various tour groups. It must be mentioned that Widespread Weather Services, Cloud 9 Tours, and Tornado Alley Safari Tours responded to the mailed survey, while the information for the other tour

Data Collection: Storm Chasing Tour Groups

This section of the paper gives some information about what exactly is entailed in a storm chasing package, and web sites are provided for those that wish to seek out additional information. Many people wish to try such a thing and joining one of these groups is the perfect way to enjoy an experience of a lifetime.

Storm chasing in the past has mainly been done for scientific reasons rather than for pleasure or recreation. Now that more people have become interested in storm chasing, it has opened a door leading to a new hobby. Since it is not a hobby that you can pick up very easily, there are experts that you can seek and join their storm chasing expedition. Often, they may consist of expert storm chasers that do not mind having a novice along for the ride. They operate in a territory throughout Tornado Alley.

A short survey was sent to the six companies that cater to storm chasers in the United States (Appendix A). Three or 50%, responded to the request. A summary of all six companies follows, with information from the survey as well as web based literature. Table 1 lists the six companies and their web site.

companies is based on information found on their web pages during the winter of 1999/2000.

Table 2 shows the length of tours offered by each of the companies. Most of the tour lengths are relatively the same with a few exceptions. TRADD offered the shortest of the six tour options, and Widespread is the only group to offer a choice of one or two week packages.

Table 2. Length of Average Tour

Cloud 9 Tours	14 days
Silver Lining Tours	10 days
Storm Chasing Adventure Tours	14 days
Tornado Alley Safari Tours	8 days
TRADD	5 days
Widespread Weather Services	7-14 days

At first glance, Tornado Alley Safari Tours may appear the least costly as the cost per day is only \$113 (see Table 3). This is misleading, as it needs to be remembered this is only an eight-day tour. In reality, the most cost-efficient tour (based solely on cost-per-day information) would appear to be either Cloud 9 Tours or Storm Chasing

Adventure Tours, each with a cost-per-day of \$143. The most costly tour is TRADD at \$234 per day. This cost is lower in comparison to Silver Lining Tours, which has a cost-per-day of \$240, but TRADD only runs for five days while Silver Lining Tours provides a ten-day tour.

Table 3. Average Tour Cost

Cloud 9 Tours	\$2,000 - \$143 per day
Silver Lining Tours	\$2,400 - \$240 per day
Storm Chasing Adventure Tours	\$2,000 - \$143 per day
Tornado Alley Safari Tours	\$900 - \$113 per day
TRADD	\$1,170 - \$234 per day
Widespread Weather Services	7 days - \$1,750 - \$250 per day – 14 days \$2,750 - \$196 per day

From information from the survey or web sites, the tours offer similar amenities. No tour includes airfare to their base city in their tour price. Some of the companies cover snacks, drinks, and meals while others do not. Both Widespread and Cloud 9 include a video of the experience.

Tornado Alley Safari provides training in chasing as included in tour, but most of the other tours are assumed to provide this as well, given the nature of the tour. See Table 4 for a summary.

Table 4. Tour Package

Cloud 9 Tours	Lodging, T-shirt, Highlights video, Snacks
Silver Lining Tours	Daily snacks and drinks, Ground transportation during tour
Storm Chasing Adventure Tours	Does not cover meals
Tornado Alley Safari Tours	Ground transportation, Forecasting services, Instruction in chasing/watching
TRADD	No information available
Widespread Weather Services	Lodging, Pick-up/Drop-off at airport, Travel during tour, Highlight Video

The tornado season is in the late Spring and early Summer. Table 5 shows the frequency of tours per season for each company. Widespread offers the most chances for people

to take a tour, which would cater to many different schedules of the tourists. Tornado Alley Safari has the least amount of tours, with only two per season.

Table 5. Tours Per Chase Season

Cloud 9 Tours	3
Silver Lining Tours	No information available
Storm Chasing Adventure Tours	5
Tornado Alley Safari Tours	2
TRADD	9
Widespread Weather Services	10-12

As can be seen by looking at Table 6, these tours are for small groups. This is undoubtedly due to the fact that people are being carted around in vans with varying amounts of equipment and luggage. This is also probably due to the fact that each tour group does not have a large

staff, typically only 3, and can only carry as many people as available drivers of vehicles. This limits the number of tourists since they share space with scientific equipment in the vans.

Table 6. People Served Per Tour

Cloud 9 Tours	14, possible 20 people
Silver Lining Tours	No information available
Storm Chasing Adventure Tours	No information available
Tornado Alley Safari Tours	9 people
TRADD	No information available
Widespread Weather Services	1-8 people, more if necessary

The survey next queried information about the clients who participate in storm chasing. Table 7 identifies the general characteristics. All tourists are either out-of-state or out of the country. This is undoubtedly because those people that

live in the area of Tornado Alley are used to the sight of tornadoes, and are probably not thrilled at the prospect of chasing the beast that could knock down their house.

Table 7. Tourist Demographics

Cloud 9 Tours	85% out-of-state, 15% foreign
Silver Lining Tours	No information available
Storm Chasing Adventure Tours	No information available
Tornado Alley Safari Tours	100% out-of-state
TRADD	No information available
Widespread Weather Services	90% out-of-state, 10% foreign

Table 8 shows the universally accepted minimum age of participants to be 18 or older. This is not very surprising. There is always the issue of liability, and at least being eighteen a person is considered an adult. Storm chasing

has a high element of danger, even the chance of putting their life at risk. Solmonsson (1990) warns that companies involved in high-risk activities need to be aware of the different clients abilities, since risk is highly subjective.

Table 8. Age Restrictions to Take A Tour

Cloud 9 Tours	Must be 18 or older *
Silver Lining Tours	No information available
Storm Chasing Adventure Tours	No information available
Tornado Alley Safari Tours	Must be 18 or older
TRADD	No information available
Widespread Weather Services	Waiver signed by a parent/guardian if under 18

Finally, the survey requested additional information about what a tourist should bring on the chase. Tourists are asked to pack as lightly as possible, as all items need to be mobile. People do not stay in the same hotel every night, but are being transported over miles of ground, and may

never make it back to where they originally started. Since waiting was often an element of the chase, participants were also asked to bring a book or music to help pass the time.

Table 9. Items to Bring on A Tour

Cloud 9 Tours	Clothes, Toiletries (1 Suitcase, 1 Carry-on), Money for Souvenirs/Food, Video camera (Optional), Laptop (Optional), Walkman
Silver Lining Tours	No information available
Storm Chasing Adventure Tours	No information available
Tornado Alley Safari Tours	Rain gear, Cameras
TRADD	No information available
Widespread Weather Services	Clothes (1 Suitcase, 1 Carry-On), Cameras, Video camera, Walkman, Video games, Books/Magazines

Discussion

With movies such as "Twister," interest has increased in the activity of storm chasing. This is apparent as seen by the increased traffic along the roads of Tornado Alley and with the institution of many storm-chasing groups. Although storm chasing in real life is nothing like the movies, there is still a real rush that come from seeing one of Mother Nature's most destructive forces. People will pay large amounts of money to have the opportunity to chase after something that most people would prefer to flee. True storm chasers are into this form of risk tourism for many reasons, to learn about tornadoes as much as possible, to help create warnings systems, but mainly to experience the thrill of the hunt.

Since the field of Risk Tourism is relatively new, there is little research in the topic. Future research should consider the risk chasers may place on the citizens who live in Tornado Alley. While most companies stress safety and the scientific gain of knowledge, many rogue and inexperienced operators may attempt to enter the market to

"jump on the bandwagon"! It would also be interesting to explore the psychological "rush" a chaser gets after long dull waits in the great plains, perhaps similar to the changing excitement a river rafter gets during and after rapids. Lastly, a comparison of tornado storm chasers to "hurricane partiers" may be an area to explore. What motivates people to expose themselves to severe weather?

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Appendix A.

I. Please Answer These Questions Based On Last Season's Tours

1. How long does your standard tour run? _____ days
 2. How much does your standard tour cost? \$ _____
 3. What does this cost encompass (i.e. food, lodging, etc.)? _____
-

II. Please Answer These Questions Based On Your Tour Clientele

4. How many people can you serve per tour? _____
5. If you offer multiple tours per season, how many tours do you run _____ and how many total people are served? _____
6. On the average, where are your tour attendees from?
_____ in-state _____ out-of-state _____ foreign

III. Please Answer These General Questions

7. Do you have any AGE restrictions in order to participate in your tours?
_____ yes _____ no

If yes, what are these restrictions?
_____ must be 18 or older _____ must be 21 or older _____ must be under _____ (put age here)
8. Do your clients need to meet any specific educational criteria to participate in your tours?
_____ yes _____ no

If yes, what are these criteria (check all that apply)
_____ high school diploma _____ some college classes _____ college degree
_____ weather-related experience _____ previous chasing experience
_____ other (please explain) _____
9. Are there any major expectations that attendees have to fulfill in order to attend your tours?
(i.e. physical fitness) If yes, please describe _____
10. What are some reasons that people give for attending your tours (i.e. gift, chase interest, etc.)

11. What specific items do your attendees need to bring with them on their tour? _____

COMMUNITY BASED OPEN SPACE PLANNING: APPLICATIONS OF A GIS

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Abstract: The purpose of this paper is to illustrate the usefulness of a GIS in community open space planning of undeveloped recreational opportunities. The study area is a small New England village in the western region of Massachusetts. Like most of the Northeast, Northampton is a rural community with a growing population. Proposals for public recreation lands compete for commercial development.

Introduction

In order to meet the future needs for recreation, proper land use planning must be addressed today. Land use planners employ the technique called a "build-out" in order to plan for future growth of communities. Geographic Information Systems (GIS) is the tool utilized in this build-out since the computer-based analyses are efficient in time and cost. For the scenario here, a build-out scenario of the existing open space is queried to show the impact of population demand on open-space in the study area. Highlighted in this paper will be an overview of the process including steps in data collection, data management and analysis. Data of these types are collected from remote sensed imagery, MassGIS databases and fieldwork. After these steps, data are entered in multiple spatial databases. From these data, open space and existing land use will be evaluated and one can create maps appropriate for analysis.

In order for GIS data to be useful for recreation resource decision-making, alternative scenarios are considered. Alternative scenarios could include a build-out scenario tied with passive public recreational demands or a "no-build" possibility, preserving current land use. Once the GIS analysis is prepared, decision-makers can then make informed choices to provide for growth in the community as well as provide for recreational opportunities.

The reader should be able to recognize the importance of a build-out analysis and the usefulness of a GIS. Through the research presented the reader will develop an understanding of the town of Northampton's open space issues and at the same time develop an understanding of what a build-out analysis can accomplish using GIS technologies.

Background

A Build-Out Analysis illustrates the form and pattern that development can be expected to take under a continuation of current trends and the manner and degree to which this form and pattern are contrary to planning goals (Marriot, 1995). A description and illustration of the consequences of current trends help to identify the kinds of action that are needed and to build public support for these measures (MassGIS 2000). Like many other cities, Northampton will continue to experience more growth. Alternatives to build-out analysis can be time consuming, however, they help provide positive actions towards the recreation environment.

There are three alternatives that are used in mainstream build-out alternatives, 1. No Build – Avoiding development as a whole, 2. Designate open space for recreational purposes such as parks and trails, 3. Use existing resources such as renovated buildings, former hospital grounds and landfill property (known as Recycle & Facilities). These alternatives are vital in the development of build-out analysis.

GIS is very important in the development of alternative build-outs. A GIS can show what open space could possibly look like if development does come into a town. A GIS uses a system of computer software, hardware, data and personnel to help manipulate steps, analyze and present information that is tied to a spatial location or geographic location (ESRI, 2000). GIS are "smart maps" linking a database to maps and layers consisting of many different themes such as rivers, lakes, roads, greenways, landuse, open space, and buildings. Data sources provide documentation of GIS data at various scales. For example, data are available at the global scale and can show continents and watersheds, while at the local scale, one would like to study vegetation or trails (MassGIS 2000). This research analyzed existing open space that could possibly be developed into commercial properties and thus unavailable for passive recreation. Several sites were chosen for possible development based on the greatest amount of open space in Northampton.

Case Study: Northampton, Massachusetts

The City of Northampton, Massachusetts contacted Westfield State College to provide an inventory of open-space properties within the City. The purpose of this study is to examine the open space areas to determine which are of high priority for purchase by the City. The purchased areas would be designated for conservation and recreation to prevent additional resource damage. Therefore, an inventory of vegetation, slope, topography, soil and wildlife was conducted. Three main sites were studied based on areas that the City of Northampton was interested in acquiring. See Figure 1 for the location of the case study area.

Fieldwork included several visits to the open space areas to conduct a natural resource inventory. This included a geographic survey of surrounding land, and adjoining

zoning, brook course, and tributaries; a sampling of vegetation using and a visual inventory of brook obstructions, natural or otherwise.

Parsons Brook is located in south central Northampton, an area that is prime for open space protection. Throughout Parson's Brook's course, it varies in width and velocity. It starts out rather small and slow near the source, often spreading out into a small marshy area for a few yards before resurfacing. Further downstream, the brook begins to widen and pick up more velocity and depth as tributaries and runoff from the roads add to the brook.

There are few man-made obstructions in the stream. And aside from the beaver dam, there are no other major obstructions besides brush and fallen trees. The terrain varies around the stream from slightly sloping to slopes of 15% or more. The vegetation inventory includes various species of maples, ash, pine, ferns and mosses. Soil maps were reviewed to identify the different soil types that surround the stream are typically loams. Wildlife in the area consists of the usual array of birds, raccoons, deer, squirrels, chipmunks and skunks. Beavers are also in the area and have created an impressive system of terraced dams to form a fairly large pond.

Data Collection

In this section of the paper, the details of the resource will be discussed. Starting at the source, the transect moves downstream, section by section to complete the inventory.

Beginning in Parcel 1, the brook surfaces roughly 20 feet from the road and begins its southeasterly course. At this point, the brook is very shallow, often spreading out into a marshy area before collecting into a solid brook. The terrain is fairly flat, with a slight incline to the road on the north side. The soil characteristic of the area consists of Pcb or Paxton very stony fine sandy loam with 3-8% slopes. After about 50 feet, the brook crosses Parcel 2. By this point, the brook has established itself into a single stream. The flow is slow and shallow. The lawns of Parcel numbers 3,4 and 5 (south of the brook) come relatively close to the brook itself, within 10 feet. Lawn debris is piled up in spots along the brook. Fallen trees and old tree stumps block the stream in some places, causing the stream to form small pools. After another 20 feet the yards begin to slope upwards to about 3%.

The brook at Parcels 6, 7 and 8 becomes a bit wider and the velocity of the water picks up. The terrain becomes slightly more inclined on either side of the brook, with the greater slope on the southern side. The debris in the brook still consists of fallen trees, yet there is a picket fence gate thrown over the brook between Parcel 6 and 7. The soil composition has changed to ReB or Ridgebury very stony fine sandy loam 3-8% slopes. Within Parcel number 8, the terrain is increasingly steep with a slope of about 20%.

Parcel 9 is a transition point for the composition of the brook. There is a path running from Burts Pit Road across the brook to the road to the south. At the brook crossing,

there is a makeshift bridge made of an old door, some logs and old planks. There were many bicycle tracks observed on this path, indicating a popular route for local mountain bikers.

The vegetation for this area was relatively uniform, consisting of a few white pine trees, Red maples, Swamp Oak, and Yellow and American Beech trees. Cinnamon Fern as well as Crested and Sensitive were seen in the area as well. Common mosses also grow on the rocks in the stream. Scattered Birch trees are to be found downstream.

At this point, the brook has picked up speed and becomes deeper. The terrain is now steeply inclining on the north side of the brook, and the lawns are now up the hill and about 30 feet from the stream. The southern side of the brook is still slowly inclining, but not yet becoming steep. This area is also marshy in nature and the land surrounding the brook is saturated. The soil content is Ma or Maybid Silt Loam.

Vegetation is denser in this area. It still includes the White pine, Swamp Oak, Red Maple and Beech trees, but there are more Birch trees and several types of low brambles. The same types of ferns exist near the brook as above, and mosses are abundant. Mountain Laurel and Swamp Azalea are also found here. Small chutes of Princess Pine were also noted.

The southern side of the brook begins to slope upwards at a steeper angle when crossing Parcel 11. Tributaries begin to join the brook at different intervals on both the northern and southern sides. By the time the brook reaches Parcel 12, the topography is very steep on both sides and the vegetation consists of mainly White Pine and Hemlock trees. There are no nearby houses or lawns in this vicinity.

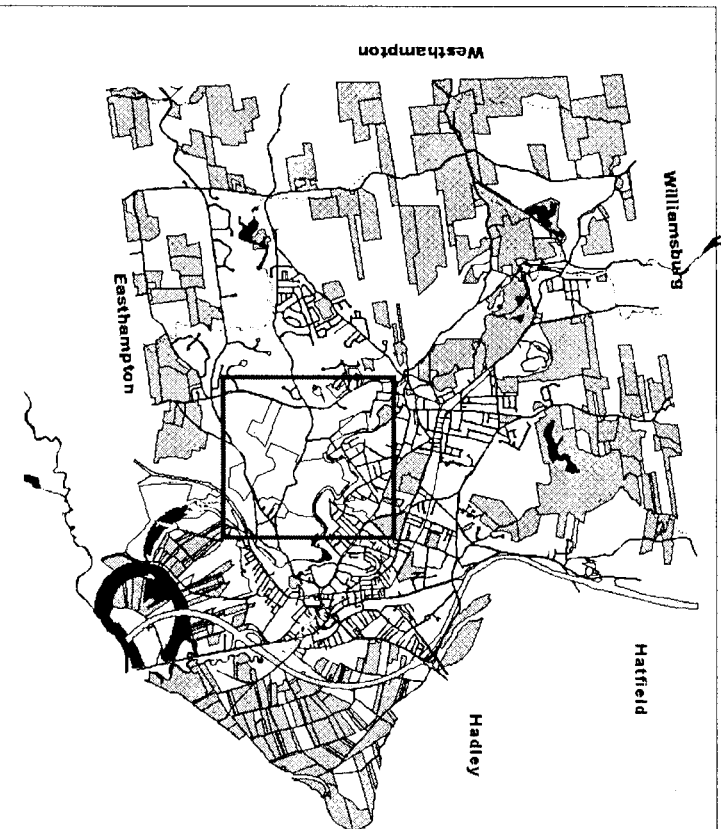
Now the brook empties out into a beaver pond. Surrounded on all sides by steep slopes, this pond looks to be several years in the making, with an active network of beavers adding to it. The pond covers approximately an acre and a half of Parcel 12. There are felled trees all around the pond yielding evidence of beaver intervention. It is here that the brook turns south. In the southwestern corner of the pond, lies a very large beaver dam of about 100-150 feet in length. Another 2 dams and what looks to be the making of a third follow this main dam.

The house on Parcel 13 has a network of paths that lead down past the pond and along the brook. After the dams, the brook then widens to about 10-20 feet across and deepens to 1 or 2 feet. It moves fairly swiftly. Topography in this area is still steeply inclined on either side, but gradually decreases downstream. The houses on the western side of the brook are very close to Parsons Brook. The house on Parcel 14 sits on the edge of the incline overlooking the brook. There are no further obstructions until Parcel 16. There is a bridge made out of telephone poles that connects a network of trails between Parcel 15 and 16.

The soil here becomes visibly sandy and increasingly darker while the vegetation consists of an abundance of White Pine, Eastern Hemlock and Oak. As the terrain

Figure 1. Northampton, Massachusetts Build-out Scenario

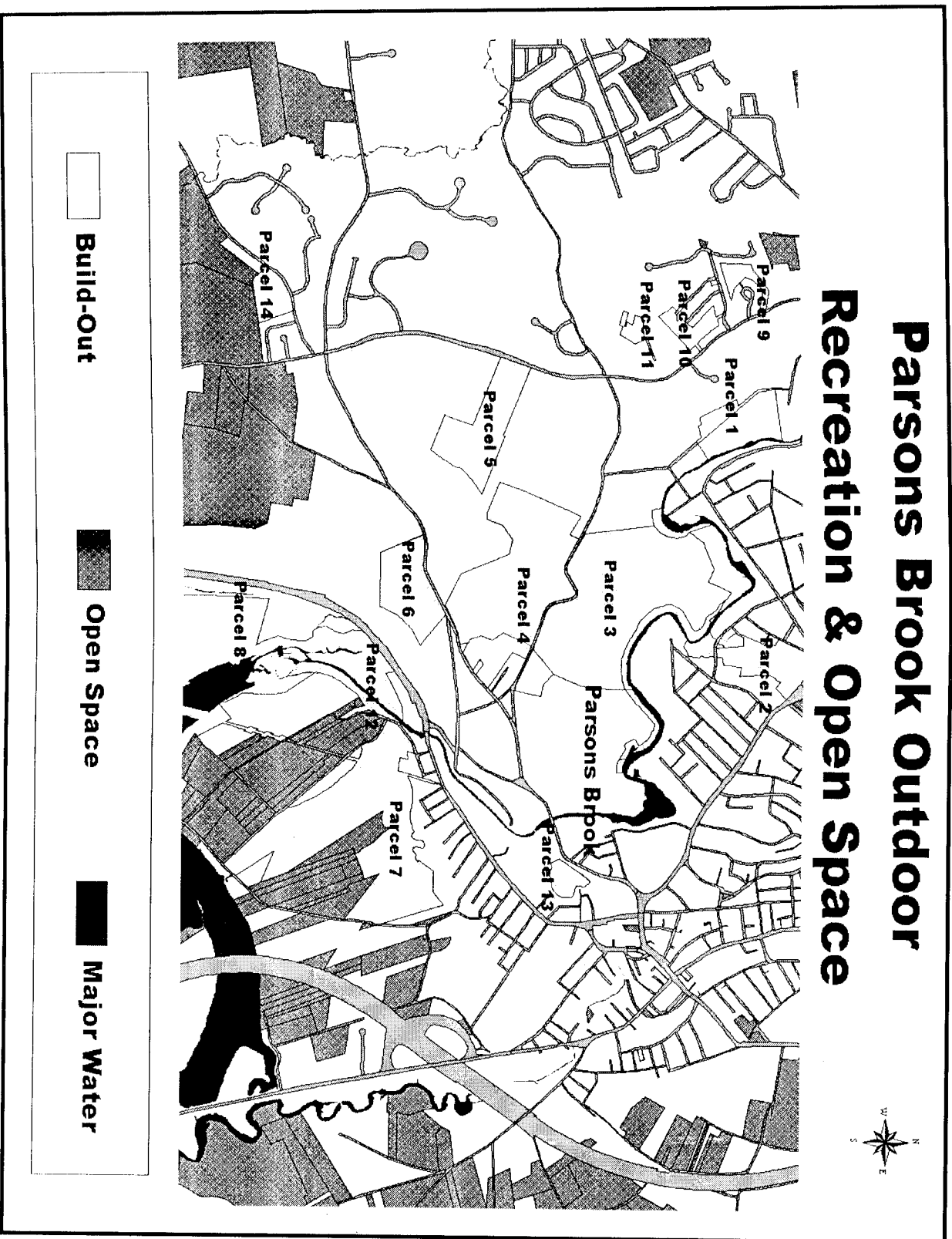
Northampton, Massachusetts Build-Out Scenerio



- Major Water
- Open Space
- Build-Out

This Build-Out represents an illustration of the consequences of a continuation of current growth trends in Northampton, Massachusetts.

Figure 2. Parsons Brook Outdoor Recreation and Open Space Opportunities



which is a poorly drained soil. The survey of the brook ended near the southern edge of Parcel 16.

The ultimate conservation of Parson's Brook in the City of Northampton would provide a small yet important habitat for local wildlife. The brook provides a drinking source for many woodland animals, a habitat various species, and a very aesthetically pleasing area for the surrounding community. Purchasing some of the land buffering the brook may prove to be a worthwhile investment. Some parcels may be easier to come by than others and some owners may not agree to the idea, but an overall effort should be made to protect the brook and to preserve the natural character of the area.

Results

The parcels that may be of some interest to the city are as follows. Parcel 1 contains the area where Parsons Brook originates. The area is wooded and vacant. It would be an excellent area to preserve. The brook crosses Parcels 2 and

3 near the edge of the property and could be considered a priority. Parcels 4, 5 and 6 may be a little more difficult to acquire because there is no direct public access to the property. Secondly, adjoining residential landowners may oppose open-space purchase in their back yard for fear of crime. An easement in this case may be the best option. Parcel number 7 is oddly shaped, and Parsons Brook crosses it in an area that is uninhabited to the viewer. This parcel contains the path used by mountain bikers, and may be of importance for erosion prevention purposes. Parcel 8 is cut in half by the brook, but is also an area where an easement could be procured. The back land on this property is fairly wooded and would be very beneficial in preserving as well. Parsons Brook cuts across Parcel 9 at the very edge, and could be considered a priority spot, whereas parcel 10 is bisected by it and may be harder to obtain. Parcel 11 houses a great length of the brook and is heavily wooded. This spot would be a wonderful piece to preserve, even though it is bisected by the brook and may be met with some difficulty in obtainment. Table 1. illustrates this priority.

Table 1. Priority of open-space land in Northampton

Parcel Number	Priority	Parcel Number	Priority
1	Hi	8	Hi
2	Hi	9	Hi
3	Hi	10	Lo
4	Lo	11	Hi
5	Lo	12	Hi
6	Lo	13	Hi
7	Hi	14	Lo

From this point Parsons Brook enters the gravel pit area and then forms the boundaries between several different parcels. This is a very aesthetically pleasing area and one that should be of high priority. The only area that may be of some concern is along the edge of Parcel 14 because the house on that property is very close to the brook. The rest of the parcels have the brook as a border between them and should be considered a high priority as well.

Discussion

The build-out is a very useful tool for land use planners. GIS, with accurate and complete data, can be used to inventory these resources with the ease and precision of a computer. Alternative scenarios can be created and compared with a click of a mouse button.

The field work part of this project was more extensive than originally thought, but following the old adage "garbage in - garbage out", it is a necessary component in any GIS application. One cannot skimp on data collection. And available data in digital form is often not readily available for municipalities. Data may amount to as much as 75% of the total expense of the project, so one must recognize the importance of complete data collection.

This study may have over emphasized the need for soil data. For example, open space lands are less dependent on

soil type, then would agricultural lands. But it was felt that complete data would be preferred since it is easier to not include something instead of having to build the geographic layers after the fact. It is recommended that future studies in open space planning consider specifically their data needs before conducting the inventory.

