

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>Johyun Lee, Sae-Sook Oh, and Jae-Myung Shim</i>	145
--	-----

Universal Campsite Design: An Opportunity for Adaptive Management <i>Jason R. Biscombe, 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. Graefe301

Index of Authors307

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).

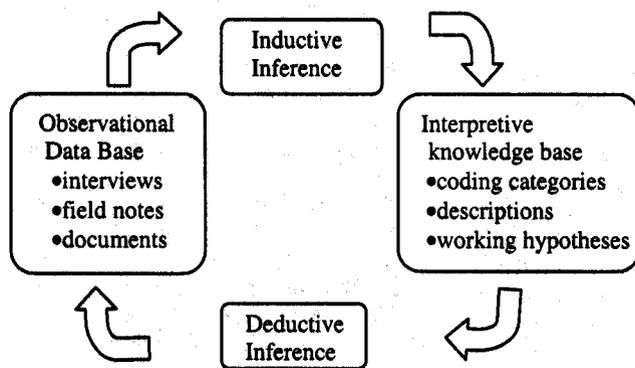


Figure 1. The induction-deduction process used in qualitative data analysis (after Shelly & Sibert 1992).

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 primary 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 joint 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 those 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.

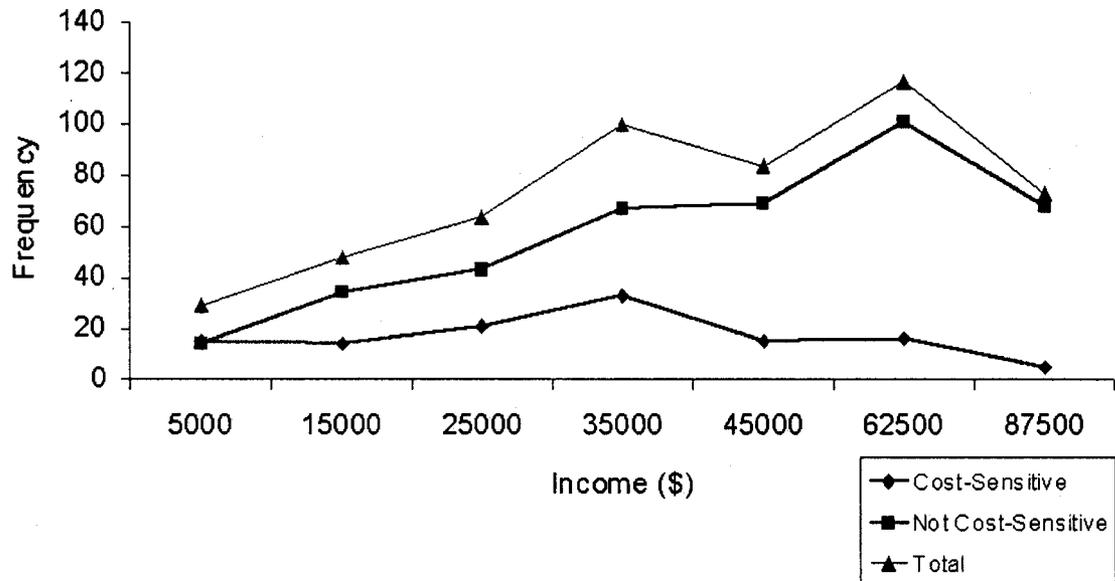
Cost sensitive respondents had significantly lower incomes than those who were not cost sensitive and they did not drive as far to the site on the day of the interview (Table 1). Cost sensitive respondents were significantly more likely to have children with their group at the time of the interview. 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.