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A SPATIAL ANALYSIS OF WILDERNESS CAMPSITES IN LYELL CANYON, YOSEMITE NATIONAL PARK

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Abstract: During the summer of 1999, Yosemite National Park staff collected GPS data to inventory the number and distribution of wilderness campsites in Lyell Canyon, Yosemite National Park. The data were collected after one month of campsite restoration work had been conducted by a student work crew. This study integrated the GPS data with digital raster graphics data for Lyell Canyon to create a wilderness campsite monitoring system tool based on a Geographic Information System (GIS). The monitoring tool developed in this study gives resource managers the ability to identify the number and spatial distribution of campsites in Lyell Canyon that are within and out of compliance with park guidelines for wilderness campsites. The monitoring tool can also be used to record the history of specific campsites from season to season, track changes in visitor use patterns, and identify potential problem areas. Further, this monitoring tool provides managers with insight into the successes and potential failures of management efforts.

Introduction

Yosemite National Park is located in the heart of the Sierra Nevada, in east central California. Yosemite National Park was established in 1890, and is considered to be one of the "crown jewels" of the National Park system. The establishment of Yosemite National Park as the second park in the National Park system (Yellowstone National Park was established in 1872) represents one of the nation's first significant commitments to wilderness preservation (Nash, 1967).

Today, approximately 94 percent of Yosemite National Park's 760,000 acres of land are designated as wilderness under the 1964 Wilderness Act (Yosemite National Park, 1999). The 1964 Wilderness Act mandates the National Park Service to maintain designated wilderness areas in their natural condition "...where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain" (1964 Wilderness Act).

As part of their effort to meet the mandates of the 1964 Wilderness Act, Yosemite National Park officials have developed guidelines for the location of campsites in designated wilderness areas of the park. The guidelines

require that all campsites established in wilderness areas be located 100 feet or further from the nearest water body (i.e., river, stream, lake, pond). In addition, the guidelines require that wilderness area campsites in Yosemite National Park be located 100 feet or further from the nearest trail.

The study area for this research project is Lyell Canyon, located in designated wilderness in eastern Yosemite National Park. Lyell Canyon is formed by the Lyell Fork of the Tuolumne River and runs north to south at an elevation of approximately 9000 feet. Park visitors can access Lyell Canyon by hiking the John Muir Trail from Tuolumne Meadows. The Lyell Canyon section of the John Muir Trail is considered by many to be a highlight of the Pacific Crest Trail, which runs from Mexico to Canada. The canyon is an easy hike from Tuolumne Meadows, and as a result, sees intense use during the summer months.

In an effort to manage the physical and social impacts of intense visitor use, Yosemite National Park operates a trail head permit system. During weekends from June through Labor Day, Lyell Canyon's trailhead is typically at capacity (i.e. all available permits for the area are issued to park visitors). The intense use of Lyell Canyon is accompanied by a high demand for places to camp in the Canyon. The high demand for campsites in Lyell Canyon presents a challenge to park managers who must minimize recreation-related impacts to the resources while providing places for visitors to camp. This study focuses on providing managers with a wilderness campsite monitoring tool that will assist them in meeting this challenge.

Specifically, one of the goals of this study is to provide Yosemite National Park officials with spatial information about the existing campsites located in Lyell Canyon. This information will allow park officials to determine whether the campsites located in Lyell Canyon meet their guidelines for wilderness campsites. Three objectives were identified to achieve this goal:

1. Identify the number and location of existing campsites in Lyell Canyon.
2. Identify the number and location of existing campsites in compliance with wilderness campsite regulations (i.e., distance from water, distance from trails).
3. Identify the number and location of existing campsites not in compliance with wilderness campsite regulations.

During the summer of 1999, Yosemite National Park staff removed approximately 30 campsites from Lyell Canyon. The primary purpose of this management action was to remove campsites that violated the park's guidelines for wilderness campsites (i.e. were located within 100 feet of trail or water). The second goal of this study was to provide Yosemite National Park staff with information to help them assess the effectiveness of management actions taken to meet park guidelines for campsites located in Lyell Canyon. Three objectives were identified to meet this goal:

1. Identify the number and location of campsites removed from Lyell Canyon during the summer of 1999.

2. Identify the number and location of campsites removed from Lyell Canyon during the summer of 1999 that were in compliance with wilderness campsite regulations.
3. Identify the number and location of campsites removed from Lyell Canyon during the summer of 1999 that were not in compliance with wilderness campsite regulations.

Data

During the summer of 1999, Yosemite National Park staff recorded the location of existing and removed campsites in Lyell Canyon, using a Trimble Pro-XR GPS device. Park staff used the software package GPS Pathfinder Office (version 2.10) to correct the GPS data. The resulting output included two vector coverages (existing and removed campsites) represented as point features. The campsite point data were obtained from Yosemite National Park division of Resources Management for this study.

In addition to the vector data coverages of existing and removed campsites in Lyell Canyon, digital raster graphics for the entire park were obtained from the park staff. The digital Vogelsang Peak Quad was used to heads-up digitize the Lyell Fork of the Tuolumne River, smaller tributaries, wetland/lake areas and the John Muir hiking trail. Digitizing output included three vector coverages - a coverage of line features representing streams and rivers in Lyell Canyon; a coverage of polygon features representing wetland/lake areas in Lyell Canyon; and a coverage of line features representing the John Muir trail in Lyell Canyon. The "Clean" command in ARC/INFO was used to build topology for the three digitized vector coverages.

The completed GIS database contains a total of six coverages, each at a scale of 1:24,000. The projection and datum of all six data coverages are Universal Transverse Mercator and NAD 1927, respectively. Five of the coverages are vector data, and the sixth coverage is raster. The vector data coverages are existing campsites, campsites removed during the summer of 1999, rivers and streams, wetland/lake areas, and the John Muir Trail. The raster data coverage is the digital Vogelsang Peak Quad.

Analysis

The spatial analysis operations for this study were performed using ArcView Version 3.1 and ARC/INFO (version 7.2). The analysis was conducted in two stages. First, analysis of existing campsites data was conducted. Second, analysis of campsites removed during the summer of 1999 was conducted.

In the first stage of the analysis, the "Theme on Theme Selection" command was used to identify existing campsites located within 100 feet of any water body (i.e., rivers, streams, lakes, ponds). A second "Theme on Theme Selection" was performed to identify existing campsites located within 100 feet of the John Muir hiking trail.

In the second stage of the analysis the "Theme on Theme Selection" command was used to identify campsites removed during the summer of 1999 that had been located within 100 feet of water. A second "Theme on Theme Selection" was performed to identify campsites removed during the summer of 1999 that had been located within 100 feet of the John Muir hiking trail.

Three dichotomous variables were added to the attribute table for existing campsites and to the attribute table for campsites removed during the summer of 1999. The dichotomous variables were developed based on the results of the theme on theme selections. The first variable indicated whether or not a campsite was located within 100 feet of water, the second indicated whether or not a campsite was located within 100 feet of the nearest trail, and the third indicated whether or not a campsite was either within 100 feet of water, within 100 feet of the nearest trail, or both.

In addition to the theme on theme selections described above, the "Join" command was used to derive the distance from each existing campsite to the nearest river or stream, and to the nearest trail. The distance of existing campsites to the nearest river or stream and to the nearest trail were added to the table of attributes for existing campsites by the "Join" command. This procedure was repeated for the data set of campsites removed during the summer of 1999.

Results

The results of the data analysis suggest that further management actions need to be taken in Lyell Canyon to meet Yosemite National Park's guidelines for the location of wilderness campsites. Analysis of the data indicate that park officials have been relatively effective at locating campsites in Lyell Canyon relative to water bodies - more than three-quarters (77.1%) of existing campsites are greater than 100 feet from the nearest river, stream, lake, or pond (Table 1). However, park managers have been less effective at locating campsites in Lyell Canyon with respect to trails - more than two-thirds (65.7%) of existing campsites are within 100 feet of the John Muir Trail (Table 1).

Table 1. Number and percent of existing campsites in compliance with Yosemite National Park regulations*

	Greater than 100 feet from nearest water		Greater than 100 feet from nearest trail		Full compliance	
	Yes	No	Yes	No	Yes	No
Number of existing campsites	27	8	12	23	11	24
Percent of existing campsites	77.1%	22.9%	34.3%	65.7%	31.5%	68.5%

*Park regulations require that campsites be located at least 100 feet from water bodies and trails.

These findings are reinforced by the fact that the average distance of existing campsites in Lyell Canyon from the nearest river or stream is greater than 100 feet (220 feet), while the average distance of existing campsites from the nearest trail is less than 100 feet (85 feet) (Table 2).

Overall, the spatial analyses indicate that of the thirty-five existing campsites in Lyell Canyon, more than two-thirds (68.5%) are not in compliance with one or both of the park's guidelines for siting wilderness campsites.

Table 2. Distance of existing campsites from nearest trail and water (feet)

	Distance from trail	Distance from water
Mean*	84.5	219.8
Standard Deviation	71.0	99.0
Median	73.9	201.4
Minimum	1.0	74.6
Maximum	285.4	433.0

*n = 35

The management actions taken by Yosemite National Park to remove non-compliant campsites from Lyell Canyon during the summer of 1999 appear to have been effective. More than half (53.3%) of the thirty campsites removed from Lyell Canyon during the summer of 1999 were within 100 feet of the nearest trail (Table 3). A much smaller percentage (26.7%) of the campsites removed from Lyell Canyon during the summer of 1999 were within 100 feet of

the nearest river or stream (Table 3). The most compelling evidence that the park has been successful in their selection of campsites to remove from Lyell Canyon during the summer of 1999 is the fact that nearly three-quarters (70.0%) of the campsites removed were not in compliance with one or both of the park's guidelines for siting wilderness campsites.

Table 3. Number and percent of removed campsites in compliance with Yosemite National Park regulations*

	Greater than 100 feet from nearest water		Greater than 100 feet from nearest trail		Full compliance	
	Yes	No	Yes	No	Yes	No
Number of removed campsites	22	8	14	16	9	21
Percent of removed campsites	73.3%	26.7%	46.7%	53.3%	30.0%	70.0%

*Park regulations require that campsites be located at least 100 feet from water bodies and trails.

Conclusions

The information generated by this study provide Yosemite National Park managers with an important backcountry campsite monitoring tool. Park managers can use the GIS database created in this study to accurately assess the number and spatial distribution of campsites in Lyell Canyon that are not in compliance with Park guidelines. This information can be used by Park managers to prioritize the location of future backcountry campsite management in Lyell Canyon. In addition, the GIS database can be used by park managers to assess their progress toward achieving backcountry campsite management objectives and protecting visitors' wilderness experiences.

The GIS database developed in this study enhances the Resource Management division's institutional memory. This is a significant contribution to Resource Management, given that a large amount of the division's field operations are conducted by a seasonal staff. This monitoring system tool, based on GPS Universal Transverse Mercator (UTM) coordinates, gives resource managers the ability to record the history of specific campsites from season to season in a consistent manner. Having a monitoring system that remains consistent from season to season allows managers to accurately track changes in visitor use patterns, identify potential problem areas, and evaluate the successes and potential failures of restorative efforts.

There are, however, several issues to consider in using a GIS database as part of a backcountry campsite monitoring system. First, wilderness management is not a black and white science. Rather, it is an art of balance. Some campsites identified in a GIS database as non-compliant with park guidelines might be maintained because they are better than the next closest option. Second, the accuracy of the spatial data used to monitor backcountry campsites must be taken into consideration. For example, USGS topographical maps are accurate to plus or minus 40 feet. Therefore, some campsites identified in the results of the data analysis as being in compliance with park guidelines may in fact be out of compliance, and vice versa. Lastly, perhaps the greatest challenge in developing a wilderness campsite GIS database is obtaining reliable and usable

spatial data. The data used in this study are the product of a systematic monitoring effort on the part of the Resources Management Division of Yosemite National Park. However, monitoring efforts in many other park and wilderness areas are constrained from collecting spatial data due to limitations on funding and/or staff. As a result, the data needed to create a wilderness campsite monitoring system based on a GIS database may be difficult to come by in some instances.

The results of our research indicate that Yosemite National Park officials have been successful in their efforts to reduce the number of campsites in Lyell Canyon that are not in compliance with their wilderness campsite guidelines. The GIS database developed in this study can be used to identify and remove non-compliant campsites in Lyell Canyon. Further research should focus on developing similar GIS databases for other wilderness camping areas in the park. By developing additional GIS databases, Yosemite National Park will be better equipped to manage the location of campsites in wilderness areas of the park, and act in accordance with the legal mandates of the 1964 Wilderness Act.

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Management Presentation

INTERPRETATION PROGRAMMING IN THE NYS FOREST PRESERVE CAMPGROUNDS: SUCCESSFUL CONSENSUS BUILDING, PARTNERSHIP, AND REGIONAL MANAGEMENT

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Abstract: The focus of this paper concerns how an established program was modified to better support the mission of the sponsoring agency. As an introduction, the NYS Forest Preserve and the Department of Environmental Conservation's role is discussed. Formal educational programming has taken place in the Forest Preserve campgrounds since the 1930's. The present Interpreter Activity Program is a direct outgrowth of earlier offerings. It is based on an established list of goals set forth in 1996 by DEC campground managers. Formation of a partnership between the Bureau of Recreation and the Bureau of Environmental Education has helped to meet these goals. Program development and administration is guided by a steering committee with a strong emphasis on consensus building. The committee process has worked well and goals have been reached. New initiatives have been developed and attempted. Daily activities are offered using seasonal personnel with on-premise oversight. Regional management of the program allows for consideration of local interests and leads to acceptance of the program goals. Staff members are hired on the regional level and establish strong working relationships with local managers. A blend of both recreational and interpretive programs are offered, leading to a high level of customer satisfaction and accomplishment of program goals. Special offerings such as the Junior Naturalist Program are extremely popular with camping families. Program evaluation is accomplished via surveys, on-site visits, and analysis of reported data. Reasons for success of the program are explored in this paper along with a look to the future.

Introduction

Outdoor recreation programming can be different things to different people. For some it may be macaroni necklace making or a spirited game of staff versus campers volleyball. Still others may prefer a guided walk filled with interesting facts about the natural world. At campgrounds in New York State's Adirondack and Catskill Forest Preserves, the Department of Environmental Conservation has developed a balanced approach to programming. Every year, over 25,000 people with an assortment of interests find something of value from the daily activities offered. The Interpreter Activity Program provides a high quality, organized, recreational, educational, and environmental awareness experience for campers and day users. Eight campgrounds offer formal programming from the end of June to Labor Day. Additional campgrounds offer activities through the *Junior Naturalist Program* and the *Outreach* project.

Outdoor programs have an extensive history of success at DEC campgrounds. In 1996, the Department embarked on the remake of the long standing Interpreter Activity Program, with the goal of creating a program that aligned itself more closely with the mission of the agency. The new offering has been successful, due in large part to the partnership formed between two different bureaus within the Department. This partnership, along with productive consensus building and regional management, have enabled the agency to produce a well-liked nature based program. Campers have fun and at the same time return home with a greater environmental awareness.

Historical Background

As a setting to this subject it is useful to gain a perspective on the Department of Environmental Conservation's role in the administration of recreational activity within the Forest Preserve. The structure of outdoor recreation management varies from state to state. In New York State, it is additionally complicated by the involvement of two separate agencies. The Office of Parks, Recreation and Historic Preservation administer most of the Park Districts in the state. The exceptions are the Adirondack and Catskill Forest Preserves. In these two unique areas the Department of Environmental Conservation administers recreation facilities. To comprehend the reason for this, an understanding of the NYS Forest Preserve is helpful.

Based on concern about destructive logging practices, the NYS Legislature created the Forest Preserves in 1885. The protection of the Adirondacks and Catskills was further strengthened in 1895 with the enactment of Article 14 of the NYS Constitution. The strong Constitutional protection of the state lands within the Adirondacks and Catskills has held up well over the 100 plus years of its existence. Management of the Forest Preserves was passed on from the original Forest Commission to the Forest, Fish and Game Commission to the Conservation Department and finally to the present Department of Environmental Conservation.

Visitors to NYS will find that the character of recreational facilities within the Adirondack and Catskill Forest Preserves is different from that of facilities in the rest of the state. This character of development is in no small way the result of trying "to conserve and protect (the Preserves) natural resources and scenic beauty," as required by Article 14.

History of Interpretation in DEC Campgrounds

The practice of providing interpretive programs at Forest Preserve Campgrounds can be traced back to 1935. The following are excerpts from the 1935, 1936 and 1937 *Conservation Department Annual Report to the Legislature*. 1935 - "Educational Work. In co-operation with the New York State College of Forestry at Syracuse University, the Department last season inaugurated educational work along nature lines at the Fish Creek Pond Campsite. This work is felt to have been very successful, and without exception the campers at Fish Creek were enthusiastic in their support of it. It is hoped that the work

may be extended to other of the larger campsites in 1936. The College of Forestry furnished the services of Mr. Louis Wessel as nature guide, a type of work in which Mr. Wessel had had previous experience at some of the National Parks, and the Conservation Department furnished the facilities for carrying on the work including the construction of nature trails, tent platforms for Mr. Wessel's headquarters and for the nature museum. The latter played an important part in the work as it contained many native specimens identified and labeled by Mr. Wessel.

The Department also constructed a rustic amphitheatre which was used not only by Mr. Wessel for his evening lectures and campfire talks but also frequently by the campers themselves in staging impromptu entertainments. This amphitheatre was named the Alexander Macdonald Amphitheatre in honor of former Conservation Commissioner Alexander Macdonald, a life-long resident of Franklin County in which Fish Creek Ponds Campsite is located, and was dedicated with appropriate ceremonies on August 28th.

	"1935	1936	1937
Number of evening programs....	51	51	43*
Total attendance.....	16,510	25,420	31,402
Largest attendance.....	1,300	1,300	950
Number days museum was open..	58	55	59
Total visitors to museum.....	6,965	7,505	6,990
Miles of nature trails available...	3	3	3
Number of users.....	3,000	3,500	4,100
Number of organized field trips..	9	9	12
Attendance.....	336	440	806"

In the 1960's and early 1970's, a Forest Preserve Interpretive Program was conducted by the Division of Educational Services in cooperation with the Division of Lands & Forests, which operated the DEC campgrounds. Each Interpreter conducted programs at three campgrounds, traveling between them each week. Three staff worked in the Adirondacks; one in the Catskills.

Campgrounds that offered the programs included:

- Fish Creek Pond/Rollins Pond, Meacham Lake, Cranberry Lake
- Roger's Rock, Lake Luzerne, Hearthstone Point
- Moffitt Beach, Northampton Beach, Golden Beach
- North/South Lake, Devil's Tombstone, Woodland Valley

The program ended due to budget cuts in 1976. Throughout this period, campers continued to stage programs at various campgrounds on an informal level. During the late 1970s & early '80s, Paul Smith's College students held occasional programs at the Fish Creek Pond Campground Amphitheater.

Programming - 1982 to 1996. In 1982 a pilot Interpreter Activity Program was started at Fish Creek Pond Campground. From that point the program evolved and grew into offerings at seven locations. Fish Creek Pond/Rollins

Most of the credit for the success of this venture goes to Mr. Wessel who was affectionately known to campers as "Uncle Louie." His unfailing zeal and devotion to the work made failure impossible. A similar amphitheatre was constructed at Hearthstone Point camp site."

In 1936 Mr. Marvin Wilson was the camp naturalist at Fish Creek Pond Campsite. The following excerpt reflects the Department's feelings about the program:

"The two years of experience in this work has clearly demonstrated its value and the desirability of extending it to include campsites in other areas. Probably a total of four additional set-ups such as that at Fish Creek would cover the entire Forest Preserve area in the Adirondacks and Catskills in a satisfactory manner."

The table below from 1937 summarizes the program for the three years it was conducted. There is no reference to this program after 1937.

Pond, Meacham Lake, Moffitt Beach, Cranberry Lake and Nicks Lake in the Adirondacks, Mongaup Pond and North/South Lake in the Catskills.

After the 1996 Season. On October 3, 1996, twenty-two members of the Division of Operations and one representative from the Bureau of Environmental Education met in Lake George, NY to discuss the future direction of the program. At that meeting a partnership was formed between the Bureaus of Recreation and Environmental Education. The later offered assistance with training, recruiting, and campground programming, while the former would maintain administration and management of the program.

Establishing goals, partnerships, building consensus

The October 1996 meeting was facilitated by the DEC's training coordinator. Goals were established, discussion at the meeting involved how to best administer the program. It was decided that a committee would be formed to oversee and develop the program. Committee members were designated from each working circle, Central Office and the Bureau of Environmental Education.

Goals of the Interpreter Activity Program

The goals of this program are to provide educational and recreational opportunities for the enjoyment of campers that:

- Are compatible with the Forest Preserve management.
- Heighten awareness, appreciation, and understanding of the environment.
- Foster proper recreational use of the Forest Preserve and its facilities.
- Promote understanding of the Department and its programs.

In addition to establishing the goals stated here, a list of tasks was created for the Committee to accomplish. Among these were:

- Find job titles that were appropriate to the duties of the staff and paid a competitive wage.
- Establish an internship program that would be manageable and affordable.
- Develop training that help meet the goals of the program.
- Revise of the existing Program Guide.
- Determine the supplies, materials and equipment necessary to conduct activities with an interpretive focus.
- Research and develop a Junior Naturalist Program.

Bureaucrats everywhere would probably agree that a good way to foul up a program and stifle enthusiasm is by forming a committee. Although the committee process is widely used in government organizations, it can be a cumbersome system to use when trying to develop new initiatives. The Department of Environmental Conservation's Interpreter Activity Program breaks that stereotype. Believe it or not, two bureaus from the same agency can work together and produce quality programming for the public.

Establishment of the committee helped ease the partnership formation between the two bureaus. The committee process allowed everyone to come to the table with an equal voice. Each working circle utilizing the program in their campgrounds provided representation. This allowed for a true sense of program ownership which ultimately transferred into success.

Program Management and Application

As illustrated by the tasks listed above, the committee's function is program development and guidance. Two major undertakings have been the creation of appropriate staff training courses and the development of a Junior Naturalist Program. To accomplish these responsibilities, two separate working groups were formed.

1. The **Training Sub-Committee** is made-up of two representatives from each bureau. They plan a four day, preseason training held annually at Paul Smith's College. This consists of field based, hands-on sessions. The location is ideal due to the college's outdoor setting, with the

Adirondack Park Visitors Interpretive Center adjacent to the campus and Fish Creek Pond Campground (DEC's largest) only 16 miles away. Sessions include topics such as Leading Interpretive Walks, Fishing and Conducting Evening Activities.

2. A team to guide the ongoing development of the **Junior Naturalist Program** was formed as the program grew beyond the capabilities of just a couple of people. This team consists of recreation personnel, artists, naturalists and other professionals. Each year a unique workbook (Journal) and a new patch are created. Journal modules and patch designs will be reused on an eight year rotation.

The Committee is now in the fourth year of overseeing the IAP. The first three years were successful, with new concepts and methods continuing to be developed. The partnership between the two Bureaus continues to flourish.

Regional Administration - Each working circle manages the program within their own campgrounds. This includes staff hiring and program monitoring. In this manner, managers maintain local control and ensure quality programming. This has been a key element to success. A program such as this requires support from the ground up. A sense of ownership is critical for the program to function properly. Central program control over large geographical areas like the Adirondacks and Catskills can result in negative impacts. Local management has worked well during the first three years of the Interpreter Activity Program.

Staffing - At each campground the Interpreter Activity Program staff consists of one or two Environmental Education Assistants and one intern.

Basic Qualifications for EEA

Candidates for the position of Environmental Education Assistant must have successfully completed two years of college training in Natural Resources, Natural Sciences, Environmental Education, or a closely related field. Full time work experience in Environmental Education may be substituted on a year for year basis in lieu of formal education.

"Environmental Education" is defined as teaching about or interpreting the natural world, the principles of ecology, natural resources management, and environmental quality management. It deals with the interrelationships of plants, animals, and the non-living environment and emphasizes human interactions with these components.

Experience in the following areas are desirable: outdoor recreation skills and leadership, natural resources interpretation, dealing with people, supervision, writing/word processing, program planning/development, use of audio visual equipment, sports leadership/organization, and group entertainment. Certificates in CPR, First Aid, and Basic Water Safety are recommended. Qualifications for interns are similar, but only one year of college is required.

Recruiting and hiring - what has worked, what hasn't.

Environmental Education Assistants - The majority of the EEA positions are filled annually by returning candidates or by previous program interns. At a pay rate of \$10.34 per hour plus housing there has been little difficulty filling these positions with highly qualified persons.

Interns - In the first year of the revised program only three interns were recruited. At that time compensation consisted of \$75 per week food allowance plus housing. Alternatives had been investigated, such as using Empire State College or the Student Conservation Association. These and other recruiting services would have cost approximately \$2,500 per intern with the candidate still only receiving about \$50 to \$75 weekly. Given the cost of these options, it was decided in the second year that interns would be paid a wage of \$210 per week plus housing. For a ten week season, interns would then earn \$2,100. Over 30 students applied that year, nearly 60 applications were received the following season. Academic integrity of the internship is maintained by assigning academic coordination to the Chief of the Bureau of Environmental Education, since that bureau has worked with numerous interns over the years.

The Summer Season - The Interpreter Activity Program is designed to enhance the campground experience. The program's interpretive goals are to make campground users more aware of the Forest Preserve setting in which they are camping, to raise their appreciation and understanding of the many elements that make up the Preserves, and to encourage attitudes of stewardship toward these public resources. Activities are conducted in a recreational setting and are designed to be enjoyable, recreational and educational. The program's purpose is to provoke an interest in learning more about the natural resources of the Forest Preserves. Offerings are varied and balanced, consistent with the purpose of the DEC. The program does not attempt to organize activities for the camper's entire stay. The aim is to enrich their Forest Preserve experience and perhaps be a highlight of their vacation.

Two to four activities are offered daily at each of the eight campgrounds. While nature based programming is the emphasis, some activities of a more general recreation character and pure entertainment are also offered. A balanced approach is critical. At Fish Creek Pond Campground, staff have found that some interpretation can be worked into most programs, but around 40% of activities need to be just plain enjoyment. Volleyball would most likely fall into this category and is always a popular event.

Three Special Programs and Offerings

3. **The Junior Naturalist Program** has become extremely popular with our customers. In the three years it has been offered, a total of 7,509 journals were distributed with 4,775 children completing the journal and receiving a Junior Naturalist patch. Program participation and completion increased by 126% in the second year and another 25% in the third year. In addition to the seven IAP campgrounds, seven other facilities offered the program. These are referred to as

JNP Satellite Facilities. This use of the JNP at Satellite sites has enabled us to reach many children that would otherwise not receive the benefit of the program.

Returning camping families now look forward to this program. They anticipate new journal activities and new patch designs. The Junior Naturalist Program is a great tool for exposing children to the natural world. In addition, it achieves an outstanding level of customer satisfaction. The formation of an inter-bureau team to produce new materials on an annual basis has worked well. There is a continual improvement in the quality of the journals and patches. The IAP Committee has made specific recommendations to the team regarding the need to present new modules every year. With our base of returning customers, it is necessary to keep the program fresh.

The 2000 patch features the Sugar Maple, thus portraying a NYS symbol for the third time. Future designs will continue to feature New York State symbols such as the Lady Bug and Brook Trout.

Due to the high quality of the JNP, other agencies and groups have requested use of the program. A group of State Parks (OPRHP) in the Thousand Islands Region used the first JNP journal as a model to develop their own program and materials. Their final product utilized the strengths of our program, but was customized to be more appropriate to their local area. This past summer, the *Conservationist* featured a full color pullout section of the Bluebird module from the 1999 journal. Both of these uses of the JNP materials have been good methods to better utilize the work put into development of the program. This has also resulted in a larger number of citizens benefitting from the program. These outgrowths are a genuine example of the value of the JNP. To foster a continuation of this type of material use, specific guidelines have been recommended by the committee and approved by Central Office. These guidelines will preserve the integrity of the JNP as it is offered at the campground level, while at the same time allowing materials to be shared with others.

4. **Adventure Discovery Packs** - A day pack containing family activity suggestions, small field equipment and field guides is available at each campground. Campers can sign these out on a daily basis. Although actual use was low, the packs were enjoyed by the campers who used them. Despite low utilization of the packs, this opportunity will continue to be offered, as it is an excellent method for families to interact with nature. Little staff time is required to make the packs available.

5. **Outreach** - For a second year, existing IAP staff traveled to nearby campgrounds to conduct activities. There were six campgrounds that received the benefit of the *Outreach* project; 664 campers attended a total of 63 activities presented on 28 program days. This is a good method to expose more of our customers to the natural environment without the cost of a full scale set-up. The *Outreach* project will continue much as it has for the last two seasons. Additional interns at selected IAP sites would allow for

Outreach activities at an increased number of campgrounds. This method of expansion may be considered if additional growth is desired in the future. Concerns with the *Outreach* project are transportation difficulties and reduction of staff time at the main campgrounds.

Program Evaluation, Expansion, and Change

Every camping party at each campground receives a Camper Comment Card to rate their stay. Included on the cards are remarks about the IAP. The following are excerpts:

- **From Mongaup Pond:** "Jill, the recreation coordinator, was great! Very helpful and friendly."
- **From Fish Creek Pond:** "Recreation staff was great. Canoe guide was excellent - kids had fun."
- **From Moffitt Beach:** "Excellent program! We feel that Dan Connor did a great job with the recreation program." "I really liked the rec. program, it was excellent!"
- **From Cranberry Lake:** "We really enjoyed your DEC Recreation Program - very informative." "Our daughter received her Jr. Conservation Patch (JNP), and it made her day!"

The program undergoes continual internal review. Seasonal staff members are given the opportunity to evaluate training sessions and near the end of the program season they are requested to complete a comprehensive year end evaluation. Regional managers observe activities and meet with staff at the campgrounds on a regular basis. Their observations are collectively reviewed each Fall. Throughout the off-season, the IAP Committee meets to plan for the next summer.

Improvements and changes have been made regularly throughout the last four years. The most notable expansion of service to the public has been through the *Outreach* project and use of the Junior Naturalist Program at satellite facilities. During the 2000 season the IAP will be expanded to include Luzern Campground in the southeastern Adirondacks.

In December of 1999 the entire staff from both the Bureau of Recreation and the Bureau of Environmental Education met for a brainstorming session on how to broaden the partnership which has been established. A number of ideas surfaced which may prove to be of mutual benefit.

Summary

In a world of advancing technology, it will be important for this program to stay current. At this point, equipment for program presentations is being upgraded. With the strong bond formed between seasonal staff members, electronic communications are being enhanced so that program experience and knowledge can be easily shared. As with most things, technical changes will probably have an effect on this program. The challenge will be to adjust to this change, while at the same time maintaining an outdoor, nature based program, not letting technology detract from hands-on learning.

After three camping seasons, the IAP has effectively made the transition from a mostly recreation/entertainment program to a more balanced format. The recreation base has been maintained, while at the same time the percentage of interpretive activities has increased. The interpretive portion of the program blends elements of recreation/entertainment into the environmental education experience. This blend of activities has enabled the program to meet the goals and objectives set forth in October 1996.

Comments from our customers illustrate the positive affect of the IAP. The Department is proud of the success that has been achieved by the program. The ground work that has been established will carry over for many years to come. By working to achieve the goals of the program, the Bureau of Recreation and the Bureau of Environmental Education will continue to contribute to the Mission of the DEC.

The Interpreter Activity Program continues to expand its range of influence to an increasing number of Forest Preserve users. By giving the public an increased sense of the natural world, the program fosters a commitment to the Forest Preserve and other outdoor areas.

NOTES

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1. 1969 Amendment to Article XIV of the New York State Constitution
 2. New York State Conservation Department Annual Report to the Legislature 1935, 1936, 1937

DON'T BE THRU-HIKING; START UHIKINGSM

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Abstract: Our National Scenic Trails help to protect wilderness and rural culture, while at the same time providing benefits to outdoor recreationists. Thru-hiking is an outdoor recreational pursuit that involves hiking "through" the entire length of a National Scenic Trail. A support network exists for hopeful sojourners desiring to thru-hike that captivates their interest, offers incentives, establishes a fraternity, and assists in the planning and implementation of a thru-hike. This has led to thousands of hikers congregating at the same end of a National Scenic Trail at around the same time, out of which only a few complete the journey. The majority of these sojourners drop out, but until they do both natural and cultural resources suffer from overuse and abuse. We need an alternative to thru-hiking which will promote local greenways and trails as a training ground prior to utilizing National Scenic Trails. T.R.A.I.L., Inc. promotes the concept of UHikingSM as an alternative to thru-hiking. UHikingSM would help take the pressure off National Scenic Trails, promote stewardship through increased user interaction with local greenways and trails, and provide a wilderness journey designed to particularly meet the needs of the sojourner. We call for the establishment of a support network for UHikingSM with much of the same elements of a thru-hiking support network.

Our National Scenic Trails are considered part of our natural crown jewels under the jurisdiction of the National Park Service. A National Scenic Trail generally traverses many states over a long distance. Where these trails go through some National Parks such as Yosemite (Pacific Crest Trail), Yellowstone (Continental Divide Trail), or Shenandoah (Appalachian Trail) they receive millions of visitors yearly, mostly as dayhikers. But the long distances these trails cover invite long distance hikers as well. Thru-hiking refers to the outdoor recreational pursuit of hiking "through" the entire length of a National Scenic Trail. Though thru-hiking accounts for only a small percentage of the trail use for any season in most areas along a National Scenic Trail, it accounts for a high percentage at the ends of National Scenic Trails at certain times.

The actual and potential congestion of thru-hikers at the ends of National Scenic Trails creates a natural resource management problem. Regulatory approaches such as user fees, or limiting the number of thru-hikers who can begin their journey each day, have been proposed as solutions. We introduce a new concept for wilderness recreation, UHikingSM, as an alternative to regulation that combines incentives and education as a solution. UHikingSM promotes the benefits for which National Scenic Trails were designed, enhances the benefits obtained from wilderness

journeys, and suggests a new paradigm for land stewardship.

National Scenic Trail Benefits

Benton MacKaye was a forester and regional planner whose vision gave rise to the Appalachian Trail, the first officially recognized National Scenic Trail. MacKaye noticed that development in the eastern United States followed transportation corridors. In his book, The New Exploration, he referred to this development as a metropolitan invasion, and noted that the Appalachian highlands acted as a barrier to normal transportation routes and, hence, a barrier to the invasion. The purpose of our first recognized National Scenic Trail, in MacKaye's view, was to help preserve this existing barrier that could "dam the urban tide."

MacKaye suggested three benefits that would result from instituting a long-distance trail along the length of the Appalachian highlands. These are:

- protection of natural resources;
- protection of cultural resources; and
- opportunities for outdoor recreation.

The first two benefits, the protection of both wilderness and a rural culture, are indigenous to the Appalachian Trail corridor. However, continuing with a plant species metaphor, the third benefit can be considered exotic. As MacKaye prophesied in his vision, the bulk of outdoor recreationists come from the metropolitan areas outside the trail corridor, seeking those indigenous benefits no longer available to them in their own environment. These people are exotics in the sense of being outsiders "invading" the corridor to reap their benefits. Just as with plant exotics, the invasions of outdoor recreationists present a threat to the indigenous resources. Large numbers of people, even as visitors, degrade both wilderness and rural environments. As the recognition of our National Scenic Trails has increased larger numbers of outdoor recreationists have visited them in quest of a wilderness journey.

Wilderness Journey Benefits

A variety of goals lead outdoor recreationists to attempt a long-distance wilderness journey. Many seek to meet a challenge, such as completing the entire distance of a National Scenic Trail. Intangible goals, such as self-discovery, motivate many as well. Some want an adventure, without specific concern as to the journey's end. Also less concerned about the journey's end are those who seek an alternative lifestyle, to simply get away from the "rat race."

Any of these goals can be achieved through more convenient means. There are other ways to tackle arduous challenges without leaving your job. One does not have to acquire a disgusting look and smell, soaked with dirt-caked sweat and little opportunity for bathing, while on a path towards self-discovery. Adventure can be found without doing the same repetitious act of putting one foot in front of

the other, day after day after day, for great many hours each day. One can get away from the "rat race" without requiring a 5000-calorie per day diet.

These are not trivial drawbacks, as evidenced when nine out of ten people who attempt a thru-hike on the Appalachian Trail drop out, most during the first few weeks. Why do so many make the attempt in the first place? The answer lies in the support network established by trail organizations that promote long-distance journeys.

The Thru-Hiker Support Network

Many thru-hikes of the Appalachian Trail have been published. While these accounts may not be as gripping as Shackleton's Antarctica Expedition or Krakauer's climb of Everest, for a similar reason they provide the hopeful sojourner a more probable avenue to pursue a dream. After doing a little research, these hopeful sojourners find that logs are kept and patches given out in recognition of thru-hikes. Directories of hiking organizations are kept with the identifiers of which trail a member has thru-hiked. The hopeful sojourner discovers that he/she embarks not only upon a new adventure, but a new fraternity.

The hopeful sojourner proceeds to obtain planning materials that have been tailored specifically to the needs of a thru-hiker. Trail guides focus only on a particular section of National Scenic Trail, such as the Maine section of the Appalachian Trail. Companion guides provide details for all the services—showers, supplies, even handouts of free food—which can be found along the journey. Data guides provide mileages for the whole trip in one single, lightweight pamphlet.

The hopeful sojourner finally embarks upon the thru-hike and, in the case of the Appalachian Trail, soon finds a trail elaborately blazed—so that even the guidebook or data guide is unnecessary—while shelters exist at frequent intervals. With such a support network encouraging a specific endeavor no wonder thousands of people begin a thru-hike, and no wonder thousands drop out after having unrealistic expectations. Yet before thousands drop out of an Appalachian Trail thru-hike, places such as Springer Mountain, Georgia feel the full brunt of both their numbers and inexperience.

Problems Caused by Thru-Hiking

Something as long as the Appalachian Trail requires more than one season to hike. This suggests an optimum timeframe for completing a thru-hike, one that helps the thru-hiker avoid areas that receive much snowfall during the cold seasons. On the Appalachian Trail thousands of hopeful sojourners converge upon Springer Mountain to begin their thru-hikes in the months of March and April, late enough to avoid heavy snow in the Smoky Mountains yet early enough to avoid snow in the northernmost states. Appalachian Trail lands a few hundred miles north of Springer Mountain suffer from this congestion of thru-hikers. Trash, bootleg campsites, human wastes, and eroded trail are among the litany of natural resource abuses

caused by too many people in the same area at the same time.

Abuses to cultural resources result as well. Some thru-hikers have acted as if the services listed in their companion guides are an entitlement, rather than a gesture of good will offered by locals. The Appalachian Long-Distance Hikers Association (ALDHA) has initiated an Endangered Services Campaign to offset the services now being withdrawn by indigenous people fed up with the antics of thru-hikers rudely taking their services for granted.

Ironically, a problem of neglect also results from the emphasis upon thru-hiking. As more attention and resources become focused upon National Scenic Trails, less becomes available for local greenways and trails. Yet these are the areas most in need of our attention. The health of our environment depends not upon how we treat isolated pockets of preserved wilderness, but how we all learn to care for our own backyards everywhere. While MacKaye had a good idea in conceiving his "dam" to the urban tide, we should not abandon our consideration for the natural resources within metropolitan areas.

Trail organizations are aware of the problems being caused by too many thru-hikers. They also are aware that long-distance journeys provide life-changing experiences for people, who then contribute to the future support and protection of a National Scenic Trail. Thus, the support network for thru-hiking continues. These combined consequences of overuse and protection created a Catch-22 situation that led National Park Service managers toward regulation as a solution. During the spring of 1999 they limited the daily numbers of thru-hikers who could begin their hike from Springer Mountain. Regulation is nobody's favorite means of resolving a conflict. More preferable would be an alternative outdoor recreational pursuit that utilized National Scenic Trails for life-changing experiences, yet avoided the overuse that results from congregating thousands of hopeful sojourners.

Stewardship and Manners

Another argument offered in support of promoting National Scenic Trails and other areas of fine wilderness is that these beautiful places will inspire us to become better stewards of the land. In theory, local trails and greenways benefit as well by the promotion of thru-hiking and National Scenic Trails because the stewardship principles learned by awe-inspired users will be later transferred to these local areas. This premise has a serious flaw, the illogical assumption that becoming good stewards best occurs away from home.

Land stewardship has much in common with good manners. Courtesy and respect provides the foundation for both, and both seek to avoid the negative impacts of being greedy and messy. If we want to provide an experience for outdoor recreationists that encourages stewardship, we can learn much from what we know about good manners.

Most of us do not bring our kids to fine public places with the intent of teaching them good manners. While the atmosphere of a quality restaurant may be conducive towards applying manners, such manners are better learned at home first for two reasons. One, the negative impacts of failing to apply manners at home affect fewer people. Two, the benefits of applying good manners at home provide more direct positive reinforcement to the learner. You can leave your mess behind at the restaurant; you have to live with the mess you create at home.

For similar reasons, National Scenic Trails should not be considered appropriate for indoctrinating stewardship values. Local greenways and trails are better venues for learning stewardship values because the consequences of failure are more dispersed, which decreases the impact in terms of extent and who is affected. The use of local greenways and trails as stewardship training grounds also provides more direct feedback for outdoor recreationists. You can leave your mess behind on a National Scenic Trail for National Park Service employees or regional volunteers to clean up. You have to live with the mess you create on a local trail, or you are more likely to be personally acquainted with the local volunteer responsible for cleaning up after you.

Thus, if we seek an alternative to thru-hiking that still promotes National Scenic Trails, we would be well served if such an alternative promotes local greenways and trails as well, especially as the training ground to acquire stewardship values in prelude to reaching the National Scenic Trail.

The Uhikingsm Alternative

T.R.A.I.L., Inc., as an educational nonprofit organization committed both to providing quality wilderness journeys and protecting the quality of wilderness, proposes Uhikingsm as the alternative needed to address the problems with thru-hiking.

The U in Uhikingsm is a figurative representation of a Uhiker's journey. A section of National Scenic Trail provides the backbone for the U, while local or regional greenways and trails are utilized as approach and departure routes, forming the arms of the U. The U also signifies that YOU, the sojourner, designs a unique journey.

For example, T.R.A.I.L., Inc. will embark upon our first official Uhikesm this summer. Disadvantaged youth and adult mentors will form a community of wilderness sojourners that will canoe the Connecticut River from near the Canadian border down to Hanover, NH. There we will hook up with the Appalachian Trail, the backbone of our Uhikesm, and backpack from Hanover down to Kent, CT. From Kent we will complete our journey by canoeing down the Housatonic River to Long Island Sound. Our journey will help promote the Housatonic Riverbelt Greenway efforts currently underway.

Our Uhikingsm concept addresses several issues. It challenges the notion that National Scenic Trails are

suitable training grounds for stewardship, and alternatively promotes local or regional greenways and trails as the place for hopeful sojourners to learn both the skill and the ethics requisite to their endeavor.

A Uhikesm can be tailored to benefit the particular interests of the sojourner. Springer Mountain, a rather nondescript place, has little significance outside of being officially designated as one end of the Appalachian Trail. One can imagine hundreds of places that could serve as a more meaningful beginning or end to a long distance hike. The Uhikesm can accommodate multiple recreational pursuits, such as a combined canoe and backpack journey. The Uhikesm can be just as long as the sojourner needs. Maybe a journey of 2000 miles is too long, or not long enough.

Yet we chiefly promote Uhikingsm in the spirit of MacKaye's vision for what a National Scenic Trail can provide for society. Uhikingsm would allow the "exotic" outdoor recreationists to "invade" the National Scenic Trail corridor without threatening the preservation of indigenous natural and cultural resource benefits.

One single Uhikesm, of course, does not remedy the problems caused by thru-hiking. Uhikingsm requires a support network as well, to attract sufficient numbers of outdoor recreationists that will alleviate the impacts of thru-hiking.

The Uhikingsm Support Network

Upon the return from our first official Uhikesm, T.R.A.I.L., Inc. will use the journey to help initiate our Uhikingsm support network. We will use trail, wilderness, and/or recreation conferences as forums for promoting the concept, as well as devoting our web site to that cause. T.R.A.I.L. will offer Uhikingsm patches based upon mileage (e.g., a 500-mile or a 2,000 mile patch) and keep official logs of Uhikers and Uhikessm. In the future we will feature a "Uhike of the Year" out of those journeys brought to our attention, and arrange for the journey's account to be published. T.R.A.I.L. will facilitate a Uhiker's Conference, when enough Uhikers exist to make such an event rewarding.

But T.R.A.I.L., Inc. can not act alone in our efforts to promote Uhikingsm. We can work with existing trail organizations, such as the Appalachian Trail Conference, to set up Uhike logs of their own, to further promote the Uhikingsm concept, and to eventually downplay thru-hiking. We will work with the affiliated municipal or nonprofit agencies to draw attention to their greenways and trails used for the purpose of Uhikingsm.

A successful support network will need to go beyond such efforts even further. Trail guides with a specific National Scenic Trail as a theme need to be replaced by guides with a region of trails as the focus. Some of the volunteer labor that goes into constructing shelters with frequency along a National Scenic Trail should be diverted to the local or regional trails, with the effect of making the local trails more attractive, particularly to hopeful sojourners.

Fortunately, only the Appalachian Trail now attracts thousands of thru-hikers to a particular place and time. But the numbers of thru-hikers are increasing for other trails as well. Constructing a Uhikingsm support network will take

time. Now is the time to start, with the intent that in a few years the flood of thru-hikers can be significantly diminished in some places, and effectively prevented in others.

USING TECHNOLOGY TO DEVELOP CONNECTIONS BETWEEN INDIVIDUALS, NATURAL RESOURCES, AND RECREATION

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Abstract: Information technology is here. How we as natural resource providers, researchers and users decide to use it responsibly is up to us. This study presents the facts of information technology and how to use this technology to develop connections between individuals, natural resources, and recreation. Three categories that were explored are (a) an overview of information technology and recreation and tourism, (b) National Park Service interpretation programs, and (c) computer-based learning and education programs.

Introduction

Most Americans cannot imagine their lives without some form of technological interaction. Communication, education, and research have been advanced through technology. But how can technology fit with America's cultural, historic, and natural resource heritage? This question is explored in the following three categories: an overview of information technology and recreation and tourism, National Park Service interpretation programs, and computer-based learning and education programs.

Most National Parks provide an on-line tour for potential visitors. Therefore, some interpretation of the parks is done before they reach the site. However, it is important to distinguish between simply providing information versus interpretation on the web. Visitors to National Park Services are expecting an educational, exciting and stimulating experience. Interpretation has traditionally accomplished this through a talk given by a naturalist or ranger, displays of photos and artifacts created on-site or through slide shows, among other methods. However, technology has changed the way interpretation is presented. The example provided will be using research technology during interpretive programs at Isle Royale National Park.

The computer-based training program is used as a major tool for educational programs and distance learning. Nature centers, gardens, and parks are increasingly using

computer based programs to teach youth about the natural environment. However, how can one combine technologies with the natural environment so that youth learn the difference between the out of doors and what is portrayed on a computer screen? An example is provided from the Michigan 4H Children's Garden.

An overview of IT

Information technology (IT) is a broad subject of managing and processing information. The first section of this paper is to provide an overview of information technology and its applications in the field of recreation and tourism. Because IT changes so rapidly, new applications are available everyday. The example provided today maybe obsolete tomorrow. Managers of recreation and tourism should update their knowledge of IT and be informed of the latest applications.

Facts of IT

To realize what IT is and what IT can do for us, it is helpful to see what are the impacts of rapid creation and adoption of IT on the global market. Information technology has been a buzz term for the past decade and is one of the most important components of management systems. The following facts are provided to illustrate how IT has become part of our life in a very short period of time.

- Between 1995 and 1998, IT accounted for about 8% of U.S. GDP and contributed on average 35% of the nation's real economic growth (US Department of Commerce, 1999).
- 56% of U.S. companies will sell their products online by 2000 (NUA Internet survey, 1999).
- 50% of the U. S. workforce will be employed by industries that are either major producers or intensive users of information technology products and services by 2006 (NUA Internet survey, 1999).
- 16.5 million U.S. adults have used the Internet or an online service to make travel reservations in 1999. This is up 146% from the 6.7 million adults in 1998 (Travel Industry Association, 2000).
- Revenues of on-line travel doubling each year, expected to hit \$16 billions by 2003 (Jupiter Communications, 1999).

There were only 3 million people connected to the Internet and were only 26,000 domain names in use worldwide in 1993. However, 80 million Americans were connected and approximately 200 million people worldwide in 1999. Currently, there are 5 million web sites and more than 800 million pages on the web (US Department of Commerce, 2000). All of these facts about IT point to one fact- like it or not, IT has become one of the most important forces in the market. Being a manager in the field of recreation and tourism, the question becomes not whether, but how to adapt IT as a management tool for your agency.

Information Technology

Information Technology involves an array of modern tools that support information communication and data management. These tools include computer hardware, software, network, video and audio devices,

telecommunications, satellite conferencing, and other media. The definition of IT, according to ZDNET, is "...refers to the broad subject of managing and processing information, especially within a large organization or company. Because computers are central to information management, computer departments within companies and universities are often called IT departments. Some companies refer to this department as IS (Information Services) or MIS (Management Information Services)." (ZDNET, 2000). In short, we can say that IT is any technology that allows for the creation, management, and communication of information (Bryan and Young, 1999). In general, IT consists of four components that function as an integrated data management tool:

- Data Collection (Input)
- Data Management
- Data Processing & Analysis
- Presentation (Output)

None of these components are new inventions to the world. However, IT brings new concepts to these approaches and advances the whole process. The inventions of computer and the applications of the Internet have significantly reduced the time and cost of data collection. The Computer-Assisted Telephone Interview (CATI), for instance, has been used by many recreation and tourism agencies to collect user information. Survey through the Internet and E-mail is another example of how IT can help collecting data more efficiently.

Database management is probably one of the most important components for any recreation and tourism management. Tremendous amounts of data are regularly updated and maintained for three elements in recreation and tourism- users, programs, and facilities. The computer has replaced pencils and index cards in managing database in terms of tracking customer preferences, facilities and programs usage, updates and maintenance. Take the reservation system as an example. All the information can be saved and maintained in a central location for easier retrieval and update. By using the internet and/or intranet communication, a gate keeper of a campground in a remote area can update their inventory on her computer in real time. All the reservation information can get updated no matter if the campers call the toll free number and make reservations or just show up and make the reservation at the gate.

IT also makes data processing and analysis easier than it used to be. Today any desktop computer can perform sophisticated tasks that only mainframe could do ten years ago. Some of the most popular applications include Spreadsheets (Excel), database (Access), and statistical packages (SPSS, SAS, Systat, etc.). These programs help managers to analyze data more efficient and effective than ever.

The presentation has been better and easier because of IT. All these word processing applications have helped in preparing, editing and formatting documents. The use of PowerPoint for business presentation provides both visual and sound effects. With web pages and portable document

format files, the output can virtually target as many audiences as desired.

IT and Recreation and Tourism

In general, IT increases productivity and efficiency, changes the way we do business, helps make better decisions, and makes the "global village" possible. The following two examples illustrate how IT has been utilized in the field of parks and recreation.

National Park Service- Natural Resources Interpretation

When Americans think of their National Parks, an image of the Park Ranger is one that often comes to mind. For many visitors, the Ranger campfire program was and still is one of the main sources of information and interpretation of the Park unit that they are visiting. It can be said that Ranger interpretation remains the most public and identifiable component of the National Park Service (NPS). For the purpose of this paper, interpretation can be defined as a method for "people (to) communicate the significance of cultural and natural resources" (Knudson et al., 1999, p. 4). Traditionally, National Park interpretation has been performed by naturalists or Park Rangers referred to as interpreters. These interpreters provide programs, exhibits, and educational opportunities for the public (Mackintosh, 1986).

The Isle Royale project suggests a different educational and interpretive approach within the NPS because it involves natural resource researchers presenting the results of their research directly to the public rather than presentations by NPS interpreters. For many years, researchers in cultural resources have presented their findings directly to the public in many settings, but public presentations are more unusual for the natural resources researcher. This project is referred to as a "new-old approach" in recognition of interpretation done by researchers in other fields. For example, interpretation has been done by cultural researchers in Michigan at Fort Michilmackinac for forty years (DNR, interview 1999). There are park units that have a few presentations by researchers during a season, but none to my knowledge are attempting the numbers of programs that the Isle Royale project has already successfully accomplished. There are also a small number of NPS units that are starting to suggest an incorporation of researchers into their interpretive programs (NPS, 1999).

Isle Royale was authorized as a National Park in 1931 as one of the nation's first nature parks rather than a scenic park (Runte, 1997). Isle Royale National Park is an archipelago of 400 islands, located within the northwest corner of Lake Superior. The islands, which include the largest island in Lake Superior, vary in size from over 40 miles in length to only a few square feet (NPS, 1995). In addition to the islands, the National Park Service manages the surface of Lake Superior four and one-half miles out from the shoreline. This results in approximately 80% of the Park consisting of water (Isle Royale National Park Pamphlet, 1996). The total area of the Park is approximately 571,790 acres of which approximately

133,782 acres are land. (National Park Service, 1995). In 1976, 98% of the land area of the Park was designated as Wilderness by the federal government; this percent has since been increased to 99% (NPS, 1995). Today, Isle Royale National Park remains one of the largest federally designated wilderness areas in the Midwest. In 1980, the United Nations declared the Park an International Biosphere (DuFresne 1991). This designation is one indicator of the importance of the natural resources in this Park for the world. Isle Royale National Park is one of the least visited Parks in the National Park system, due in part to the difficulty in traveling to it. The total number of annual visitors is less than 20,000 (Isle Royale Report, 1999).

This project involves the presentation of a new format of interpretive programs on board the ship Ranger III as it crosses Lake Superior with Isle Royale National Park visitors. Ranger III is a 165-foot ship operated by the National Park Service and carries up to 125 passengers per six hour trip. This ship makes approximately 64 round trips from Michigan to Isle Royale National Park per season. Park Interpretive Programs traditionally have been offered to the visitors by a Ranger to prepare them for their visit to this wilderness National Park. These Ranger programs have presented topics such as rules/regulations of the Park, safety, and low impact camping. Since 1996, programs have been expanded to include presentations by researchers discussing the results of their research at Isle Royale. The topics of those presentations have included wolf-moose balance, climate change and loon research. The impact of these presentations by researchers on visitors' knowledge and attitudes has not yet been studied. During the summer of 1999, researchers used a large screen television and a computer to display their research directly to the public as part of their interpretive presentations. These presentations incorporating technology through the use of computers (PowerPoint) and being able to display research as it is generated is unusual in the field of interpretation. Researchers onboard the Ranger III present their data directly to the public as soon as they receive it. For example, Lake Superior water study data is collected from the Ranger III using probes. These probes are dropped into the lake and transmit their data directly to the researchers onboard who then display it to the public.

I believe this project will be of interest and benefit to at least three groups. First, the National Park Service will be able to better understand the public's ability to learn from interpretive programs and therefore be able to add to the present formats of programs being presented. The second group that could benefit are the researchers and their related institutions. They will have a better understanding of useful approaches to the public in presenting their research. Finally, the public may develop a greater understanding of and interest in the research that is occurring in the National Parks. Through that understanding, there may be a change in behaviors that adversely affect the Parks and their resources. Additionally, the public may become more supportive of the financial needs of the Park Service. A visitor to Isle Royale National Park wrote the following to the Park Superintendent, "I

believe the National Parks were created under the same guidelines as the Constitution. They were created by the people for the people. If the people do not feel welcome, they will cease to come. If they cease to come, they will cease to bring their children. These children will be the ones who will inherit Isle Royale. If they do not know her, when the time comes for funding cuts, they will not hesitate killing something they do not know" (Personal letter, 1998).

One side benefit of this research project is that it is not limited to a narrow field of interest but rather it could appeal to anyone who wants their research better understood by the public. Additionally, researchers may find it beneficial to meet with other researchers as a result of these presentations. Finally, the public may be the biggest beneficiary of this project. Last summer after participating in one of the "real time" programs, an individual exclaimed that it was the first time he had been treated like an adult in a National Park interpretive program in several years. He concluded by saying that unless you are exposed to programs that are over your head you will not learn.

Michigan 4H Children's Garden

Rapid technology changes and widespread use of computers are challenging the natural resources interpretive field on the traditional ways of communicating messages. Electronics and the Internet are changing the way in which communications media is presented. Children are growing up in a sophisticated world of advanced technology in which they want stimulation and excitement. Technology is being utilized more than ever as an educational tool, as a means of communication, during leisure activities, and also for fun. In a study published by Marketing Week (1998), eight out of ten seven to 17 year olds have used screen-based technology during the period of one week for playing games, accessing information, word-processing or calculation.

American youth are savvy when it comes to technology. They are aware of new products, can easily learn how to operate technological gadgets, and are accustomed to using technology as a means towards education. While many youngsters use technology for fun and games, many are utilizing the Internet and computer software for academic use. They are also becoming accustomed to learning via current technologies. Following this trend, nature centers, gardens, and parks are increasingly using computer-based programs to teach youth about the natural environment. The challenge lies in assembling the appropriate combination of technology and the natural environment so that youth can learn the difference between the out of doors and what is portrayed on a computer screen.

Definition of interpretation

"An educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information."

—Freeman Tilden, 1957

This definition is encompassed in the interactive computer programs now being offered at the Michigan 4-H Children's Garden. The garden was established for the enjoyment and education of youth in the activity of gardening. However, many lessons related to the natural environment and science can be learned through gardening. Therefore, the garden uses itself as the original object, provides firsthand experience and learning to children and uses the computer program as the illustrative media to convey its educational message. The technology applied at the Michigan 4-H Children's Garden utilizes the principles of interpretation and has added its own technological principles of interpretation communication.

Interpretation Principles:

- 1) Relate the program to the interests of the audience
- 2) Enrich the program with knowledge of the subject being presented
- 3) Don't just talk to the audience, create a story, present the material in an artistic fashion
- 4) Stimulate curiosity of the audience, make them want to ask questions, DON'T provide all of the answers through instruction
- 5) Address the whole story, situation, and process of the subject being presented
- 6) Adapt the program to the audience

Technology is an infrastructure for communications. When combining a natural resource based program and technology keep the following ideas in perspective:

- 1) Technology should be integrated with the learning experience, not considered an "add on" to the program
- 2) Technology enhances the participants experience by providing an additional dimension of exploration of the environment they might not find by "just looking"
- 3) Technology can provide a live group experience
- 4) Technology enhances the learning experience
- 5) Technology overcomes barriers of time and space
- 6) Technology lets children use the tools a scientist would in the process of: gathering information, communication, data collection, data analysis, data presentation, and decision-making
- 7) Kids can imagine themselves as investigators (<http://www.4hgarden.msu.edu>)

The Michigan 4-H Children's Garden, on the campus of Michigan State University, uses computer-based programs to interpret the natural environment in the garden. It encompasses the principles of interpretation and the technological principles cited. Two computer kiosks resembling the garden cottage are placed in the garden, thus integrating the program in the garden setting. The design

of the program uses photos from the garden and real "plant problems" that occur in the garden. Therefore, the Plant Problems Lab computer program is using technology to interpret the immediate surrounding environment.

The Plant Problems Lab computer program leads the users through a series of decision-making steps to decide how best to treat the "plant problem" in relation to how it will affect the surrounding environment and wildlife. First, the plant problems are introduced. A disease, an insect, and a vitamin deficiency are the three categories of problems. Then ways in which to treat the problems are introduced. Do nothing, take out the plant, spray pesticides, etc. are options given to the user. Then a matrix is set up how each treatment will affect the local wildlife in the garden. A dragonfly, frog, bird, butterfly, and a person are among those affected by the treatments. When the users click on one of the treatments, the matrix responds with showing how that treatment would affect the wildlife in the garden. The results of treatment are being presented to the user, not the decision on which treatment to use. Therefore, the user can use the facts to come to their own conclusions.

The computer-based programming used at the Michigan 4-H Children's Garden is a method in which children are learning about the natural environment, while using the learning style they are accustomed to. This in turn creates enthusiasm for the subject and is also an enriching educational experience.

Conclusion

It is important for managers in the natural resources and recreation fields to stay updated on the developments and applications of information technology. Marketing strategies on the internet are different than those utilized in traditional marketing styles. Managers need to know necessary elements to provide a connection for their customers and to create a successful program. Strategies also need to be addressed in how to make information technology friendlier for the user.

"The rapid acceleration of computer and telecommunications technologies is a major reason for the appreciable increase in our productivity in this expansion, and is likely to continue to be a significant force in expanding standards of living into the twenty-first century."

—Alan Greenspan, 1999

Technology is here. How we as natural resource providers, researchers and users decide to use it responsibly is up to us.

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MONITORING VISITOR SATISFACTION: A COMPARISON OF COMMENT CARDS AND MORE IN-DEPTH SURVEYS

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Abstract: This paper compares responses to comment cards and more detailed on-site surveys at selected Corps of Engineers lakes. The results shed light on the validity, reliability, and usefulness of these alternative methods of monitoring customer satisfaction.

Introduction

Recreation managers often conduct sporadic customer service surveys, which provide a "snapshot" of users' satisfaction levels at a given point in time. From this baseline of information, decisions can be made regarding the management of resources, such as staffing priorities, service provision, facility maintenance and development, and so forth. All federal land managing agencies stepped up their efforts to assess recreational customer satisfaction following the 1993 Presidential Executive Order on Setting Customer Satisfaction Standards.

Recreation satisfaction can be ascertained through many different methods. Mail-back and face-to-face surveys can be expensive, time consuming, and somewhat intrusive to visitors, but offer greater opportunity to understand visitor satisfaction and the factors that may impact a visitor's

experience. Comment cards are an inexpensive, quick, and easily interpreted method of gaining information about management issues. A manager can make immediate corrections if a specific issue fails to receive high marks, or conversely, make an on-the-spot award to an employee who is mentioned as extremely helpful, friendly, or courteous. But it is difficult to assess the validity and reliability of comment cards due to the limited amount of data that are typically available.

The purpose of this paper is to compare the results of comment cards and more in-depth customer satisfaction surveys. Data were collected at U.S. Army Corps of Engineers lakes over a four-year period (1995-1998). The Corps began its customer satisfaction measurement initiative in 1995 with unstructured, semi-formal interviews of users at selected lakes. This preliminary research effort was intended to identify what is important to Corps visitors, and how satisfied the visitors were with the same attributes. The following year, various satisfaction items were tested through on-site interviews at two lakes in South Dakota (Burns, Graefe & Thapa, 1997). In 1997, a national customer satisfaction study was undertaken at ten Corps lakes in ten different states across the United States (Graefe, Burns, Titre & Absher, 1999). The following year, a similar study was implemented at three lakes near Huntington, West Virginia (Graefe, Burns, Wickham & Titre, 1999). Concurrent with these onsite studies, comment cards were distributed at selected lakes across the country during the summers of 1996 through 1998.

The analysis focuses on items that are common to both the longer, face-to-face surveys and comment cards used in the respective study areas. Bivariate correlations and multiple regression analyses were used to identify the strongest predictors of overall quality or satisfaction within each study.

Table 1. Analysis of Corps of Engineers Comment Cards, 1996-1998.

Comment card items	Relationship with Overall Quality Rating					
	Zero-order Correlations			Multiple Regression Results (Significant Beta Weights Only)		
	1998	1997	1996	1998	1997	1996
Safety and security	.61	.54	.47			
Park appearance	.69	.71	.61	.21	.25	.10
Restroom cleanliness	.65	.48	.59	.18		.18
Staff helpfulness	.68	.52	.45	.22	.16	
Condition of facilities	.78	.69	.67	.18	.19	.25
General park information	.68	.55	.58			
Water safety information	.70	.55	.56	.10	.14	
Value for fee paid	.72	.71	.67	.26	.29	.29
				$R^2=.77$	$R^2=.70$	$R^2=.63$

Results

Comment Cards

Corps of Engineers comment cards focused on eight specific site attributes and included an overall rating for the site. All individual comment card items were strongly correlated with the overall quality of area facilities and

services (Table 1). Multiple regression analysis shows which combinations of items collectively yield the strongest prediction of overall quality. In all three study years, various combinations of attributes (ranging from four to six items) produced relatively strong models of overall quality (R^2 ranged from .63 to .77). Certain items dropped out of the equations because they had nothing new to

contribute beyond what was accounted for by other variables in the regression model.

The best predictors of overall quality (significant contribution all 3 years) include: Park appearance, Condition of facilities, and Value for fee paid. Other good

predictors (significant two of three years) were: Restroom cleanliness, Staff helpfulness, and Water safety information. The weakest predictors (not significant any year, although still strongly correlated) included: Safety and security and General park information.

Table 2. Analysis of Huntington District Lakes survey items (1998)

Satisfaction Attributes	Zero-order Correlations	Significant Beta Weights
Cleanliness of restrooms	.33	.20
Staff knowledge and ability to answer questions	.23	
Information about commercial services and rec. opportunities in the area	.21	
Value for fee paid	.37	.23
Appearance and maintenance of the area	.26	
Adequate ranger/assistance patrols	.28	.13
Roadside signs and directions	.12	-.13
Information about usage fees for the recreation areas	.20	-.15
Availability of parking spaces (car parking, boat trailer parking, etc.)	.15	
Staff friendliness/courtesy	.12	
Water safety information	.21	
Ease or convenience of paying the fee	.33	.17
		$R^2 = .20$

On-site Surveys

The next study examined satisfaction among visitors to three lakes in the Corps of Engineers Huntington District (East Lynn Lake, Grayson Lake and Beech Fork Lake). In this case, the dependent variable was overall satisfaction with quality of experience at the lake (a 10-point rating scale). Attributes included 12 items representing four domains (facilities, services, information, and fee program). The last domain was a new one incorporated in this study. The items were selected by lake managers in this district.

Prediction of satisfaction was not nearly as strong as for the comment card, mainly because the dependent variable is not measuring the same thing. For the comment cards the dependent variable was an overall rating included at the bottom of the list of specific site attributes. In the case of the on-site surveys, it was a separate question asking for the respondents' overall satisfaction with their experience at the lake. This question is not a direct measure of quality of facilities, services, etc., but rather is focusing on a more subjective measure of overall satisfaction with the experience.

Cleanliness of restrooms and value for fee paid were among the strongest predictors of satisfaction, which is consistent with the comment card results. Adequate ranger patrols and ease of paying the fee were also significant predictors.

The negative beta weights for roadside signs and information about usage fees appear to be an anomaly resulting from the combination of all variables in the regression. The negative sign would imply that overall satisfaction is inversely related to satisfaction with these items, which does not make sense and is opposite of the positive sign for the zero-order correlations for the same items. These coefficients should be interpreted with caution.

Basically, results reinforce the importance of restroom cleanliness and value for fee paid. They do not support the importance of: appearance and maintenance of the area, ability of staff to answer questions, staff friendliness and water safety information.

The final database examined was the 10-lake nationwide Corps of Engineers customer satisfaction study (Graefe et al, 1999). Like the Huntington study, this project involved on-site surveys with visitors at various Corps of Engineers lakes. The list of attributes in this case included 19 items representing the four domains of facilities, services, information, and recreation experience (Table 3). In addition to the 10-point overall satisfaction rating, this survey included separate measures of satisfaction with each of the major domains.

Table 3. Analysis of Ten-Lakes Customer Satisfaction Items

		Multiple Regression Beta Weights (Significant Values Only)		
Satisfaction Item		Zero-order Correlation w/ Satisfaction	Dependent Variable	
			Domain Specific Quality Rating	Overall Satisfaction - Reduced Model
				Overall Satisfaction - Overall Model
Facilities Domain				
Appearance and maintenance of the area		.26	.33	.17
Adequate ranger/visitor assistance patrols		.26	.16	.16
Value for fee paid		.19	.13	.05
Sufficient number of ramps/campsites/parking spaces		.21	.10	.07
* Accessibility for persons with disabilities				
* This item not included because only 8% of visitors reported some sort of disability (220 of 2933 respondents).			R ² = .30 Quality of Facilities	R ² = .11 Facilities Items Only
Services Domain				
Safety and security at the recreation area		.22	.19	.10
Opportunity to offer suggestions to staff		.23	.17	.05
Courteous and friendly staff		.20	.16	.07
Availability of staff to answer my questions		.26	.16	.13
Visibility of staff		.25	.06	
			R ² = .33 Quality of Services	R ² = .09 Services Items Only
Information Domain				
Current and accurate information		.26	.30	.14
Ease of obtaining information		.23	.18	.08
Water safety information		.22	.15	.08
General information about the area		.21	.09	.07
Nature/historical information about the area		.17	.06	
			R ² = .41 Quality of Information	R ² = .08 Information Items Only
Recreation Experience Domain				
Places to recreate without conflict from other visitors		.23	.25	.10
Compatibility of recreation activities at the area		.23	.25	.15
Opportunity to recreate without feeling crowded		.21	.06	.06
Opportunity to recreate without interference from other visitors		.19		
			R ² = .24 Quality of Recreation	R ² = .07 Experience Items Only
		N=2164		R ² = .11 All Items N=2164

Table 3 summarizes results of the nationwide study. The 19 satisfaction items were examined in relation to several different dependent variables. The zero-order correlations again demonstrate that all of the items were correlated to satisfaction at relatively similar levels. The correlations were again much smaller than for the comment cards, because the dependent variable (overall satisfaction) is a more global measure. The first column of regression results (domain specific quality rating) shows the extent to which the items within each domain predict a separate measure of **overall quality for that domain**. The second column (overall satisfaction – reduced model) shows how the items **within a domain** collectively predict overall satisfaction, and the final column (overall satisfaction – overall model) reports how **all of the items combined** relate to satisfaction. Taken together, these data may help in selecting items to retain for future survey instruments.

The regression models for the domain specific quality ratings were always much stronger than the ones for overall satisfaction. This is to be expected since the dependent variable is conceptually much more specific relative to the corresponding items. For some of the domains (facilities, information), these regressions show a single item that is clearly the strongest predictor of quality. For facilities, that item is the appearance and maintenance of the area (Beta = .33) and for information it is current and accurate information (Beta = .30). For the services domain, all four items were about the same, and for recreation experience the first two items were much stronger than the last two.

The regression models for overall satisfaction help to distinguish between other items within the domains. For example, in the facilities domain, adequate ranger/visitor

assistance patrols contributes more to overall satisfaction than the remaining two items. Likewise, in the services domain, the availability of staff to answer my questions appears to be a stronger item than the remaining items. Conversely, in the information domain, two items (ease of obtaining information and safety information) appear just about equal in predictive power. Choosing between these two items might be done by comparing their relative performance in the other data bases.

The items that are shaded in Table 3 are recommended for inclusion on comment cards and similar instruments. These items showed the strongest influence in the ten lakes study and in many cases showed consistent results with the other databases.

Conclusion

Taking the various data sources into consideration, several items can be recommended for further study (Table 4). These items provide a condensed list of attributes that represent the three domains of facilities, services and information. Some of the items may be expressed in several ways, as shown in the "alternate wording" column, while still capturing the intent of the measure. Other items may not clearly represent any single domain, even though they were intended to be part of a certain underlying theme. For example, the last three items, value for fee paid, safety and security at the recreation area, and adequate ranger/visitor assistance patrols, may cut across domains. Evidence presented here suggests that these attributes are important to visitors, even if they do not fall clearly under a single dimension or domain.

Table 4. Recommended Satisfaction Attributes for Future Studies

Item	Alternate wording	Domain
Appearance and maintenance of the area	Park appearance Condition of facilities	Facilities
Restroom cleanliness		Facilities
Availability of staff to answer my questions	Staff helpfulness	Services
Current and accurate information		Information
Water safety information		Information
Value for fee paid		No clear domain
Safety and security at the recreation area	Safety and security	No clear domain
Adequate ranger/visitor assistance patrols		No clear domain

No items from the fee program domain (Huntington study) and recreation experience domain (10-lakes study) are included in Table 4. The fee program-related items were included in the Huntington study to accommodate a particular "hot issue" in that district. These items may be appropriate in areas with similar fee-related concerns, but do not belong on a general list of satisfaction attributes for outdoor recreation areas. The experiential items have not been included on the recommended list because this domain probably cannot be adequately measured in a comment card or brief survey format and should be included only in more elaborate customer service instruments.

Two safety-related items (water safety information and safety and security at the recreation area) showed mixed results in the regression analyses. These items are included in the recommended list because of the overall importance of safety in lake management. Further study of such items is needed to identify the role of safety in visitor satisfaction and the conditions under which safety is most critical.

Items listed in Table 4 should be considered a starter list for future customer service studies. Some of the items (e.g. water safety information) are clearly limited to water-based applications, while others may be more generic to any type of recreation area. These items might provide a "short list"

for a comment card application or a “starter list” for a more in depth study.

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Roundtables

THE FOREST SERVICE'S RECREATION AGENDA: COMMENTS ON THE ROLES OF RESEARCH AND STATE AND PRIVATE FORESTRY IN THE NORTHEAST

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Abstract: The Recreation Agenda is a major document being developed to guide recreation policy within the USDA Forest Service. During the first half of 2000, the Forest Service is holding public involvement sessions on the Agenda, a fluid document which is not yet in final form. One such session held at the Northeastern Recreation Research Symposium included 26 participants who focused on the role of states, nongovernment organizations, and research. Session participants clearly saw the need for increased collaborative planning that crosses agency boundaries. They also identified major roles for partnerships and for market research.

Introduction

Over the past four years, USDA Forest Service Chief Michael Dombeck has established a Natural Resource Agenda that includes four critical program areas: watershed health and restoration, sustainable forest ecosystem management, forest roads, and recreation. The Recreation Agenda (USDA For. Serv. 2000) was released in 1999 as a part of the Natural Resource Agenda. It represents a major effort to guide outdoor recreation policy for the Forest Service and is currently undergoing public review and comment. Consequently, it is a document that is not yet in final form; readers are referred to the most recent version, which is available online at www.fs.fed.us.

As part of the public comment process, the Northeastern Recreation Research Symposium (NERR) held a 1-1/2 hour session on April 5, 2000, that was attended by 26 people representing states, nongovernment organizations (NGO's), the National Forest System, and the recreation research community. As comment on the National Forest System's role in fulfilling the Agenda's objectives had been obtained previously, the NERR session focused on the role of states, NGO's, and research. Copies of the current version of the Recreation Agenda were available to all participants; two notekeepers recorded all pertinent comments.

In this paper we present the results of this session, beginning with a brief review of the Agenda. This is followed by a general summary of the comments as recorded by the notekeepers and supplemented by the impressions of the moderator. While we have attempted to be faithful to the spirit of the session, we have condensed

the comments to capture their essence and combined them under general headings.

The Recreation Agenda

This section on the Recreation Agenda is a condensed version of the material available online. Again, readers are encouraged to view the complete document on the Forest Service website.

The USDA Forest Service is the nation's largest supplier of outdoor recreation, offering diverse recreation opportunities on national forests and grasslands. These opportunities range from wilderness to developed recreation sites on the "urban" national forests (those within a one-hour drive from a metropolitan area). In the lower 48 states, the Agency manages 63% of the wilderness system and a much larger percentage of backcountry opportunities. Within the national forests and grasslands, there are 4,268 miles of wild and scenic rivers, 399 wilderness areas, 133,087 miles of trails, 383,000 miles of roads, 277,000 heritage sites, 4,300 campgrounds, and 31 national recreation scenic areas and monuments (USDA For. Serv. 2000).

As on other public lands, the trend in Forest Service management is away from product extraction and toward aesthetic and ecological management. This direction is supported by the fact that the national forests and grasslands currently contribute \$134 billion to the nation's annual gross domestic product, the bulk of which originates from the recreation opportunities that these resources supply (USDA For. Serv. 2000). However, the lands themselves are beset by problems. The demand for outdoor recreation is burgeoning as Americans are demanding more and varied opportunities of increasing variety, some of which conflict with others. At the same time, the supporting infrastructure is deteriorating: current estimates place the level of deferred maintenance at \$812 million. Growing demand coupled with deteriorating infrastructure cast doubt about the ability of the agency to sustain increasingly scarce quality recreation opportunities over the long run. Consequently, Chief Dombeck established the Recreation Agenda as a major guide to outdoor recreation policy within the Agency. The Agenda itself is aimed at meeting demand while providing high-quality experiences within ecological and social limits. These limits include resource impacts, impacts on other visitors, and the capacity limits of the infrastructure.

The Recreation Agenda has four major goals. First, it seeks to protect ecosystems to guarantee that special settings are conserved. Protecting long-term productivity and landscape integrity is crucial to the supply of outdoor recreation. Consequently, we must protect and restore natural character. To accomplish this the Forest Service must identify key attributes of the natural, social, and built environments essential for both ecological sustainability and recreation opportunity. The Agency must invest in facilities, showcase nationally designated areas, and ensure visitor safety and security by reducing criminal activity and fostering rule compliance. New facilities will be needed that can withstand long-term use and vandalism. Access to

recreation opportunities must be ensured by protecting critical access points in rapidly developing areas by working with local governments and private landowners, and by ensuring universal accessibility. Finally, we need to ensure availability of services to all Americans by incorporating social science and marketing research.

A second major goal is to increase service satisfaction and education. Achieving this goal will require developing partnerships for quality service delivery. The Forest Service needs to conduct marketing research to facilitate cooperation with state and local providers and match opportunities to people. Innovative partnerships can improve conservation education and interpretation, thereby enhancing recreation experiences.

A third goal is to build community connections to expand available resources. Strengthening community connections is vital to ecosystem management. Community collaboration needs to be institutionalized through policy and incentives, and partners are needed to promote community sustainability. Planning must be conducted collaboratively, across boundaries with stakeholders deeply involved in all processes. Also, there are numerous issues on the urban national forests--those within an hour's drive from a metropolitan area--that must be addressed.

The Agenda's fourth goal is to improve relationships. Partnerships and intergovernmental cooperation are essential to recreation management. The Forest Service needs to strengthen business partnerships to find innovative ways to accomplish tasks, and must review professional business practices. The Agency needs to work with community organizations and nongovernmental organizations to train and manage volunteers, and it must promote intergovernmental cooperation and work with tribal governments.

These four major goals have led the Forest Service to develop a six-point action plan for recreation:

1. We must conduct market research to help us know our customers. We need to understand public values, expectations, and conflicts, and use this information to design facilities.
2. We must invest in special places valued by people, repairing ecological damage and reducing deferred maintenance.
3. We must reduce deferred maintenance to ensure long-term financial sustainability. Potential techniques include expanding the Fee Demonstration Program and use of cost-share challenge grants with all sectors.
4. We must develop partnerships for conservation education and interpretive services.
5. We need to develop business opportunities and service for underserved and low-income people.
6. We must ensure accessibility by identifying and maintaining critical rights-of-way, by fostering stakeholder coalitions to manage the forest transportation system, and by implementing Americans with Disabilities Act plans in special areas targeted for funding.

Response to the Agenda

As noted above, the NERR session was attended by 26 people, most of whom offered opinions. The following comments by NERR session participants have been condensed and organized to capture their essence.

Several general questions were raised about the Recreation Agenda as a whole. One concern was why the Forest Service wants to be involved with collaborative activities in general. A second question concerned understanding the nature of the Agency's interest in expanding outward toward communities. Both of these questions demonstrated a lack of familiarity with and understanding of the purposes of the Agenda: Why is it not sufficient for the Forest Service to be concerned about the management and planning of its own lands? Why is there a need to be concerned about other agencies and jurisdictions? Concern also was expressed that we should not identify recreation as the new "commodity" to replace timber. Recreation may not be a satisfactory goal if viewed as a commodity; rather, we should emphasize stewardship and the protection of special places. Finally, one participant believed that the Agenda was overly conservative--too "comfortable"-- and lacked bold initiatives to deal with issues of stewardship and deferred maintenance.

Specific concerns dealt with both Forest Service/state relationships and the role of research in recreation planning and management. Forest Service/state relationships are of particular concern in the metropolitan Northeast where state natural resource agencies are major suppliers of outdoor recreation. There was general agreement that the national forests within Region 9 are special because public land is scarce in the East and these forests play a crucial role in conserving recreation opportunities not provided elsewhere. However, given the scarcity of federal public lands, states, counties, and municipalities also occupy critical positions in the recreation service delivery system. These complex relationships present a major challenge to integrated recreation planning. There is wide recognition that planning efforts require coordination to be successful, and that partnerships and collaboration are essential for both state and federal agencies. Unfortunately, coordination is difficult. At the state level, many agencies have no tie to the State Forester, and hence no tie to the State and Private Forestry branch of the Forest Service. In New York State, for example, four separate agencies deliver outdoor recreation services: the Department of Environmental Conservation (DEC), the Office of Parks, Recreation and Historic Preservation, the Adirondack Park Agency, and the Palisades Interstate Park Commission. Of these, only the DEC has ties to the State Forester.

One potential alternative for planning coordination is to reactivate the Statewide Comprehensive Outdoor Recreation Planning (SCORP) process. Originally established under the Bureau of Outdoor Recreation, SCORP now is administered by the National Park Service. However, the program has been largely inactive in recent years due to lack of funding for the Land and Water Conservation Fund.

Partnerships also need attention; partnerships with publics are required to improve agency credibility. One possibility is to use the "adopt a highway" approach to maintain recreation facilities. Facilities need to be monitored and receive at least some maintenance. This kind of collaboration can be enhanced by "benchmarking" and sharing information on "best management practices." Unfortunately, session participants also noted a downside to this kind of partnership: While an "adopt a trail" or beach approach can help foster ownership, this kind of "ownership" could become too strong and work against management goals. Partnerships also can be costly to administer, requiring scarce resources that might better be spent on the lands themselves. Finally, the emphasis on "business practices" may not appeal to many NGO's who may see them as promoting competition rather than cooperation.

Planning must have strong ties to research as well. Local forest levels have specific research questions that need to be addressed. However, broader, potentially more fruitful areas of research also were discussed. One topical area identified for emphasis was market research: What do people want? How do users compare to nonusers? What are the needs of specific groups such as minorities or older Americans?

A second area for research concerned the Recreation Opportunity Spectrum (ROS). We need to rethink the ROS classes for eastern forests, where greater differentiation at the urban portion of the scale may be necessary. Moreover, we need to develop productivity standards for sites and facilities within each class to help prioritize sites and facilities for maintenance. Decision-support systems are needed to tie this information to the planning process.

Finally, we need to be concerned about the economics of forest recreation. We must develop additional tools such as conjoint analysis to understand the tradeoffs people are willing to make, and decision-support programs to facilitate analysis of alternative actions. And we need to examine the role of public forest lands in enhancing regional economies. For example, can trails or other facilities be located closer to communities to enhance economic impacts?

Clearly, there was general consensus that forest planning needs to be closely tied to research and that additional concept development is needed in the East, where public forests are scarcer and hence more critical in fulfilling the recreation needs of the population.

Conclusion

The Forest Service's Recreation Agenda provided fertile ground for discussion among the 26 participants in the NERR session. There was general agreement that planning efforts would require coordination across state and federal boundaries, but this could prove difficult given the multiplicity of agencies involved. Unfortunately, there was little discussion of mechanisms to achieve this. The group also expressed strong support for establishing partnerships

while noting that such partnerships must be managed carefully to avoid conflicts. There was a clear consensus for research involvement in the planning process. Among the high priority research topics identified were market research with respect to minorities and older Americans, rethinking the ROS for eastern forests, and developing decision-support systems for recreation.

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DEVELOPMENT OF A USE ESTIMATION PROCESS AT A METROPOLITAN PARK DISTRICT

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Abstract: The need for a committed system to monitor and track visitation over time is increasingly recognized by agencies and organizations that must be responsive to staffing, budgeting, and relations with external stakeholders. This paper highlights a process that one metropolitan park agency uses to monitor visitation, discusses the role of validity and reliability in the establishment of a sustained counting system, and highlights some of the challenges and limitations inherent in estimating visitation with inductive loop counters.

A Committed System for Use Estimates

Many agencies concern themselves with the extent that their facilities are used. Since the early 1960's there has been a growing body of literature concerning use estimation methods for park and recreation agencies. Accurate and reliable visitation estimates can improve the success in decisions concerning new exhibits, facilities, and maintenance schedules. They also serve to communicate to funders and citizens the value that parks serve and the extent that they are used. Many grant sources now insist that use statistics be demonstrated as a prerequisite for major capital grants to be distributed.

Even though countless resources have been published and counting systems attempted, for many agencies, reliable sustained visitation counts remain elusive. For many, these counts are generated based upon best guesses or limited observations by counting only a few days of park use. However, there can be significant swings in visitation across a season, month, week, or even within a single day (Gregoire & Buhyoff, 1999; Hornback & Eagles, 1999). What need is a valid, yet "do-able" counting system that captures a majority of park visitation and tracks this use over a sustained period of time. In today's information-driven organizations, it will no longer be sufficient to conduct a major visitor initiative every 10 - 15 years in conjunction with master planning processes. Committed visitation functions internal to the agency or regular contracting which sets up a system for an individual agency (or region), will be needed to track use over time and report these statistics to stakeholders on a yearly, and sometimes monthly, basis.

The Evolution of Cleveland Metroparks Use Estimates

In 1993, Cleveland Metroparks sought to improve its visitation counting effort by creating a systematic process, which combines visual counts with mechanical counter data to generate use estimates for all of its fourteen parks (called reservations). Previously, the Park District had relied on extrapolations from survey data to estimate visitation (i.e., percentage of people who said they visited a park and how many times they said that they visited). This information was combined with limited mechanical counter data to also estimate commuters who drove through but did not stop. However, a new process was designed to count use from both commuters and recreationists more thoroughly. This effort was spearheaded by the incumbent Research & Program Evaluation Manager with the assistance of the Executive Director, other park directors and three part-time attendance counters.

The Use Estimation Process...

There are six basic steps used in generating Cleveland Metroparks' visitation estimates:

1. Determine park entrance and exit points and their characteristics of use.
2. Visually count entrances for the number of people per vehicle and the percentage who enter through each roadway entrance within a particular park.
3. Install inductive loop counters at strategic and representative park entrances.
4. Check and maintain mechanical counters on a monthly basis (i.e., take counts and reset the meter, adjust for sensitivity, change batteries, and ensure that the box is secure and/or undamaged).
5. Create use estimates by combining mechanical counter data with vehicle multipliers and entrance weights in Excel spreadsheets.

(For example a park with one mechanical counter with a reading of 10,000 vehicles, an entrance weight of .25, and a vehicle multiplier of 1.5 people/vehicle would yield a visitation estimate of 60,000 people for that park).
6. Tabulate these estimates by park, by month, and across several years.

Cleveland Metroparks uses this counting procedure to estimate the following types of use:

- Visitor Occasions - people who enter the park district for any reason (i.e., includes commuters, other non-recreational use)
- Recreational Visits - People who enter the Park District and visit parking lot and recreation areas

Recreational Visits is a sub-set of Visitor Occasions although it is possible that some parking lots can get used as a turn-around for parkway commuters.

Given that walk-on traffic may represent a considerable sub-group (and that they cannot be counted with inductive loop counters), an upward adjustment of 3% - 5% is currently added to this Recreational Visit statistic. However, this arbitrary adjustment is rather subjective thus, Cleveland Metroparks is now making efforts to conduct surveys within a sample of parks to determine the percentage of visitors who access the park by walking, bicycling, etc.

Visitation Data for Cleveland Metroparks is presented in Table 1. The reader is cautioned that while there appears to be slight increases in visitation each year (especially in the first four years), most of this increase is likely due to changes (improvements) in counting methodology at specific parks within the Cleveland Metroparks system. It took approximately four years to generate visual estimates and to install counters at all of the fourteen reservations within the Cleveland Metroparks' system. Agencies who have multiple parks under their jurisdiction, should also expect a similar start-up period unless they: 1) only have a few parks with easily defined entrances, or 2) have extensive staffing to conduct visual counts throughout the year. At Cleveland Metroparks, visual re-counts were also required at some of the parks due to dramatic changes in traffic patterns and facility construction. When these improved use estimates were integrated into this fledgling system, there were instances where some parks would have their estimates increased by 50% just because a new entrance weight and vehicle multiplier was used.

After five years of counting with the same multipliers and entrance weights, visitation showed much slower growth or, in some years, decline. The lesson here is to take time and effort to generate valid visual estimates and provide counting coverage at the on-set of a counting initiative. The first years of a counting effort should focus on the validity of the estimates without trying to place too much emphasis on changes over time. It is likely that changes in visitation will be due to refinements made in the counting methodology, rather than any real increase/decrease in visitation. However, once the methodology is established and used consistently, subsequent estimates are more likely to be useful in tracking visitation trends over time.

Unfortunately, there are instances where changes in the character of park use will mandate that re-counts be taken. Therefore, the question of invalid estimates is never fully resolved, but only minimized. The hope is that, once a counting system is established, wholesale changes in the methodology will not be needed and slight adjustments will be all that is required. Slight changes made after the counting system is established will have a smaller impact than changes made during the early years, when some estimates are based on guessing until they can be counted and integrated into the system.

Table 1. Cleveland Metroparks Attendance (1993 - 1999)

Year	Visitor Occasions	Recreational Visits
1993	34,238,948	9,792,339
1994	34,793,894	9,950,228
1995	40,068,920	11,977,726
1996	49,778,861	13,749,994
1997	50,391,541	14,005,832
1998	48,516,922	15,753,691
1999	51,948,608	15,907,714

Advantages/Pitfalls of Using Inductive Loop Counters

Using inductive loop counters offer many advantages for park districts whose visitors enter through multiple vehicular entrances. They are economical in terms of unit cost (\$280 to \$400, depending on the features available). Their solid state design makes them more resistant to vandalism and varying climates than other counters. However, inductive loop counters are not without their pitfalls. They require personnel resources to install, continually monitor, and adjust for sensitivity. Moreover, unless census counts are taken at each park entrance, they require personnel to make visual counts (for vehicle multiplier estimates and for entrance weights). Another limitation is that these counters cannot capture walk-on traffic into a park. For parks that receive substantial walk-on visitation (i.e., 40% or more), some other counting methodology should be considered.

Future visitation counts at Cleveland Metroparks will refine this existing methodology by conducting visual re-counts and by conducting surveys to estimate the percentage of walk-on traffic that is currently estimated from a "best guess." Recreation use within specific park areas (i.e., pavilions, swimming areas) will also be conducted to help managers understand use at a more site-specific level. Creating both an accurate and a reliable visitor attendance tracking method takes resources, time, and commitment on the part of an agencies' leadership and constituency. The fruits of such an effort will yield useful and accessible information, for multiple purposes. More detailed information on Cleveland Metroparks' park visitation methodology and the 1999 *Park District Visitation Report* may be obtained from the Research & Program Evaluation Division, Phone: (216) 635-3277.

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NATURE SPEAKS - AN EXPLORATORY STUDY OF NATURE AS INSPIRATION

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Abstract: Artists, composers, writers, and photographers who have been inspired by Acadia National Park and Baxter State Park, share their thoughts about the importance of nature to creativity, their feelings about park landscapes, their need for personal expression and the importance of sharing the inspirational experience. Implications for a better understanding of the park experience as re-creation are discussed, along with managerial considerations.

Background

The idea that nature speaks to us at some conscious or subconscious level seems to be a fairly comfortable view for many despite a scarcity of scientific corroboration. Nature's messages of beauty, grandeur, danger, and mystery, often communicate as well or better than the signs we erect to say the same things.

People commonly say that a certain scene "speaks to me"-meaning that it resonates in some way with their sense of place, their memory banks, their curiosity, or their concepts of appropriateness and beauty. A few individuals are convinced that they actually receive sensory messages from wild creatures, plants, landscapes, seascapes, and inanimate objects in nature.

The inspirational powers of nature seem to be unarguable. How we Process and act upon that inspiration is probably as diverse as our individual skills and abilities -- a painting, a photograph, a poem, a donation of time or money, a musical composition, and a performance might all result from a single inspirational moment or scene.

The inspired works vary not only in their style of expression, but in their emotional intensity. A single snapshot may suffice to capture the mountain's power for one photographer, while for another appreciating the mountain may mean a collection or even a life's work. Perhaps, in much the same way, one mountain climber may be content to conquer it with a single ascent, while for another, knowing the mountain may not happen with a hundred visits.

The range of creative responses to nature's inspiration seem almost kaleidoscopic and, for this research, was defined to include a limited number of people who have responded to their inspiration from two of Maine's public parklands: Acadia national park and Baxter state park. Their creative works in music, the visual arts, the performing arts, in literature, and through volunteerism, are but a sampling of what these public assets mean to people. Their insights have the capacity to move us emotionally just as their authors were moved by the shouts and whispers of nature.

These interpretations of nature share many common characteristics, from a strong sense of exhilaration, to a need for capturing, sharing, and extending the moment, to feelings of humility, conflict, caring, and concern.

Over the past Century there have been numerous perceptive social commentaries linking the American Spirit to wilderness, perhaps beginning with Frederick Jackson Turner's concern for our collapse after conquering the last frontier. In fact, however, America's artists, writers, and composers had been celebrating the wilderness for much of the previous Century and continue to do so today. The distinctive American culture, like its spirit, is profoundly a product of the wilderness. And, yet, we seldom think about the sources, as we enjoy popular music like John Denver's Rocky Mountain High or symphonic pieces like Ferde Grofe's Grand Canyon Suite. Similarly, when we admire the classic art of Church, Bierstadt, or Remington, or the powerful photography of Adams and Porter, we recognize their interpretive genius with little thought about the inspirational event that must have been associated with the work.

In the 1980's, when I was writing a feature article for Parks and Recreation on wilderness and culture, I had the good fortune to make contact with Richard Adler, composer of The Wilderness Suite and The Yellowstone Overture (along with such Broadway hits as Damn Yankees and Pajama Game). Adler told me that at the moment he first saw The Grand Canyon of the Yellowstone he saw not just colors but he also saw notes on a musical scale.

The background music you heard as you came into this session is from a composition called "A Sense of Acadia" by a Maine composer, Barbara Smith. Compare what she says about the moment of her inspiration with Adler's moment of inspiration: "I didn't really have to sit there and wait for the music to come. By loving the outdoors and feeling very serene and peaceful and appreciative of being there, it just all came together. One of the tunes I wrote while sitting at Somes Sound. It was one of those beautiful blue sky late September days and the sun was like diamonds on the water and this tune just came to me just very bright and lively."

And compare Smith's description of the moment with that of Tom Paquette, an artist from Portland, Maine, whose work focuses on very similar settings: "I definitely see whispers -- it's landscapes that call out to be painted ... I have to turn and look, and I think what was that? What is that?...and then I try to recreate those whispers....sometimes I want to shout the whispers, and whisper the shouts....it's the experience of whatever nature is that I'm after. I once tried to paint from somebody's photos and it was a disaster because I didn't have the experience. It isn't the mountain, I can't know the mountain ... that would be presumptuous.

Finally, compare these insights with the words of Michael Lewis (whose Acadia painting was inspired by the same setting as Barbara Smith's piano composition), and the range of emotions he feels as he begins to paint: "Gradually

I don't feel like I'm an observer, a part of it, the dissolving of that distinction is invited by the landscape and it lets impressions just come in. Sometimes I'm not even aware of what it is that I'm going to focus on when I start painting. I feel like I need it the way I need to breathe, the way I need to take in food."

I hope that these few insights might provoke you to wonder about the connections between inspiration and creative expression. We need to better understand these connections if we wish to truly preserve all of the values that these protected public lands have to offer us. Productions like these, along with the mental renewal and inspirational transfer that they represent, tend not to show up in the park's annual reports of numbers served, revenue generated, programs offered, and acres protected. And yet, are they not reflective of the real output of our protected lands? Isn't there a direct connection between these inspirational resources and the positive attitude, the pride, the challenge, the sense of wonder that epitomizes American Spirit? Isn't there a direct connection between their experiences and the visions of the donor's of these lands? Some very preliminary findings from the interviews seem worth sharing.

Some Observations About Creative People:

Emotional High. John Denver captures the essence of what many artists report in describing their feelings of the inspirational moment, in his Rocky Mountain High. John Muir's almost rhapsodic descriptions of The Range of Light that he found in the Sierras reflects this same intensity of emotions as does Walt Whitman's poetry, and Ansel Adams' photography. It is both a range of emotions (awe and humility, ownership and belonging, sharing and protecting) as well as an intensity of emotions that that can block out other concerns and even sound judgment (almost like the feeling divers report as "rapture of the deep.") Michael Lewis, whose Acadia painting you see on the easel, says: "The range of emotions is amazing . . . It isn't just visual, -- it takes you away from the human context -- It's like being a kid again --- It's so sensorial --- there's nothing like it."

Humility, or perhaps more appropriately awe, is another recurring theme in response to questions about inspirational moments. However, it seems not be a universal trait as the following excerpt from the early 20th Century landscape painter, Marsden Hartley's correspondence with a colleague reveals: "I shall immortalize that mountain, and no else has or likely will, as it is my mountain and I the official portraitist of it." Not surprisingly, his descriptions of Frederick Church's voluminous Katahdin art, from the previous century, are far from complimentary: "The pictures I remember were what I call ice cream pictures, pretty and meaningless, we found them in calendars."

Capturing the moment. It's the moment, not the mountain, seems to be a common theme. For a photographer, the moment, the perfect light effect, shadows, wildlife activity, reflections, clouds, and other ephemeral visual components of the scene provide an obvious moment. It is a fleeting

experience mentioned by painters as well. Volunteers sometimes seek to capture or re-live the moments that inspired their volunteerism.

Beyond the Moment -- It's The Experience. "Sometimes I just put away the tools, so that I can simply enjoy the experience myself with no thought of having to share it."

Beyond the Experience -- It's the Spirit. "And then there are times when the experience evaporates into a profound sense of the landscape and its history, the first people to sail into Frenchman's Bay at Acadia, or even beyond that into the pre-history of geologic time."

Sharing the moment. Or, at least sharing the opportunity for similar moments, cuts across all of the subjects. There would be little point to the capture, if sharing was not the expected outcome. But the sharing seems to be vastly more than "show and tell." It is the validation of the effort. From the sale of images, the publication of recordings and books to the recognition of volunteer efforts and teaching excellence, the sharing provides a vital source of approbation and feedback.

Caring, and concern, about the landscape is, not surprisingly, a repeated theme in these interviews. It would be easy (and erroneous) to assume that volunteer creativity reflects a more caring attitude than does commercial photography. While income may be an over-riding concern for many, it is curious to note how many of the artists in this study also volunteer their time to supplement park staff and freely donate their works in support of park causes. Caring is clearly a powerful motive for many of the volunteers who keep doing strenuous tasks well into their retirement.

Signature, identity, individuality, and distinctiveness of style, are closely related to the artistic response and to sharing that response. It is both a way of identifying with the source of the inspiration as well as a way of insuring feedback from sharing. It is consistent with the complexity of emotions and the apparent contradictions expressed throughout these interviews. Volunteers often see their work as unique, a representation of themselves, even a signature of their particular style of trimming the brush alongside a trail, or rock work to stabilize a mountain trail, or in building a water bar on a trail, or a trail marking cairn above tree line. (Don Curley, a long-time Acadia trail volunteer: "If you can't write or paint, it's a way of expressing yourself.")

Essential Conflict. All subjects alluded to a degree of conflict that they experienced, expected, perhaps welcomed, in the process of a creative response to the inspirational moment. Perhaps "creative tension" might be a more appropriate description for wanting to keep the moment private and yet share the experience. Similarly, feelings of wanting to experience the moment for oneself while having to capture it for others, can be opposing forces. And, very likely, doubts as to technical adequacy in the face of often-times awesome natural spectacles can produce additional tensions, e.g., reducing Mt. Katahdin to

20x18 canvas. Consider the tensions contained in the following: finding an identity within the landscape, yet having an identity uniquely your own; sharing the moment, yet needing to protect the site from too many others visiting it and spoiling it; reveling in the freedom of the moment, yet needing to capture it; being humbled by the scene, yet hoping to become identified with it. Volunteers frequently express a deep-seated conflict with park visitors who are uncaring about their environment, as well as a sense of conflict with the bureaucracy that administers the parks. And yet they continue to volunteer.

Some Implications for Research and Management:

Creative People as Park Visitors: Because of their intensity, creative people provide us with a chance to have an in-depth look at a common phenomenon - inspiration and to learn from it. If you are a geneticist, you probably would prefer to study something that reproduces intensively not once every 20 years. If you are a seismologist, you probably want to work where the earthquake activity is most intense. If you want to understand activism, you'd prefer to study the crusader, rather than the dilettante. In the same way, if you are interested in emotional connections to the land, you can probably learn a lot about everyone's needs for re-creation by studying those who feel them most intensely, and are best able to articulate and act on those feelings.

Creative People as Park Staff: Perhaps we should be looking at these people as the land's volunteer cheer leaders? Ansel Adams photography, for example, has undoubtedly influenced millions of people to go see for themselves, and to help preserve those landscapes, and to become photographers themselves.

Painters, composers, writers, volunteers, and teachers probably bring much more than their art to staff discussions. Doesn't the presence of creative people increase staff creativity, and enhance job satisfaction? Does it help increase staff sensitivity to the public as individuals?

So, how are we treating this extended staff? I've heard that some national parks have tried to require commercial photographers to get a permit. While the distinction between commercial photography and photography for commercials is admittedly vague, I doubt that they tried to do that for composers, writers, and painters.

Creative People as Research Subjects: How does primary inspiration (from nature to the artist, teacher, or volunteer) differ from secondary inspiration (from the creative work to a broader public)? What are some creative outcomes of this "secondary inspiration?" Do primary and secondary inspiration breed creativity among people who do not consider themselves "creative?" How does the inspiration to share directly (through volunteerism and teaching) differ from the inspiration to share indirectly through art?

How does the inspiration to preserve differ from that to develop? How can we build an ethical foundation to protect the inspirational resource and to compete with the development ethic?

Creative People as Indicators of Park Health and Vigor: These people are unique their inspirations may not be. You only have to listen to the clicking of 3-dozen cameras and the in-drawn breaths when the tour bus unloads at the top of Cadillac Mountain to realize we are all inspired by the spectacular in nature. What is different is the ways that creative people see nature, their responses to it, and their styles of sharing the experience. To the extent that we compromise the experience for them, we compromise it for all. These are management's indicators of a healthy park environment, their canaries in the mine!

If we over-manage, bureaucratize, and over-develop the outdoors, creative people will be the first to know and to react. When looking for public reaction to our development plans, the concerns of creative people may very well be a threshold that we need to be alert to. When do the pressures for increased development compromise creativity? (If we can accept deferred maintenance, why not deferred development?)

Many of these people comment on the productive settings that they find in parks. How can we avoid damaging those settings? What's the connection between productive settings, life changing experiences, and management? When visitor numbers begin to reduce the quality of individual visits; and where is it most likely to first become evident? How can we avoid over-managing creative people? Volunteerism is a form of creative expression. Are we sometimes over-managing our volunteers to the point of destroying the experience and turning away volunteers?

Creative People as Products of Park Systems. Several of these people alluded to the parks, and to parks residency, as being turning points in their careers. To what extent do we see parks as life fulfilling potentials? Parks as catalysts for change? Parks for re-creation, need to be managed quite differently than parks for recreation.

Many parks close their gates without exception (well maybe they open them for VIP's) at certain times of the year. Perhaps these are the times that are best suited for many creative people to visit, when the distractions are minimal? Do we try to make exceptions for the very people who can best help us to achieve our goals?

How do we honor donor/founder vision -- was it quality or quantity? Should we consider a revised annual report format focusing on quality -- quality of experience, of life, of lives changed, of the resource itself? If quantities of visits, programs, income, acres protected, etc. must take center stage, we should, at least, consider appending 1 or 2 narrative testimonials of quality experiences. Should we, perhaps, ground our philosophies of Limits of Acceptable Change in qualitative terms; and develop some inspirational indices?

Note: The research reported here is from the first year of a 4-year project. For further information or annual updates, contact the author at: will_lapage@umenfa.maine.edu

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Excerpts from the Acadia Artist in Residence Journal 1994-1999

In general I prefer the low tide and being out early or at dusk the animals are more active, and the sounds more apparent. The fog insulates me from the larger world, and the details here are endlessly interesting and beautiful. The textures of the plants, the rocks, sea weeds, lichens, . . wish I could explain how I make a musical correlation to something visual or from the smell of low tide.

Elizabeth Brown, Composer, Brooklyn, NY 1999

The Maine coast is a living brush painting and I have been delighted beyond belief. Acadia is paradise! This residency has provided me with solitude and the greatest gift of all, time. Time to contemplate. . . time to meditate. Johanna Scholfield Ruggiero, Mixed Media Cambridge MA, 1999

Each day I experienced many different emotions. I would wake up with lots of plans and find that the best plan was to experience Acadia . . . observing the strong contrast of light against strange shaped rocks or stripes of light crossing the darker greens of a pine tree. . .

Pamela Braverman Schmidt, Oils Salem, MA 1997

The jagged crumbling cliffs surrounding the cave composed of all sorts of stone tell quite a story in a language only the earth really understands. But the story is tantalizingly close to obvious even for a geological illiterate like myself . . smashed fragments of boulders suspended in newer rock layered between glopping sandstone then flipped upright by some magnificent force, scrapped by glaciers, eroded by time. . . . it doesn't get much better than that . . the brown

trees are now timidly trying on their new spring fashions. Some in green, some in red. . .

Tom Paquette, Oils Portland, ME 1994

There is poetry in the Acadian woods and music wherever I walk. . . There are lyrics in multi-colored leaves, flickering bright red and green and cadmium yellow in the brilliant mid-morning sun, and in the blowing fog . . in birch trunks

shining white on a near-by ridge, in sun dappled rocks tumbling down from granite summits. .

David Halperin, Landscape Photographer 1994

For me, Acadia is a uniquely intimate setting -- so enveloping and warm, like being home in the aroma of mossy damp woods, sea spray and the pungent smell of tide lines, the sound of wind in the tree tops, water trickling down granite walls, and the rushing surf. The sound of breakers rushing back to sea with what was once a wave creating a symphony of sea and land that captures the essence of timelessness. Witness that which has occurred for thousands of years and one can find themselves stepping back to a place of belonging.

R. Scott Baltz, Landscape Photographer Millville, DE 1996

Park Landscapes as Re-Creation -- Special Moments of Creative People

"It's about getting to the summit and kind of dissolving yourself a little bit into the elements, into the mountain itself, and losing yourself and becoming one with the mountain. . . . it was an overcast gray day, and the five dancers were on a rock at the summit and at a point in the dance where they were opening their arms and looking skyward -- and at that particular moment, the sun broke through and all five broke into tears. It was an incredible moment and the audience responded the same way - it was one of the most spell-binding moments that I can remember -definitely a 'ten'!"

Dianne Eno, Dancer/Choreographer, Artist-in-residence, 1999, Acadia N. P.

"I'd hiked up to the pond before daybreak and had everything set to capture a Katahdin sunrise. . . . and as it started getting lighter, I happened to notice a moose down the shoreline watching the expanding rim of light with me. . it was one of those special moments when everything stops and you don't even realize you're breathing. . . I always feel that nature is overwhelming but in a good way. . . The idea that I am such a small part of it is a wonderful feeling .

. . . to be in awe of . . . its almost a religious feeling, compelling, but not really one with nature. . . "

Terry Lester, Landscape Photographer Deer Isle, ME

"It isn't the mountain because I can't know the mountain. It's not my job to interpret the mountain, or even offer the mountain as expression of mine. Both of those things seem presumptuous. How can I interpret the mountain, and why would anybody want my interpretation? It's more an interpretation of someone experiencing the mountain or an interpretation of consciousness. I am trying to paint what I experience, it's a response. I don't presume to know what Katahdin is as a mountain"

Tom Paquette, Landscape Painter Portland ME

"It all came very quickly and very easily. I didn't really have to sit there and wait for the music to come." "By loving the outdoors and feeling very serene and peaceful and appreciative of being there, it just all came together. One of the tunes I wrote sitting at Sones Sound -- it was one of those beautiful blue sky late September days and the sun was like diamonds on the water and this tune just came to me just very bright and lively."

Barbara Smith, Composer Orono Maine

I'm suffering Katahdin withdrawal. I've been going a lot almost once a month to see the mountain, it's been very intense experiences , , to film, but also you're hurting to get up there. . . it's almost like a withdrawal thing. . I was becoming very intimate and connected to the mountain. "

Huey, (James Coleman) Videographer Portland, ME

Dr. LaPage teaches courses in environmental interpretation, and issues and ethics in outdoor recreation at the University of Maine. He has taught at the Universities of Wyoming, Colorado State, and New Hampshire; and has served as Director of NH state parks, director of the Wolf Education and Research Center, a N. H. Fish and Game commissioner, US Forest Service scientist, and a member of President Reagan's Commission on Americans Outdoors.

GREAT GULF WILDERNESS USE ESTIMATION: COMPARISONS FROM 1976, 1989, AND 1999

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Abstract: Wilderness visitor monitoring techniques can provide important baseline information on recreational use and assist managers in making recreation use management decisions. A demonstration project was conducted in the Great Gulf Wilderness using active infra-red beam type trail counters and brief on-site interviews to obtain information about visitor travel patterns, wilderness destinations, and estimate total recreational use by trail segments. The spatial and temporal distribution of use was analyzed to understand the concentration of use that occurred in the Great Gulf Wilderness.

Introduction

Recreational use in the National Wilderness Preservation System (NWPS) has increased greatly over the last 40 years, but the same trend has not been evident in all wilderness areas (Cole 1996). Overall, wilderness recreational use is expected to continue to grow at a more modest rate in the future within the NWPS and many individual wilderness areas (Cordell and others 1990; Cordell and Teasley 1998). This study reports on recreational use of the Great Gulf Wilderness during the summer of 1999 and compares some information from similar studies over the last two decades.

The Great Gulf Wilderness was designated under The Wilderness Act of 1964. The 5,550 acre area is located in the White Mountain National Forest (NH and ME) with Mt. Washington and the Presidential Mountain range forming the main boundaries in all directions except the eastern side. The Great Gulf Wilderness includes the basin area within the crescent shaped Presidential Mountain range, but not the summits of those mountains. This small wilderness is within a five-hour drive of the major metropolitan areas of Boston and Montreal.

Management of wilderness use is necessary to protect the wilderness resource and the wilderness experience for users (e.g., solitude). One of the first requirements for sound wilderness planning and management is to establish a baseline level of recreational use and then monitor for changes in use and subsequent changes in the wilderness resource and the wilderness experience. Numerous direct and indirect methods of estimating recreational use are available and each has strengths and weaknesses (Hollenhorst and others 1992; Yuan and others 1995; Hornback and Eagles 1999; Watson and others 2000). Wilderness area managers reportedly use a wide variety of techniques to estimate recreation use and many areas use a combination of estimation techniques (Washburne and Cole 1983). Systematically observing visitors and interviewing them (or requesting names and addresses for a later mail surveys) at a sample of trailheads is often used, but highly variable use patterns make reliable sampling difficult and costly. Large samples are difficult to obtain because of the extensive land areas, numerous access points, and variable recreation use both temporally and spatially in many wilderness areas. Although stratified sampling can be designed to concentrate monitoring on more heavily used times and places, thereby increasing the efficiency of sampling, it requires some information on recreation use patterns to plan a sampling stratification approach.

One approach that can partially reduce the cost and staff time involved in estimating recreation use is data collection with trail traffic counters. O'Rourke (1994) reports that the use of automatic electronic traffic counters on trails has been increasing, because of new technology and improved operation, especially with higher accuracy active infrared systems. An active infrared system emits an infrared beam to a receiver or reflector and registers a count whenever there is an interruption by some large object moving through the beam. Active infrared types of counters cannot identify whether the objects were hikers, packhorses, or deer, nor direction of travel (e.g., entry or exit). However, automatic counters, like active infrared types, are being used in a number of wildernesses, in conjunction with other methods (e.g., user interviews or mandatory permits) and provide useful information, especially to estimate trends in recreation use (Hollenhorst and others 1992; O'Rourke 1994; Yuan and others 1995).

The objective of this study is to demonstrate the utility of trail counter systems when used with brief on-site interviews to obtain information about visitor travel, destinations, and estimate total recreational use by trail segments within the wilderness. User information is then compared with data obtained from previous studies in 1976 (Leonard and others 1978) and 1989 (Cross and Davis 1989) to estimate trends in use within the Great Gulf Wilderness, although the previous studies do not use the same research methodologies.

Methods

A research study of hikers in the Great Gulf Wilderness in the White Mountain National Forest of New Hampshire

was conducted in the summer of 1999. The study research design reported here consisted of two parts:

1. Estimating hiking use with automated counters, having infra-red beam technology, at the eight access trails into the wilderness area during June 2 to September 11, 1999; the counters measured exit or entry events in the wilderness area and data was recorded by site and date.
2. Measuring wilderness use and travel patterns via brief on-site interviews during June 2 through September 2, 1999 at the two major access sites to the wilderness; a total of 316 users were systematically interviewed and were included in the analysis.

The summits of the mountains in the Presidential Range are some of the primary destination points for users, but these summits and ridgeline trails are outside of the Great Gulf Wilderness boundary. Total visitor use in the Great Gulf Wilderness was estimated from the trail counter units and adjusted with the interview information for the number of entrances and exits made by a visitor during their trip. For example, some visitors only had one entrance and one exit for a trip while others came into the wilderness (1st entrance), then climbed a summit like Mount Madison outside the wilderness (1st exit), and returned to their camp in the wilderness (2nd entrance) and left for home the next day (2nd exit). Thus, the counter data had to be adjusted for the proportion of users with one, two or three exits and entrances during a single trip to the Great Gulf Wilderness.

Results and Discussion

Short trips, both in distance traveled and duration, are characteristic for most wildernesses (Lucas 1980). In 1999, Great Gulf Wilderness visitors were most often day hikers (55%) and those that stayed over night in the wilderness (45%) did so for an average of 1.5 nights. The percentage of day hikers in 1989 was nearly the same with 54%, although the 1976 study reported 75% day use. The average length of stay for overnight users was 1.5 nights in 1989 and 2.0 nights in 1976.

Forty-seven percent of the visitors to the Great Gulf in 1999 had been there previously for an average of 4.4 previous visits. Most visitors were from the northeastern states. The states and provinces that contributed the most visitation were: Massachusetts (28%), New Hampshire (20%), Connecticut (8%), Maine (6%), New York (5%), Province of Quebec (5%), Vermont (3%), New Jersey (3%), and other states and provinces (22%). A similar percentage contribution of these northeastern states and provinces was reported from the 1976 study; no comparisons were available from the 1989 study.

Comparisons in recreation use between the 1976, 1989, and 1999 study results are difficult because all three studies used different research designs and data collection methods. The visitor use in 1976 was estimated at between 2,978 and 3,838 visitors from July 3 through August 27, 1976 (Leonard and others 1978). In 1989, visitor use was projected as 9,000 to 10,000 visits annually, with 7,923 visitors using the area from July 2 through September 3, 1989 (Cross and Davis 1989). Total visitor use was estimated, from combined counter and interview data, as 7,930 visitors on trails during June 2 through September 11, 1999 with 5,700 visitors from July 2 through September 3, 1999 in the Great Gulf Wilderness. Thus, the 1999 visitor data indicates an approximate 28% reduction in visitor use over 1989 for the same time period.

The temporal distribution of wilderness recreational use is uneven with 1999 daily use increasing through the early season, reaching the highest use in July and August, and then decreasing in mid-September (figure 1). Also, there is a noticeable pattern of more recreational use on weekends than weekdays and the highest weekend use occurs on holiday weekends like July 4th and Labor Day (figure 1). However, when the data exclude the early and late season (e.g., Labor Day) then the differences between days of the week are not as strong a difference as it was in 1989; 1999 users are most similar to the patterns of use per day of the week as reported in 1976 (table 1).

Figure 1. Temporal distribution of recreational use on weekends (labeled above) and weekdays during June 2 through September 11, 1999 in the Great Gulf Wilderness.

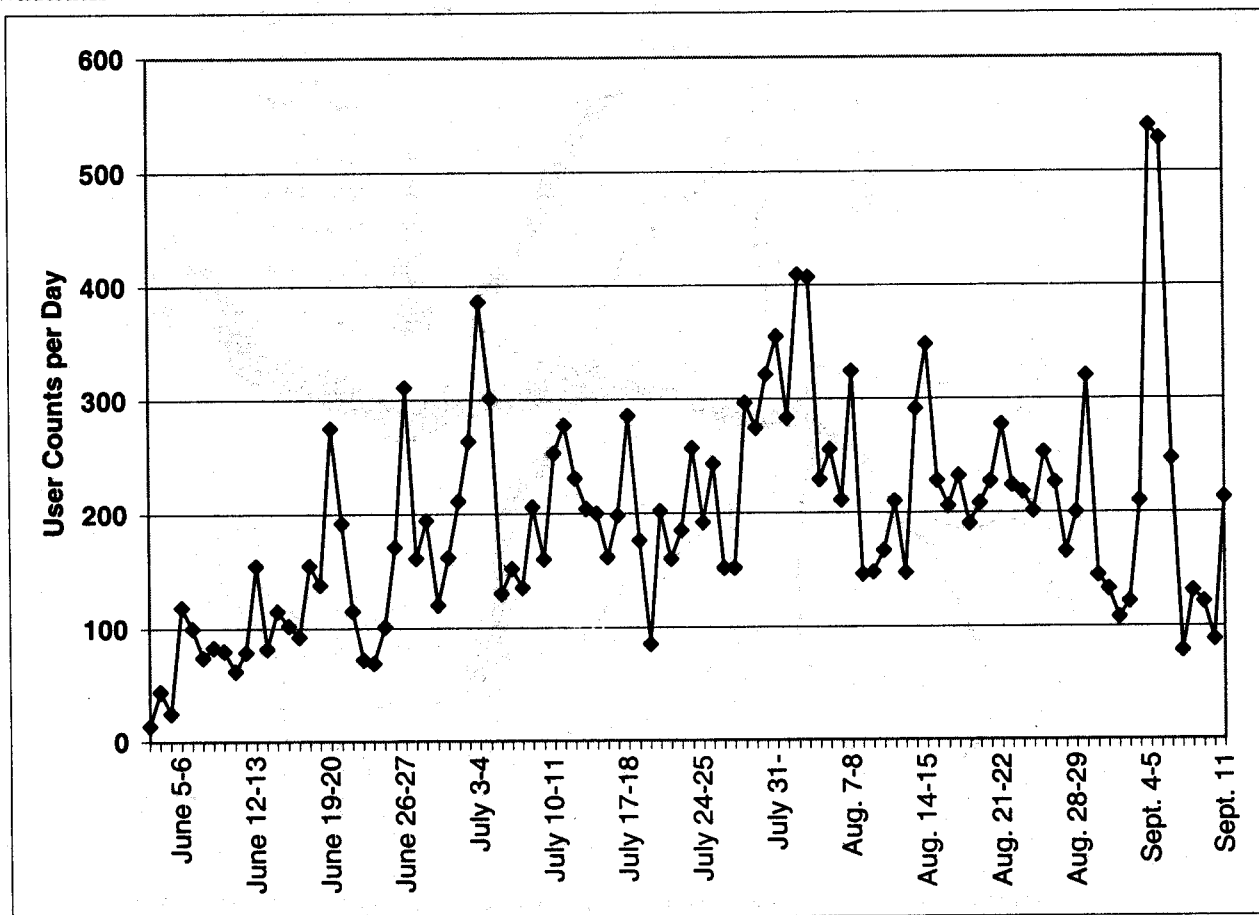


Table 1. Percent visitor entrances by day of week in 1976, 1989 and 1999 for the Great Gulf Wilderness from July 2 through September 3.

Day of Week	1976	1989	1999 ^a
Sunday	14.6	14.9	15.4
Monday	11.6	10.9	12.1
Tuesday	14.4	6.2	12.9
Wednesday	13.2	12.7	12.5
Thursday	13.1	14.9	12.5
Friday	14.7	15.6	16.1
Saturday	<u>18.4</u>	<u>24.8</u>	<u>18.5</u>
Total	100.0	100.0	100.0

Includes entrances and exits for 1999.

The geographical distribution of wilderness recreational use is similarly uneven with many people in a few places and relatively few in many other locations in the Great Gulf Wilderness (figure 2). For many reasons (e.g., ease of access, guidebook descriptions), some trailheads and popular destinations attract more use than others. Examples in the Great Gulf Wilderness include hikers following the Appalachian Trail through the area, day hikers going to a well known vista point (Lowe's Bald Spot), and the best parking area for wilderness

access being developed at one point off Route 16. The geographic concentration of use, when combined with the tendency for use to concentrate during the summer and high use weekends, can contribute to the perception of crowding among users. The tendency for a large percentage of users to access the Great Gulf Wilderness from the Great Gulf parking area on Route 16 is more evident in the 1999 study than the 1989 study (table 2).

Figure 2. Geographic distribution of recreational use during June 2 through September 11,1999 in the Great Gulf Wilderness.

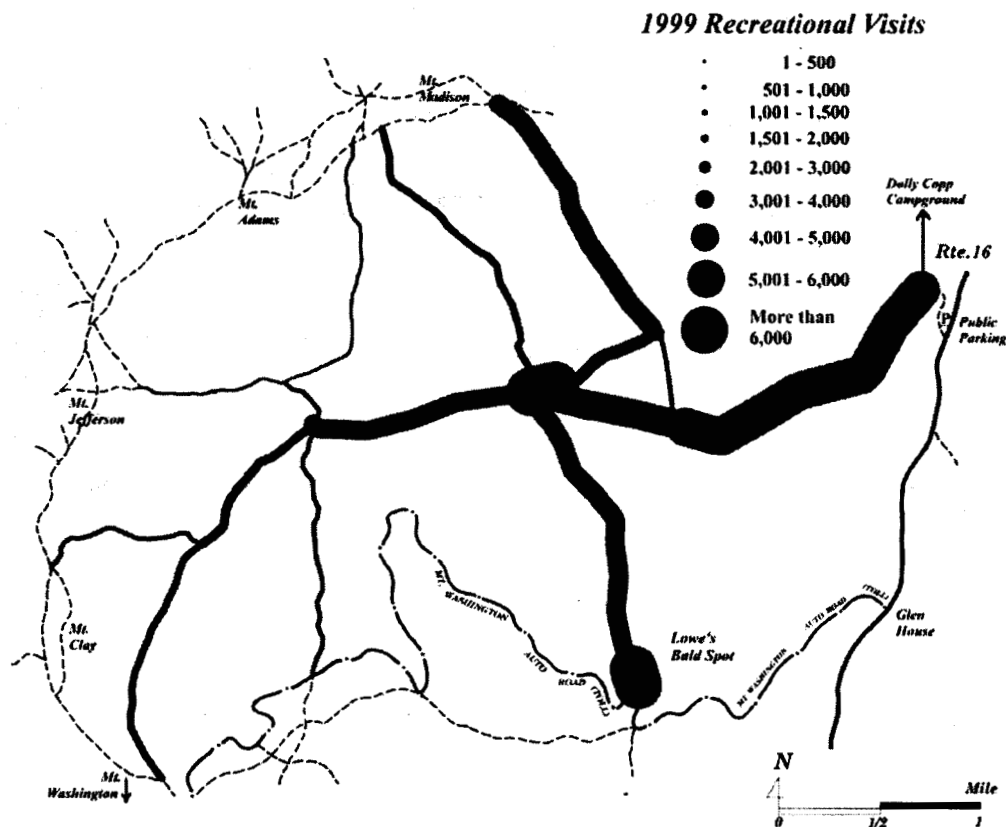


Table 2. Percentage of hiker entries based on trail interview data during July 1 through September 4, 1989 and June 2 through September 11,1999 in the Great Gulf Wilderness.

Entry Point	1989	1999
Great Gulf Parking (route 16)	34.3	55.2
Madison Gulf-Auto Road	25.2	22.3
Osgood Ridge	12.0	16.0
Dolly Copp Campground	9.1	0.0
Great Gulf Headwall	6.6	1.9
Wamsutta	3.0	2.5
Madison Gulf-Summit	3.0	1.2
Spinx trail	2.6	0.6
Buttress	2.4	0.0
Six Husbands	1.8	0.3
Total	100.0	100.0

Trips vary in length and most use is on the central Great Gulf Trail and Appalachian Trail or trails that branch out from those main trails. The same amount of use on every acre or of every mile of the trail system is not realistic nor desirable from either a user or a manager perspective for two reasons. First, different parts of a wilderness vary in their capacity to sustain use while maintaining good solitude and environmental conditions. Second, with evenly distributed use, users who really value solitude, and are willing to hike a long way to find it, would not be satisfied.

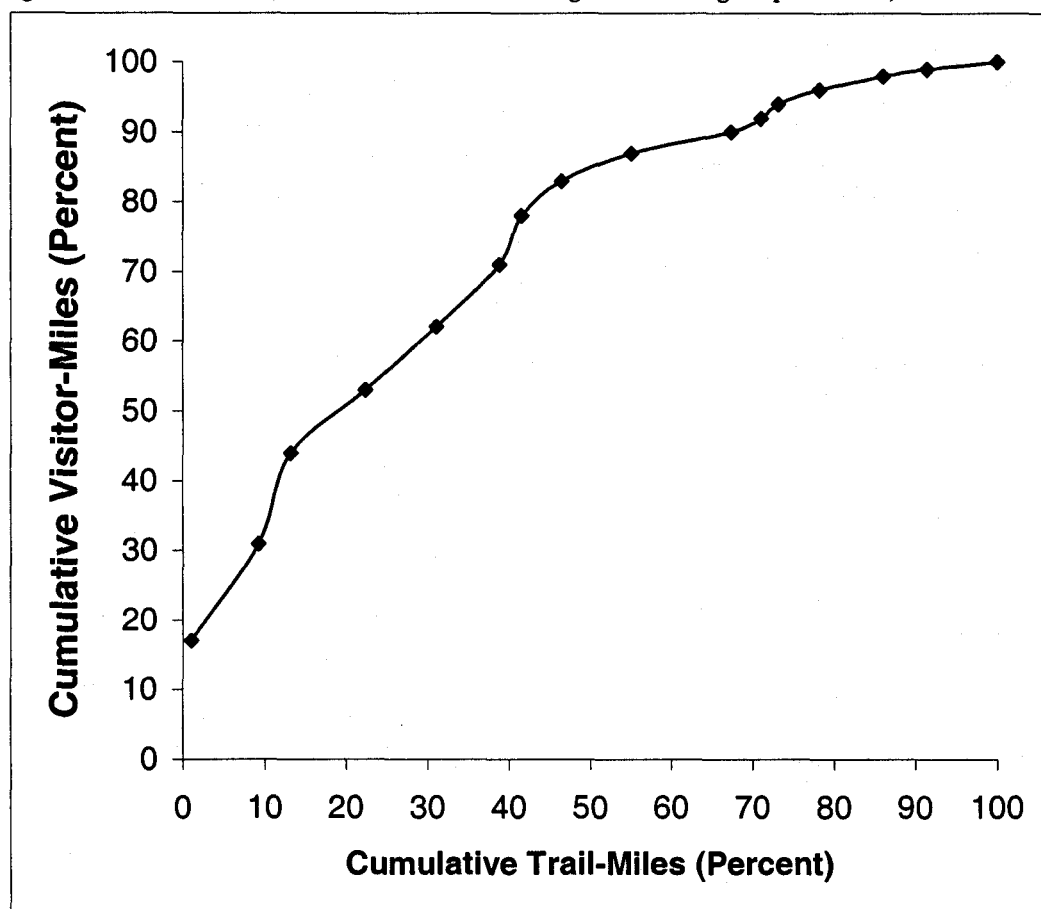
Estimates of visitor use, by themselves, provide little information regarding pressure on the resource because areas vary in size. Acreage and use figures can be expressed in terms of visitor-days per acre (about 2.4 in the Great Gulf in 1999), but such comparisons do not include adjustments for the length of use season nor the proportion of usable acreage. The 5,550 acre Great Gulf Wilderness has about 2 entry points per 1,000 acres and about 4.5 miles of trail per thousand acres. All wilderness acreage is available as a setting and space for solitude, but only a portion is used directly by visitors. The amount of land available for use in the Great Gulf is mostly affected by

steepness of slope and dense vegetation. Miles of trail per thousand acres and numbers of entry points per thousand acres may relate better to use capacity than does total wilderness area. Historically within the NWPS, the "Great Gulf Wilderness has about 60 times as many entry points per 1,000 acres and more than 8 times as dense a trail network as does the Teton Wilderness" (Hendee and others 1990).

Use distribution can vary both within and between wilderness areas of the NWPS. The 1999 use pattern in the Great Gulf Wilderness is representative of the uneven spatial distribution of use in many wilderness areas. The use data for the Great Gulf Wilderness indicates a pattern of uneven hiking use on some trail segments, particularly those associated with the Appalachian Trail and the summits of the Presidential Mountain range. The heavy concentration of use along only a few trail miles is shown in figure 3. Trail segments are ranked from the most to the least used. Total travel, in cumulative visitor-miles,

is graphed against cumulative trail miles. The percentage of total use concentrated on any proportion of the trail network can be seen in figure 3 — for example, 20 percent of the trail miles received 50 percent of all trail use in 1999 in the Great Gulf Wilderness. The trail use concentration index (from 0 to 100) measures how much of the curve is above the 45-degree diagonal, which represents an even use distribution along all trail miles. Higher index numbers mean the use is more concentrated. For example, in the Spanish Peaks, the use was relatively concentrated in 1970 (index number 53), but two larger areas reported (Lucas 1980) even more concentrated use; the Bob Marshall Wilderness had an index of 85 and the Selway-Bitterroot Wilderness had an index of 67. In 1999, the Great Gulf Wilderness had a concentrated index number of 48 (figure 3) which is moderately high for a small wilderness. This confirms the visual analysis of figure 2 which suggested that visitor use was concentrated on some trails more than others in the Great Gulf Wilderness.

Figure 3. Recreational use concentration on trails during June 2 through September 11, 1999 in the Great Gulf Wilderness.



Management Implications

The high concentrations of wilderness visitors in the Great Gulf Wilderness pose a challenge for managers. The tendency of recreation use to concentrate in time and space within the Great Gulf Wilderness provides management the opportunity to focus their efforts and resources on these locations and time periods. However, some of the alternative management approaches to

minimize impacts could be redirecting visitor use to other areas, dispersing some use within the area, limiting use on high use weekends, or rerouting the Appalachian Trail outside the Great Gulf Wilderness boundaries. The areas within the Great Gulf Wilderness probably vary in their capacity to absorb the social and environmental impacts of use and some of the most popular trails and destination locations (such as the riparian zones near streams and waterfalls) may be sensitive to physical impacts

from use and intrusions on solitude. Monitoring recreational visits over many years with trail counters and brief onsite interviews provides managers with some of the information necessary to make visitor management decisions.

The use of counters or interviews alone will provide limited information (e.g., total visits or trail segments used), but the two techniques together increase the value of the monitoring information and allow for simple comparative analyses that can be used over time or between different wilderness areas. Future use monitoring and user environmental impact research could be combined to evaluate campsite and trail condition changes within the Great Gulf Wilderness. Similarly, future use monitoring and user social impact research could be combined to evaluate solitude and user perceptions of crowding changes within the Great Gulf Wilderness.

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NEW ENGLAND'S TRAVEL & TOURISM MARKETS: TRENDS IN THE GEOGRAPHIC TARGET MARKETS IN THE 90'S

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Abstract: The purpose of this paper was to examine the travel and lifestyle activity market trends to New England in the 90s. The central theme was to fully examine in detail the primary, secondary and tertiary geographic markets targeted by New England destinations. Keywords: travel and tourism trends; activity trends; geographic markets; primary, secondary and tertiary geographic markets.

Introduction

The changing age and demographic shifts in the population age structure will one of the most important social phenomena of the 21st century (Kelly and Warnick, 1999). The shifts will have far reaching effects on society in general and in recreation and tourism markets specifically. Many will react to the demographic shifts by devising marketing strategies aimed ever more heavily at Baby Boomers and by diversifying into tourism attractions and programs that have traditionally appeal to middle-aged and older consumers. Each demographic group of people has distinct differences in travel-specific behavior and participation rates. On the other hand, many tourism agencies will focus those market strategies on highly targeted geographic or metro areas. For the geographic target tourism marketers, strategies will include market penetration and grabbing more market share. The different strategies and the approaches taken will depend upon the monitoring of changing trends within both the demographic and geographic markets. Participation rates will shape future demand and the monitoring of rates of participation and behavior and related changes within market areas will help to signal changing cycles and conditions in the tourism and recreation activity industries.

Recent studies (Warnick, 1992A and 1992B, 1993, 1996, 1999) indicated domestic travel in the Northeast and New England had become a mature market and finally showed signs of recovery in the mid-90s. New England, which is easily one of the nation's most definable regions, is a relatively compact region, close to the large megalopolis of east coast cities and a highly desirable geographic market to visit in most consumers' minds. New England's tourism and recreation attraction industry is very well defined and four of the six New England states possess significant tourism-based economies. Thus, careful monitoring of trends in activities by demographic and geographic markets is critical to these tourism-based economies. The 1999 study fully documented the demographic and behavior changes and will form the starting basis of this study, which concludes, with a more detailed examination of the

geographic markets targeted by New England's destinations.

Purpose of Study

The purpose of this study is to examine in detail the geographic markets targeted by New England destinations through the lifestyle and geographic profiling of the markets (i.e., the metro markets by geographic area -- the relative distance to New England destinations). The initial study (Warnick, 1996) on geographic markets covered the period only through the mid-90s and this study will update those findings.

Method

In previous studies, two databases were examined in order to more fully understand the travel trends to New England. These data sets included Simmons Market Research Bureau's *Study of Media and Markets* (1980 through 1996) and Standard Rate and Data Service's (SRDS) *Lifestyle Market Analyst* (1993 through 1996). With data now available through 1999, the line of research and trend analysis was updated and expanded through the SRDS data. These data provide activity patterns of geographic markets, which New England destinations would commonly target. For the purposes of this study, several statistic variables were used to describe the trends in these data.

The descriptive statistics used included an average annual adjusted percent change rate and a three-year moving average for the SRDS data. Participation rates and net market of households were used as primary variables to examine the overall trends. The trends analysis of the geographic target markets of New England based destinations, primary, secondary, and tertiary markets, was undertaken and the associated lifestyles within these markets were examined. Primary markets included those target market metro areas within a three-hour drive of the heart of New England (i.e., Boston, New York City). Secondary markets included those target metro areas within a three to six hour drive of New England (i.e., Philadelphia, Harrisburg). Tertiary markets include those target market metro areas in excess of six hours drive time (i.e., Baltimore, Washington). The metro areas within in each geographic market included: primary market -- includes geographic areas of Albany, NY; Bangor, ME; Boston, MA; Burlington, VT; Hartford/New Haven, CT; New York, NY; Portland/Auburn, ME; Providence/New Bedford, RI/MA; and Springfield, MA; secondary market -- includes the geographic areas of Philadelphia, PA; Scranton/Wilkes-Barre, PA; Harrisburg, PA; and Syracuse, NY; and tertiary market -- includes the geographic markets of Baltimore, MD; Cleveland, OH; Pittsburgh, PA and Washington, DC. When referring to these markets (primary, secondary and tertiary) collectively throughout this study we will refer to them as the Northeast market area. Activity clusters for each geographic market were grouped into travel, recreation and sport, outdoor recreation, fitness and cultural/heritage markets. The travel market lifestyle includes activities of domestic travel (100 miles or more, overnight) and vacation travel. The recreation and sport market lifestyle includes activities of

golf, tennis, skiing and bicycling. The outdoor recreation lifestyle includes activities of interest in wildlife and environment, hiking and camping, hunting and shooting, and fishing. The physical fitness lifestyle includes activities of fitness walking or walking for health and fitness programs. The cultural and historic interests lifestyle includes activities of attending cultural/arts events and interests in our nation's heritage. These targeted metro or geographic market areas for New England destinations were examined to determine if changes in these lifestyle interests had occurred from the period of 1995 through 1999. The lifestyle interests within these markets were compared to the overall market area (a within market area analysis, i.e., metro areas within the primary markets were compared for example), to the national market and to the entire region examined (e.g., the primary, secondary and tertiary geographic markets combined or the Northeast market area). Trends were identified on a change scale of strong decline (decline of 2% or more per year); decline (0 to -2% per yr); no growth (at or near 0% per year); stable (positive, but less than 2% per year); growth (2% to 4% per year) and strong growth (>4% per year) during the 1995 through 1999 period. SRDS data is presented as household participation data and they present their information as a three-year moving average. So, data from 1995 is an average of data from 1993, 1994, and the new year 1995 and so on for each new year.

Selected Findings

A detail analysis of the New England destination travelers with tables may be found in the 1999 NERR Proceedings; they provide an overview of who travels to New England and what their activity interests and motivations for travel are. For detailed information and tables see Warnick, 1999. "The New England Travel Market: An Update of Changing Demographic and Geographic Markets, 1980 to 1996." *1999 Proceedings of the Northeast Recreation Research Conference*. Bolton Landing, New York. General Technical Report N-269. Radnor, PA Northeast Forest Experiment Station. pp. 134-140. The findings here reveal what people within the target markets do and how these markets are changing.

Insights into the geographic markets may be obtained by examining the markets which New England destinations target geographically. Here we have grouped the findings into travel markets, sports and recreation, outdoor recreation, fitness activities and interest in cultural and history/heritage events by primary, secondary and tertiary markets of New England.

Travel Lifestyle Activity by Geographic Markets. In the previous studies, travel was found to be declining, although

the travel patterns were still higher than the national averages. In this study, the best of both worlds has been realized in travel market activities. Domestic travel has remained stable and vacation travel has increased. Table 1 contains the participation and trend data for travel and vacation travel.

Domestic Travel Lifestyle. New England's primary markets were overall stable for domestic travel. Which metro areas showed the strongest growth trends in travel? Albany, NY; Bangor, Maine; Boston, Massachusetts; and Portland/Auburn, Maine grew at rates exceeding 4% per year. Metro areas with the highest participation rates for travel were Boston and Hartford/New Haven. Both held travel rates of 40.2%, which are above the national and overall regional market rates. New England's secondary market was strong with overall travel rates at about the national rates. Philadelphia and Harrisburg, Pennsylvania were strong growth markets for travel. Scranton-Wilkes Barre, PA, no growth market, and Syracuse, NY, a decline market, were less promising markets for New England. The tertiary markets also exhibited strong growth trends for travel with rates exceeding national rates. Baltimore, Maryland (38.3%) and Washington, DC (40.6%) held the most promise. Washington held the highest participation rate for household travel of all of the markets examined here and held strong growth patterns. This travel includes all types of travel of 100 miles or more away from home. A better indicator for tourism travel is "vacation travel" as collected by SRDS. Rates are typically higher here and although not clear in the data collection process, these data likely reflect more regional based travel, which may not exceed the common "100 miles away from home" criteria often used in travel studies.

Vacation Travel Lifestyle. The national vacation travel market increased in excess of 4% per year by households during this period and the regional participation rate for vacation travel was higher for the Northeast (46.6% of all households participated in vacation travel) than the national rate, which was 45%. Within New England's primary markets, all metro areas held strong growth trends, in excess of 4% per year, with the exception of Providence/New Bedford and Springfield, Massachusetts where the trend changes were less. Boston (49.1%) and New York City (47.3%) held the highest household participation rates for vacation travel in this portion of the total market area. New England's secondary market was strong with overall vacation travel rates slightly above the national rate. Philadelphia and Harrisburg, Pennsylvania were the strongest growth markets for vacation travel in this market area. Scranton-Wilkes Barre, PA and Syracuse, NY were stable market with some growth but less than 2% per year. All of the tertiary market area exhibited strong growth patterns from 1995 through 1999 for vacation travel. Baltimore (46.4%) and Washington, DC (47.3%) were the strongest.

Table 1. Travel patterns for New England destination markets for 1999 with trends for 1995-1999.

	<u>Travel</u>	<u>Travel Trend</u>	<u>Vacation Travel</u>	<u>Vac. Travel Trend</u>
National Rates	37.9%	G	45.0%	SG
All New England Markets	39.0%	S	46.6%	SG
<i>Primary Markets:</i>	39.4%	S	47.1%	SG
Albany	38.3%	SG	45.5%	SG
Bangor	34.1%	SG	41.9%	SG
Boston	40.2%	SG	49.1%	SG
Burlington/Plattsburgh	36.4%	G	41.9%	SG
Hartford/New Haven	40.2%	S	39.5%	SG
New York City Metro	39.8%	S	47.3%	SG
Portland/Auburn	36.4%	SG	42.3%	SG
Providence/New Bedford	37.5%	S	45.0%	G
Springfield	36.0%	S	43.2%	S
<i>Secondary Markets:</i>	37.9%	SG	45.8%	SG
Philadelphia	39.0%	SG	47.3%	SG
Scranton-Wilkes Barre	34.1%	NG	41.4%	S
Harrisburg, PA	36.8%	SG	43.2%	SG
Syracuse, NY	37.5%	D	45.0%	S
<i>Tertiary Markets:</i>	38.8%	SG	46.0%	SG
Baltimore	38.3%	SG	46.4%	SG
Cleveland	39.4%	G	46.4%	SG
Pittsburgh	36.0%	S	43.2%	SG
Washington, DC	40.6%	SG	47.3%	SG

Key: SD=Strong Decline (>-2%/yr). D=Decline (>0 to -2%/yr). NG= No Growth (at or near %/yr). S=Stable (positive, but less than 2%/yr). G=Growth (2% to 4%/yr.). SG=Strong Growth (>4%/ yr).

Recreation and Sport Lifestyle Market Activity by Geographic Markets. Of these four activities, the activity with the strongest growth during this period was biking. Nearly 21% of all households in the total market area participated and the growth trend exceeded 4% per year. The rate was about equal to the national participation rate for the activity. Tennis enjoyed a rebound in the Northeast market with a strong growth pattern and rates that exceed the national rates for the activity. Household participation rates for tennis were 6.8% nationally and 8.0% for the Northeast regional markets. The rates for skiing exceeded the national rates, but the growth was not as strong as the national trends. Growth in household participation for skiing was up over 4% per year at the national level. Household participation rates for skiing were 8.3% nationally and 9.6% for the Northeast regional markets. Surprisingly, the household rate for golf did not grow as rapidly as in early portions of the decade in the Northeast. Nationally, golf has enjoyed a strong growth trend in the late 90s. Household participation rates for golf were 21.2% nationally and 19.9% for the Northeast regional markets. Recreation and sport lifestyle markets may be found in Table 2.

Golf Lifestyle. The rates were slightly lower than the national participation rates for golf in this region and the trend pattern was only about 2-4% growth per year. Most all of the markets within this area grew only slightly or were stable. However,

substantial variation exists within the metro area for the game of golf. While Albany, NY (23.1%); Boston (22.5%), and Hartford (22.7%) household participation rates were higher than the national average (21.2%) for golf, the trends within these markets were stable to moderate in growth. Other markets, Portland (18%) and Bangor (16.1), Maine had rates below the national and regional rates even though the markets were growing. Overall, the secondary and tertiary markets are more active golf markets with several of these metro markets holding rates in excess of 20% (Syracuse, NY-25.9%; Cleveland, Ohio-26.1%; and Pittsburgh, Pennsylvania-22.9%). However, none of those other areas exceeded growth rates for golf of more than 4% per year. Cleveland and Pittsburgh experience no growth during the 1995 to 1999 period. Still, next to biking, this activity enjoys the highest household participation rates of the four activities examined.

Tennis Lifestyle. Tennis, which has traditionally held strong rates in the Northeast, has indeed rebounded in the last half of the 90s. While the rates have not increased to those of the 70s and early 80s, the trends here indicate strong growth nationally and in the Northeast market areas. The Northeast market metro areas held rates that are higher than the national averages and several are growing at rates exceeding 4% per year. Much of the growth in tennis may be fuel by the New York City metro area with a household participation rate of 9.4% and a strong growth

trend exceeding 4% per year. Boston is also a good tennis market with a household rate of 8.4%, but it only experienced moderate growth. Providence/New Bedford (7.1% participate) experienced a strong growth trend for tennis. Hartford/New Haven has a high participation rate, but the growth trend was moderate. Of the secondary markets, Philadelphia has the highest participation rate for tennis (7.7%) while the growth trend is only moderate. Scranton/Wilkes Barre (4.2%) and Syracuse (5.7%) have lower rates but strong growth trends. The strongest tertiary market for tennis is Washington with a strong growth trend pattern and a household participation rate of 9.3%. All other tertiary markets are either stable or moderate growth markets for tennis.

Bicycling Lifestyle. Biking now comes in many different forms; however, across the board in the Northeast all markets are growing and the rates are near or exceed the national averages. All primary, secondary and tertiary markets are growing. Primary metro areas with high bicycling rates include Springfield, Massachusetts and Burlington, Vermont; however, six of the nine areas have rates in excess of 22%. The overall rates in the secondary markets are not as high. Philadelphia (20.2%) and Syracuse (21%) are highest here. In the tertiary markets, Washington has the highest rate of 21.6% and Pittsburgh the lowest with only 16% participating.

Table 2. Recreation and sport activity rates for New England destination markets for 1999 with trend of 95-99.

<i>Markets:</i>	<u>Golf</u>	<u>Trend</u>	<u>Tennis</u>	<u>Trend</u>	<u>Ski</u>	<u>Trend</u>	<u>Bike</u>	<u>Trend</u>
National Rates	21.2%	SG	6.8%	SG	8.3%	SG	20.8%	SG
All NE. Mkts	19.9%	G	8.0%	SG	9.6%	G	20.7%	SG
<i>Primary Markets</i>	18.9%	G	8.6%	G	11.0%	G	21.6%	SG
Albany	23.1%	S	6.5%	G	13.1%	NG	22.0%	SG
Bangor	16.1%	G	4.8%	SG	12.1%	NG	19.3%	SG
Boston	22.5%	G	8.4%	G	14.7%	G	22.7%	SG
Burlington/Plattsburgh	19.3%	S	6.4%	G	20.0%	NG	24.5%	SG
Hartford/New Haven	22.7%	S	8.0%	G	11.0%	NG	20.4%	SG
New York City Metro	17.0%	G	9.4%	SG	9.0%	G	21.2%	SG
Portland/Auburn	18.0%	G	5.8%	G	15.6%	NG	22.3%	SG
Providence/New Bedford	20.4%	G	7.1%	SG	10.4%	G	22.3%	SG
Springfield	21.0%	NG	6.2%	G	10.2%	D	23.1%	SG
<i>Secondary Markets</i>	20.1%	S	6.7%	G	8.1%	G	19.2%	SG
Harrisburg, PA	20.6%	G	5.6%	G	6.4%	G	17.3%	SG
Philadelphia	19.7%	G	7.7%	G	8.3%	G	20.2%	SG
Scranton-Wilkes Barre	17.4%	S	4.2%	SG	7.0%	S	15.2%	SG
Syracuse, NY	25.9%	S	5.7%	SG	10.5%	D	21.0%	SG
<i>Tertiary Markets</i>	21.6%	S	7.5%	SG	7.6%	G	20.0%	SG
Baltimore	18.4%	G	7.8%	SG	7.9%	G	20.2%	SG
Cleveland	26.1%	NG	5.5%	SG	6.0%	G	20.8%	SG
Pittsburgh	22.9%	NG	4.8%	G	6.7%	S	16.0%	SG
Washington, DC	19.1%	G	10.5%	SG	9.3%	SG	21.6%	SG

Key: SD=Strong Decline (>-2%/yr). D=Decline (>0 to -2%/yr). NG= No Growth (at or near %/yr). S=Stable (positive, but less than 2%/yr). G=Growth (2% to 4%/yr.). SG=Strong Growth (>4%/ yr).

Outdoor Recreation Lifestyle Market Activity by Geographic Markets. Of these four activities (interest in wildlife and the environment, camping/hiking, hunting and fishing), the activity with the strongest growth during this period was fishing. Nearly 29% of all households in the U.S. fish and the growth trend exceeded 4% per year from 1995 to 1999. Both fishing and camping/hiking were strong growth markets in the Northeast from 1995 to 1999, each exceeded a growth rate of 4% per year; however, in both activities the household participation rates were below the national rates. Before one jumps to conclusions on these activities, it was clear that there

was wide variability within the metro areas markets in the Northeast. For example, the rates for camping and hiking topped 41.5% in Bangor, Maine and only 15% in the New York City metro area. Similar patterns of wide variability were also found in hunting and fishing. After years of growing interest in wildlife and the environment, the rate of interest both nationally (15.5%) and within the overall Northeast market (15.5%) have declined. However, the decline was less than 2 % per year. For interest in camping and hiking, the Northeast enjoyed strong growth trends with an overall household participation rate of 20.6% compared to the national average of 26.8%. Hunting

enjoyed a stable pattern of activity during the 1995 to 1999 period both nationally and in the Northeast. The national rate was 16.6% and in the Northeast 11.3%. Although rates are far below the national participation rates, the stability and moderate growth in selected markets helped to maintain the overall market

interest. Although the fishing rates for the overall region held strong growth trends, the household rate for the Northeast (21.3%) is still below the national rate (28.8%). Participation rates and trends for the outdoor recreation activities may be found in Table 3.

Table 3. Outdoor Activity Rates for New England destination markets for 1999 with trend of 95-99.

<i>Markets:</i>	<u>Wildlife</u>	<u>Wildlife</u> <u>Trend</u>	<u>Camp/Hike</u>	<u>Camp/Hike</u> <u>Trend</u>	<u>Hunt</u>	<u>Hunt</u> <u>Trend</u>	<u>Fish</u>	<u>Fish</u> <u>Trend</u>
National Rates	15.5%	D	26.8%	G	16.6%	S	28.8%	SG
All NE. Mkts	15.6%	D	20.6%	SG	11.3%	S	21.3%	SG
<i>Primary Markets</i>	15.9%	SD	19.9%	SG	9.2%	S	19.8%	G
Albany	18.3%	D	30.3%	SG	17.3%	S	25.6%	SG
Bangor	22.6%	S	41.5%	SG	30.9%	S	40.3%	SG
Boston	16.3%	D	24.1%	SG	8.6%	S	19.6%	SG
Burlington/Plattsburgh	21.1%	D	37.8%	SG	26.2%	S	32.3%	SG
Hartford/New Haven	15.7%	D	22.8%	SG	9.8%	S	21.3%	SG
New York City Metro	15.0%	D	15.0%	SG	6.8%	NG	17.3%	SG
Portland/Auburn	20.3%	D	36.7%	D	21.4%	S	31.7%	D
Providence/New Bedford	15.0%	SD	21.2%	SG	8.1%	G	21.0%	SG
Springfield	17.2%	D	26.3%	SG	12.8%	G	23.9%	SG
<i>Secondary Markets</i>	15.9%	SD	21.4%	SG	15.1%	S	23.7%	SG
Harrisburg, PA	16.6%	D	26.0%	SG	22.2%	D	25.6%	SG
Philadelphia	15.0%	SD	18.2%	SG	10.6%	S	21.3%	SG
Scranton-Wilkes Barre	16.9%	S	25.5%	NG	25.7%	D	30.2%	D
Syracuse, NY	19.1%	S	30.3%	SG	18.8%	NG	28.8%	SG
<i>Tertiary Markets</i>	14.7%	SD	21.7%	SG	13.6%	S	22.8%	SG
Baltimore	15.7%	SD	20.1%	SG	11.0%	S	21.0%	SG
Cleveland	14.3%	SD	23.3%	SG	12.6%	NG	24.8%	SG
Pittsburgh	14.3%	SD	22.5%	SG	20.8%	S	25.3%	SG
Washington, DC	14.9%	SD	20.9%	SG	11.5%	S	20.2%	SG

Key: SD=Strong Decline (>-2%/yr). D=Decline (>0 to -2%/yr). NG= No Growth (at or near %/yr). S=Stable (positive, but less than 2%/yr). G=Growth (2% to 4%/yr). SG=Strong Growth (>4%/yr).

Interest in Wildlife & Environment. The household participation rate (15.6%) for interest in the environment and wildlife in the Northeast overall market was about the same rate as the national rate (15.5%); but both nationally and regionally the interest has declined. Nearly all metro areas in the Northeast experienced a decline in interest in this activity (14 of 17 areas declined) with one metro area in the primary (Providence/New Bedford) and secondary (Philadelphia) markets experiencing strong decline of more than 4% per year. All of the tertiary markets experienced the same level of declining interest. Still, all but two metro areas (Providence/New Bedford and New York City) had rates above the regional and national rates for the activity. Scranton-Wilkes Barre and Syracuse were stable markets, but Harrisburg and Philadelphia declined. Three of four tertiary markets held rates that were lower than national or regional averages and all four markets declined strongly, more than 4% per year. While metro markets also do vary substantially and are declining; in 10 of 17 metro areas the rates

of interest in wildlife and environment are still above the national rate.

Camping/Hiking Lifestyles. In 14 of the 17 metro areas, strong growth patterns in participation for camping and hiking occurred. Only Portland, Maine (36.7%) and Scranton-Wilkes Barre (25.5%) held decline or no growth trends, but both areas held above average rates during the period. Overall, the primary market area for camping and hiking is in a strong market growth trend. While the small metro areas have higher participation rates, 8 of 9 experienced strong growth. Rates varied widely within the region, too. New York held a 15% rate while Bangor, Maine a 41.5% rate. The secondary market area found one market area with above average participation rates (Syracuse, 30.3%), but three of the four held patterns of strong growth. The rates were lower than the other regional and national averages in all of the tertiary markets, but each market held growth trend patterns above 4% per year.

Hunting Lifestyles. Hunting probably held the most variability of any activity when the metro areas were examined. For example, Bangor, Maine held a participation rate of 30.9% that was stable compared to New York City with a rate of 6.8% and no growth. Overall, the primary market was found to be stable. Six of the metro areas had stable participation rates for hunting. Moderate growth was found in two markets – Providence/New Bedford (8.1%) and Springfield, Massachusetts (12.8%). The New York City metro area experienced no growth during this period. Bangor, Maine (30.9%); Burlington, Vermont (26.2%) and Portland, Maine (21.4%) held the highest participation rates for hunting in the primary market area. In the secondary market area, the overall market trend was stable. However, variation within these markets was also substantial. One market actually grew, Philadelphia, but it held only a 10.6% participation rate. Two markets, Harrisburg (22.2%) and Scranton-Wilkes Barre (25.7%) actually declined, but their rates were twice that of Philadelphia. Syracuse possessed a no growth change pattern. Finally, three of the tertiary markets held a stable trend pattern -- Baltimore (11.0%), Pittsburgh (20.8%) and Washington, DC (11.5%) while Cleveland (12.6%) experienced no change in participation trends for hunting. No metro areas experienced strong growth for hunting during this period.

Fishing Lifestyles. Fifteen of the 17 metro markets held strong growth patterns during the period. In the primary market, nearly all markets held high growth rates for fishing. Only the Portland, Maine market declined. Rates for fishing varied widely in the primary market. Rates were highest in Bangor (40.3%) and Burlington (32.3%) and lowest in Boston (19.6%) and New York City (17.3%). In the secondary markets, the overall trend was strong growth with only Scranton-Wilkes Barre declining in participation rates. Harrisburg (25.6%) and Syracuse (28.8%) exceeded the regional participation rate (21.3%). All of the tertiary markets held strong growth trends for fishing. Pittsburgh (25.3%) had the highest participation rate in this area.

Fitness Lifestyle Market Activity by Geographic Markets. Both of these activities (fitness walking and fitness/exercise programs) maintained stable trends patterns. Nearly 37% of all households in the U.S. engage in fitness walking and 36%

participate in a fitness/exercise program in 1999. All of the markets, primary, secondary and tertiary held stable activity interest for both activities. Participation rates varied only slightly between metro areas.

Fitness Walking Lifestyles. In the primary markets, 8 of the 9 markets actually grew; however New York, which held the lowest participation rate of 37.3%, remained stable during the period. In the secondary markets, Syracuse (39.1%) had the highest participation rates and the strongest growth trend. Philadelphia (37.3%) and Harrisburg (37.3%) were growth markets and Scranton-Wilkes Barre (39.1%) was stable. In the tertiary markets, Baltimore (36.5%) and Washington DC (35.8%) grew and Pittsburgh (39.1%) and Cleveland (36.2%) were stable.

Fitness/Exercise Program Lifestyle. Overall, the Northeast (37.8%) market held participation rates higher than the national rate (36.2%) and each of the market areas within the Northeast; the primary, secondary and tertiary; experienced stable patterns of change. Each of the market areas was stable. Within the primary market, both Portland, Maine (35.8%) and Providence/New Bedford (37.3%) were growth markets. All others were stable. Boston (39.8%) held the highest participation rate for fitness programs. In the secondary markets, Harrisburg (33%) and Scranton-Wilkes Barre (29.7%) grew and Philadelphia (37.6%) and Syracuse (34.4%) were stable. Philadelphia held the highest participation rate. In the tertiary markets, all metro areas were stable. Washington, DC (43.4%) held the highest participation rate. Table 4 contains these data.

Cultural Activity and History/Heritage Interest Activity by Geographic Markets. Of these two activities, interest in cultural activities grew the most, but interest in history and heritage experienced moderate growth (less than 2% growth). Nearly 17% of all households in the U.S. showed interest in cultural activities and nearly 6% expressed interest in history and heritage. The rates in the Northeast overall were higher for cultural activities (19.3%). Rates for interest in history and heritage were only slightly lower in the Northeast (5.7%). See Table 4 for these data.

Table 4. Fitness and Cultural/Historic Activities for New England destination markets for 1999 with trend of 95-99.

<i>Markets:</i>	<u>Fitness</u>	<u>Fit Walk</u>	<u>Fit/Exer</u>	<u>Fit/Ex.</u>	<u>Cult.</u>	<u>Cult.Act.</u>	<u>Hist. &</u>	<u>Hist.</u>
	<u>Walk</u>	<u>Trend</u>	<u>Trend</u>	<u>Trend</u>	<u>Activity</u>	<u>Trend</u>	<u>Heritage</u>	<u>Herit. Trd</u>
National Rates	36.9%	S	36.2%	S	16.7%	SG	5.5%	G
All NE Mkts	37.2%	S	37.8%	S	19.3%	SG	5.7%	G
<i>Primary Markets</i>								
	37.8%	S	38.3%	S	20.3%	SG	5.5%	G
Bangor	42.4%	G	32.2%	S	13.2%	SG	5.9%	SG
Portland/Auburn	41.7%	G	35.8%	G	15.7%	SG	6.3%	SG
Boston	41.0%	G	39.8%	S	20.2%	SG	5.8%	SG
Burlington/Plattsburgh	40.2%	G	35.1%	S	16.2%	SG	6.5%	SG
Albany	40.2%	G	35.1%	S	17.0%	SG	6.4%	G
Springfield	40.2%	G	35.8%	S	16.4%	G	5.2%	G
Hartford/New Haven	39.9%	G	38.4%	S	19.0%	SG	5.3%	G
Providence/New Bedford	42.8%	G	37.3%	G	16.9%	SG	5.0%	S
New York City Metro	37.3%	S	38.7%	S	21.7%	SG	5.4%	G
<i>Secondary Markets</i>								
	36.9%	S	35.7%	S	16.4%	SG	5.8%	G
Harrisburg, PA	37.3%	G	33.0%	G	14.9%	SG	6.4%	G
Philadelphia	37.3%	G	37.6%	S	17.9%	SG	5.7%	G
Scranton-Wilkes Barre	39.1%	S	29.7%	G	11.7%	SG	5.5%	S
Syracuse, NY	39.2%	SG	34.4%	S	16.0%	SG	5.8%	G
<i>Tertiary Markets</i>								
	35.9%	S	38.2%	S	19.2%	SG	6.0%	G
Baltimore	36.5%	G	37.3%	S	19.4%	SG	6.2%	SG
Washington, DC	35.8%	G	43.4%	S	23.5%	SG	7.0%	G
Pittsburgh	39.1%	S	33.7%	S	15.9%	SG	5.3%	G
Cleveland	36.2%	S	35.8%	S	16.0%	SG	5.1%	S

Key: SD=Strong Decline (>-2%/yr). D=Decline (>0 to -2%/yr). NG= No Growth (at or near %/yr). S=Stable (positive, but less than 2%/yr). G=Growth (2% to 4%/yr.). SG=Strong Growth (>4%/ yr).

Cultural Activity Lifestyles. In the primary markets, 8 of the 9 markets actually grew more than 4% per year (strong growth) for cultural activity interest. Interest was strongest in Boston (20.2%) and New York City (21.7%). Strong growth of more than 4% was also experienced in all of the secondary and tertiary markets for cultural activities. Rates were highest in Philadelphia (17.9%) and Syracuse (16%). In the other markets, Washington, DC (23.5%) and Baltimore (19.4%) held the highest interest in cultural activities.

History and Heritage Interest Lifestyle. In the primary market, four areas, Bangor, Portland, Boston and Burlington all experienced strong growth trends. Philadelphia and Harrisburg were growth markets and Scranton-Wilkes Barre was stable. In the tertiary markets, Baltimore and Washington DC grew and Pittsburgh and Cleveland were stable.

Conclusions and Implications

Earlier studies indicated that the New England travel markets had rebounded in the mid- to late 90s. However, the areas targeted by New England destinations revealed further trends in the market. The *SRDS Lifestyle Market Analyst* provides an excellent source of secondary data

about these markets. In this study, we were able to group New England's markets into primary, secondary and tertiary areas. Findings from these markets provide additional insights into the markets and trends within them.

The Simmons data, which formed the baseline data about New England destination travelers, are usually dated and do not provide a representative sampling of the typical metro areas targeted by tourism destinations. However, advancements in the data did provide opportunities for more directed analysis of the New England destination travelers. The SRDS data provide current up-to-date market data on regional metro areas throughout the Northeast. The data are current and because yearly data are provided, trend analysis is possible. The data are usually inexpensive and readily available at major university libraries.

Data collected and analyzed here provide information on grow, stable and decline activities. We found that travel, and particularly vacation traveled had in fact increased. Broad cross sections of activities were examined by three major market areas. In these markets, we attempted to determine where the active tourism markets resided, and

what do they do? How large is the market and what is the trend in the market area?

Some interesting new findings were documented in this study. For the travel markets, the target areas were stable for domestic travel, but vacation travel had strong growth patterns. Tennis and bicycling held strong growth patterns in the focused market areas. Golf continued to grow, but at a slightly slower pace. Downhill skiing enjoyed a higher than national participation rate in the primary markets and the markets did continue to grow moderately. For outdoor recreation, we found surprisingly that interest in the environment and wildlife had declined across all markets while interest in camping, hiking and fishing held strong growth pattern changes. Furthermore, variability in these activities and markets offered widely different market conditions. The fitness markets were stable and interest in cultural activities and interest in history and cultural activities continued to grow in interest.

However, one should note that the information collected through the SRDS data do not indicate if these markets either have or actually will travel to New England. The link to activity participation and travel is only an association. There are no links in the data to actually know where the households traveled only that they did take domestic or vacation travel trips in the last year. One would expect that the associations are strong. People who travel on vacation are likely to go on trips, which are within a reasonable distance from home. While there may be a likelihood that a portion of this travel was to New England, one cannot be conclusive on this assumption. This is a significant limitation to these data although this is overcome in the Simmons data. Furthermore, data in the SRDS only highlight the number of households and participation rates and do not address the volume of participation or actual number of trips taken.

The insights from taking the two data sets together and examining the results provide us even more thorough understanding of the New England travel market. For example, we know that the New England destination traveler is a highly active outdoors type and a large portion of the New England destination travelers are individuals who travel frequently. We now know that over 40% of all New England based travelers take four or more trips per year. Furthermore, we now know that travel to New England is much more dispersed than one might be perceived. For example from Simmons we found that 41% of the New England destinations travelers take trips in May through August and another 17% come during the fall foliage season - September and October. When these findings are combined with a look at the target markets regions - primary, secondary and tertiary, we more fully understand where the markets may actually exist. We know that the vacation travel market is strong and that the primary markets have the highest participation rates. Furthermore we know that 8 of 10 metro markets in the primary target region are going at rates greater than 4% per year. Knowing that New England based travelers participate at levels well above national participation rates for selected sport and outdoor recreation activities, we can also target these markets.

In other activities, it was clear that some markets are changing and great differences exist between major metro areas and smaller areas. For example, we found that interest in the environment and wildlife had slowed over the last half of the decade. On the other hand, other significant differences existed. For example, in hunting and fishing, household participation rates in Bangor, Maine (the rate for hunting was 30.9% and for fishing 40.3%) were more than twice the rate of the New York City metro area (hunting rate - 6.8% and fishing rate - 17.3%).

Within recreation, travel, sport and cultural activity markets more insights were gained by examining the geographic markets where people live. New England destination travelers are from active households. This research tells both where they are likely to come from but also if those same markets are growing, are stable or are declining within these lifestyle pursuits. This review of New England destination travelers and their respective markets further enhances our understanding of the market potential of the Northeast and opportunity to attract those potential travelers. We also see that the markets are changing. A simple review of national and even regional trends and activity patterns can be misleading unless one examines carefully each of the individual markets. These markets are dynamic, some drastically different and ever changing. This monitoring of trends and activities by markets will continue to be necessary if New England is to maintain its status as a major destination tourism region.

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Founder's Forum

NOTES ON MY TRIP THROUGH NEBRASKA, OR SOME ALTERNATIVE MARKETING PRINCIPLES FOR PARKS AND RECREATION

Alan R. Graefe
The Pennsylvania State University

I started working on this talk on December 19th last year. That was the day I began my trip home from Colorado at the end of my fall semester sabbatical. While traveling through Nebraska I started seeing things that I just couldn't believe. Not just a single thing, but one thing after another. This had to be an omen. I knew immediately that I had found the topic for my Founder's Forum presentation.

I was going to call this the highlights of my trip through Nebraska, but that title was already taken (it was included on the list of shortest books ever written). Let's just call it, Notes on My Trip Through Nebraska, or Some Alternative Marketing Principles For Parks And Recreation.

I saw Nebraska's scenic overlook – yes they have one, on I-80 near the western border of the state. Didn't stop there, neither did anyone else. I think it's because you already have a pretty good view of the whole field from the highway. In fact after hours of uninterrupted views of the field that is Nebraska, you don't need a scenic overlook.

This observation was validated after my return when I went on the internet to look up Nebraska. Sure enough, there was a web-camera offering uninterrupted live views of, you guessed it, a field in Nebraska.

So, what are some of the tourist attractions in Nebraska? They include:

- *Buffalo Bill ranch*
- *Cabela's factory outlet (this one really did draw a crowd)*
- *Pony Express statue*
- *Omaha, home of Omaha steaks, where you can get four 5 ounce steaks for \$50.00, or is it five 4-ounce steaks. What difference does it make; they're too small anyway and certainly fairly low on the value scale.*

But the number #1 attraction in Nebraska is . . . *Pioneer Village*

How do I know? From the many signs advertising this fact. We'll come back to this later.

Do you know there is an actual sign on I-80 in Nebraska that says: (I'm not making this up)

*Monument Ahead
Do Not Stop or Slow Down*

This was followed by numerous signs warning you of the amount of fine for stopping or slowing down (\$100), and an enormous London Bridge-type structure across the

highway. Just a bridge, no roads hooking up to it but just a bridge in the middle of nowhere, that you couldn't slow down to look at.

This led me to wonder, what are these people trying to do here. I tried to think of Nebraska's tourism slogan and eventually found it on the internet. Does anyone know it? You'll kick yourself when I tell you. Actually I found three slogans:

- *America's Heartland*
- *Cornhusker State*
- *The Tree Planters' State*

Obviously none of these are any good. Here are some possible alternatives they could consider:

- *Bring your own music* (although they do have both kinds of music there)
- *You can make good time in Nebraska* (In Nebraska, they don't have a lower speed limit for construction zones. All they want you to do is slow down to 75)
- *Sagebrush highway* (symbolizing the fun of running a slalom course down the interstate, avoiding the sagebrush whistling across the highway)
- *You can't get to Colorado without driving through Nebraska first* (this would only work for those coming from the northeast)

Or they could take a lesson from some of our own northeastern states. You know the familiar ones:

- *Someone loves New York*
- *Virginia has its lovers*

We're so embarrassed about the Pennsylvania slogan that you can't even find it on the PA website. But you can find some other interesting stuff there.

Like a list of rejected slogans for Arizona's tourism theme:

- *Arizona – Bring your camera and your Grandma*
- *Arizona – A Yucca minute*
- *Arizona – Where you can have a dirt lawn and its OK*
- *Get your AZ over here*
- *Arizona – the zippy zone*
- *Hug a zonie*
- *Arizona has the hots for you*

Closer to home, the Pocono Mountains recently unveiled its new slogan: "Pocono Mountains – more to love." You see, they were trying to shed the image some people hold of the Poconos as a tacky honeymoon capital. The heart-shaped logo in the new slogan represents the river and highway running through the Delaware Water Gap, rather than a bathtub. They better put a footnote on that slogan to explain that to potential visitors.

Northumberland (Ontario) solved its identity crisis through the slogan, "Real Ontario, Real Country, Real Close." They had nearly 1,800 catchy phrases submitted, and chose "We're close, We're country, We're waiting." A professional marketing consultant massaged those words into the final version, keeping two of the original six words. Should have gone with the rejected one, "did someone say party?"

Enough of that. Let me return to the planning phase of my trip to set the stage. I was on sabbatical last fall and getting ready to return from Fort Collins, CO to my home in Pennsylvania. The first decision was, should I go through Kansas or Nebraska. Tough decision. Kansas, Nebraska, Kansas, Nebraska. How do you decide. As it turns out, it doesn't make much difference. I looked at weather forecasts and travel distances and chose Nebraska. Besides, even though I was warned about Nebraska, I had already come out by way of Kansas and knew it didn't have much to offer.

Let's back up even farther and discuss the rocket box. Do you all know what a rocket box is? It's one of those yuppy, aerodynamic cartop carriers. (Not the Sears cartop carrier, which is just a box). I bought the rocket box before my family came out for a visit over Thanksgiving. I figured this was the best way to transport the five of us (with luggage and skis) in a Mazda 626 for about ten days (it beat out the next best option of renting another car by a wide margin). One of the reasons for choosing the rocket box was a marketing ploy – they would install it on my car for free. I knew the Sears box would require tools, which I didn't have. I also remembered hearing somewhere that you needed to put a small person (like a child or preferably a midget, because they are stronger) *inside* the box to install it on your car. Wishing to avoid this problem, I selected the rocket box.

Now here comes a marketing principle in action. I asked the sales person how much the rocket box would affect my gas mileage. He said not to worry about it, not much at all, maybe 1 mpg, 2 mpg at worst. Sounded good to me, but I was skeptical. From then on I started watching my mileage closely. The initial results were startling. I was losing about 10 mpg on my Mazda 626. I didn't panic, figuring that there were other factors involved. I was now transporting a full load of 5 people plus gear up and down the Rocky Mountains. Certainly this load was not equivalent to my normal highway driving conditions. I continued to keep track after the family returned home, all the way through my return to Pennsylvania. The rocket box continued to subtract a good 6-7 miles per gallon regardless of driving conditions.

This led me to my first basic marketing principle:

NEVER TELL THE CUSTOMER THE TRUTH.

I was forewarned of this principle several years ago by the Dilbert comic, which stated, "that just appears to be customer fraud. It's actually marketing."

You don't have to lie outright. Maybe just stretch the truth, exaggerate, or leave something out. Consider some other well known marketing campaigns demonstrating this principle:

"Save a buck or two" (1-800-Collect) – compared to what, putting up your own telephone lines. I guess it sounds better than "One of the more expensive ways you can make a long distance call"

"At last value in State College" (Motel 6) – this is on a sign outside Harrisburg on the way to State College. It makes you wonder, where is the value in a place that replaced a nice mom and pop motel that had some character, with a shoebox with a roof that charges at least \$10 more per night. I say at least \$10 because they always prominently display the room rate on their sign, and it is different almost everyday. The slogan should have read, "we'll get as much out of you as we can."

I had the opportunity to collect some tourism-related examples from Pigeon Forge, TN a week ago. (I was on a class trip, not just traveling around for fun). So many examples to choose from:

- *Anita Bryant Music Mansion Theatre: The largest theatre in the Smokies*
- *Dixie Stampede: The most fun place to eat in the Smokies, I guarantee it (Dolly Parton)*
- *Elwood Smooch's Hillbilly Hoedown: The happiest show in the Smokies*

The Pigeon Forge Travel Planner lists a lot of details for all of these places, such as

- 32 magnificent horses, beautiful belles, and beak to beak ostrich races (Dixie Stampede)

What is the underlying theme of these marketing strategies? I believe it is the use of numbers, and especially superlatives like #1, world's largest, newest, highest, happiest, whatever it is.

So what is principle #2:

QUANTIFY, QUANTIFY, QUANTIFY.

Now let's return to Nebraska's Pioneer Village for examples of these marketing principles in action.

Claim	Principle in Action	What's wrong with this
5 million satisfied visitors (on a billboard)	Principle 1: an obvious lie, completely unbelievable	Yellowstone doesn't have 5 million visitors, when did they start counting, and how do they know they were satisfied,
12 miles south of I-80 (on a billboard)	Principle 1: Way too honest/ Principle 2: Unfortunate use of numbers	Nobody wants to travel 12 extra miles out of their way (each direction) in Nebraska. Alternative: how about "just off the interstate"
50,000 Historic Items (on a billboard)	Principle 2: Inappropriate use of numbers	I have 50,000 historic items just in my garage; this has no drawing power. It is like Dr. Evil getting his numbers confused ("why make trillions when we can make billions")
Real name of place: Harold Warp's Pioneer Village (from the Internet)	Principle 1: Too much information	Harold may be a local hero, but we never heard of him. Better to leave this out, which they do except on their website.
28 buildings on 20 acres, 90 room Pioneer Motel, 100 antique tractors (from the Internet)	Principle 2: Overkill on numbers	This stuff is probably accurate. But who's counting. There was a whole lot more of this quantification on the website.

This marketing campaign did not increase my interest in visiting Pioneer Village.

Here are some other ludicrous examples of marketing to think about.

There are now ads on television for the new gold one dollar coin. Does anyone have one? Have you even seen one? Why market something where demand is so high that supply can't hope to keep up? How about marketing the Susan B. Anthony silver dollar. Or just don't worry about it. Who cares what kind of money people use?

Along the same line, there was a newspaper story and some ads about a company that has developed vending machines to count your coins, in exchange for a 9% commission. They offered a coupon for a free dollar coin as an incentive for trying their machines. Now, is there any need whatsoever for this service? What is so difficult about counting your change? Just spend it, or take it to a bank and they'll count it for free.

I saw a news story last week about a power company investing in research to reduce the flatulence among cows. (again, I'm not making this up). It seems the power company may get off the hook for its pollution emissions if it can mitigate the damage some other way, as in reducing cow farts, which appear to be a sizable problem in some areas.

Closer to our own field of study, power companies are now paying for research to determine if the lakes created by their dams are actually a factor in peoples' decision to visit the lake. You see, if someone just happens to visit the lake for some other reason besides the lake being there, then the power company doesn't have to pay for that person's share of the upkeep of the lake's facilities.

This reminds me of an early personal research memory. I was a master's student at Texas A&M and we went out to start a new project at Lake Amistad on the Mexico border. I was anxious to pilot test some new questions we had written attempting to measure anglers' attitudes towards

catching fish. "Consumptive propensity," we called it. This was early in the evolution of human dimensions, but the multiple satisfaction approach to fish and game management was gaining momentum, and it seemed useful to measure how important the harvest was to the overall fishing experience. Useful to us I guess, but not to the old boy who happened to be my first respondent, who greeted me with the statement, "what kind of damn fool questions are these, anyway."

Well I recovered from that challenge, and along with several others in the room, have continued to explore the concept of consumptive propensity, which does offer the resource manager a tool for segmenting user groups and managing for a quality recreational experience. So let's return to the power company research on why people visit the lake. While it seems like a straightforward matter (put a lake there and people will come to it), people are now haggling over how to ask the question so the benefits can be partitioned into those that were induced by the power project and those that were not. And the power company is lobbying its hardest for the question format that will yield the lowest percentage of "project-induced benefits." This may set a new standard for misuse of the benefits-based management concept.

Let's look at one final area of dubious research – economic impact analysis. I don't mean to offend anyone here (god knows I've done some of this research myself), but what is the point of it. Once they asked us to study the economic impact of football at Penn State University. Why bother? I didn't even know they were thinking about dropping football. Penn State's football program does not need to justify its existence (basketball, on the other hand, might be another matter). People spend a lot on it, everyone knew that before the study, and they still knew it afterward. But now they could put a number on it. So what? You know the irony of it; shortly after we showed that home football games pump some \$40 million into the local economy, a one dollar "impact fee" was added to the price of tickets to compensate the local governments for the extra services required on football Saturdays.

Last week I was astounded with a misuse of economic impact data. I listened to the acting superintendent of the Great Smoky Mountains National Park describe a current hot issue. The Cherokee tribe in Cherokee, NC had asked the park for several hundred acres in order to build new schools. It seems there is no other suitable land in the city and property values are so high because of the new casino. Besides, the casino generates \$2.5 billion in economic impact, which is greater than the sum total generated by Gatlinburg, Pigeon Forge, and Sevierville combined. Sounds compelling, right? When asked where the 2.5 billion dollars went, he said that 93% of it went back to the customers who put the money in the slot machines in the first place. Now that's not economic impact, it's just money changing hands, back and forth.

Let's do a hand-on exercise to demonstrate this point. Everyone take the largest bill in your billfold and hand it to the person sitting on your right. Then continue to pass those bills all around your table until you have your original bill back. (This exercise assumes honesty at the tables, the speaker is not responsible for any lost money). If we assume 100 people exchanged on average \$10, and did this ten times, we just created \$10,000 worth of economic activity. Do you think we could use this information to negotiate with the Omni hotel for a better rate? No. Why not. Because they are smarter than that. We too need to know the difference between bogus numbers and real ones.

Economic impact analysis is often applied to justify tourism development and marketing. Let me share with you the text found on a favorite t-shirt. I picked up this shirt in Sedona Arizona last fall, because it impressed me more than any other shirt I saw (which was quite a few in that tourism Mecca). It read:

*Go into the desert alone
Sit on a cactus
Pick up the bugs
Go without telling anyone
Pick up the snakes
Go without water*

*We thank you for your visit
Now go home*

Sedona Arizona

That captures the gist of it. No one wants tourists in their backyard. Nor in their town or the neighboring forest or park. They just want the money. Now there is the challenge for researchers and managers. Figure out how to get people to send their money without actually visiting or using the resource.

We have a good example with sportsmen. Hunting and angling groups are concerned that their numbers are declining, and are even calling for research aimed at increasing participation. Well, when is the last time you heard about an under exploited fish or game species. How could there be a problem of too few hunters and anglers? The problem is that fewer sportsmen means less license revenue, which impacts bureaucratic budgets. We need to find alternative funding strategies that remove agency programs from such problems. Perhaps the current funding initiatives relative to watchable wildlife and nonconsumptive recreation activities will lessen this problem in the future.

Let's think about bottled water as a final example. Consider two scenes observed in my home community. The first is a series of vending machines outside a large discount department store. These machines sell various beverages, including Coca-cola products, Pepsi products, and bottled water. Isn't it interesting that the companies that spend millions on advertising can sell their sodas for 35 or 40 cents a can, while the adjacent machine charges a dollar for the raw material that the soda companies start with before making their products. We all know there is no point in marketing Coke and Pepsi. People either like one more than the other (and would never buy the other one), or they don't care and buy whichever one is on sale. In either case they are not likely to be influenced by the companies' marketing campaigns.



On the other hand, you see very little marketing of bottled water, and it commands a high price that is unquestioned by consumers. This is demonstrated by the second scene,

which features a bottled water machine standing right next to a water fountain in a public high school. I wished I could be there at night to get a picture of them filling the bottles from the fountain and putting them in the machine.



Here they are charging a dollar for something that you can get for free very easily. How can they do this? It's not just that school kids these days have more money than they know what to do with. I've seen the same thing at the stadium and other places as well. I think people like to buy bottled water because they know it is good for them. It doesn't need marketing because it sells itself.

We can learn from this in marketing our parks and natural areas. In many cases, people are attracted to them because they know they are good. And they are willing to pay for them just the way they are. In essence parks are like bottled water. They can sell themselves. Let's learn to take advantage of their natural qualities and not worry about too many "improvements."

And let's not put up a sign saying, "Park ahead – do not stop or slow down." The National Park Service recently embarked on its "Message Project," which sought to find out what the American people think about their national parks. One of the things they learned was that, in many places, visitors are getting the message that the parks are being "loved to death," and they (the visitors) are the cause of the problem. This message must change. It is important to address the visitor impacts that underlie this image, by

restoring damaged areas and reducing visitor conflicts. At the same time, park information services should try to instill in visitors the idea that the parks are very much alive and worth protecting.

Thank you and enjoy the rest of the conference.

For Further Information:

<http://www.visitnebraska.org/>

<http://www2.pioneervillage.com/pv/>

Index of Authors

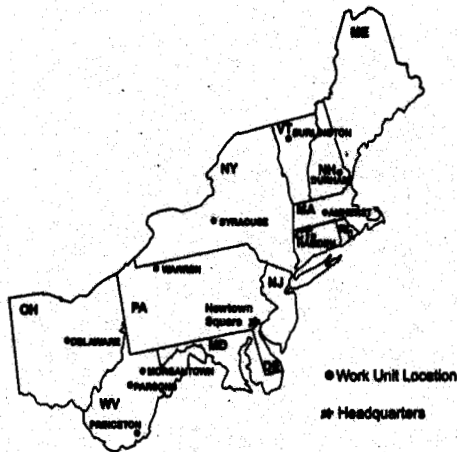
Author	Page(s)	Author	Page(s)
Absher, James	265	Lord, Bruce	49, 74
Armistead, Jeff	104	Maher, Patrick	155
Bacon, Jim	115	Manning, Robert	115, 167, 193
Barro, Susan	159	Marsinko, Allan	68, 83
Beaman, Jay	176, 183, 201	Mason, Doran	183
Biscombe, Jason	150	McClinton, Tiffany	83
Bristow, Robert	213, 234, 240	Mettey, Christian	240
Burns, Robert	265	Michaud, Jodi	28
Caldwell, Linda	89	More, Thomas	273
Cantillon, Heather	213, 234	Morrison, Alastair	94
Capozzi, Sergio	11	Mowen, Andrew	276
Carlsen, Erika	107	Newman, Peter	245
Chang, Wen-Huei	260	Norman, William	83
Chen, Po-ju	89	O'Leary, Joseph	94, 183, 201
Cooper, Tiffany	131	Oh, Sae-Sook	145
Davis, Gary	283	Oreskes, Rebecca	283
Dawson, Chad	11, 121, 283	Palmer, James	150
Demers, Brian	240	Pennington-Gray, Lori	207
Dennis, Donald	64	Place, G. Scott	40, 43
Doble, Siri	53	Potter, Tom	155
Dwyer, John	68, 159	Ramthun, Roy	104
Emery, Marla	53	Rickenbach, Mark	64
Fisher, Carolyn	260	Robertson, Robert	28, 107
Fitzgerald, W. Douglas	251	Sanders, Gloria	207
Francis, Achana	94	Schroeder, Herb	68
Gleason, Mark	260	Sheaffer, Amy	183
Goodale, Tom	3,	Shim, Jae-Myung	145
Graefe, Alan	20, 115, 131, 265, 299	Simon, Mark	283
Hall, Jeri	150	Sinclair, Kirk	187, 256
Halper, Nicole	240	Smardon, Richard	222
Halstead, John	58	Stevens, Thomas	64
Harper, Wendy	58	Strauss, Charles	49, 74
Hennessy, Rita	115	Thapa, Brijesh	20
Hill, Andrew	201	Todd, Sharon	131
Hill, L. Bruce	58	Twery, Mark	273
Hronek, Bruce	43, 143	Tzilkowski, Walter	49
Kaya, Latif Gurkan	222	Valliere, William	115, 193
Kelly, Stephanie	240	Vander Stoep, Gail	228
Kerstetter, Deborah	89	Wang, Benjamin	193
Kittredge, David	64	Wang, Cheng-Ping	121
Knuth, Barbara	187	Warnick, Rodney	289
Kyle, Gerard	115	Weisberg, John	176
LaPage, Will	278	White, Erin	207
Lawson, Steven	167, 193, 245	Wickham, Thomas	35
Lee, Joohyn	145	Williams, Rebecca	183
		Zinn, Harry	35

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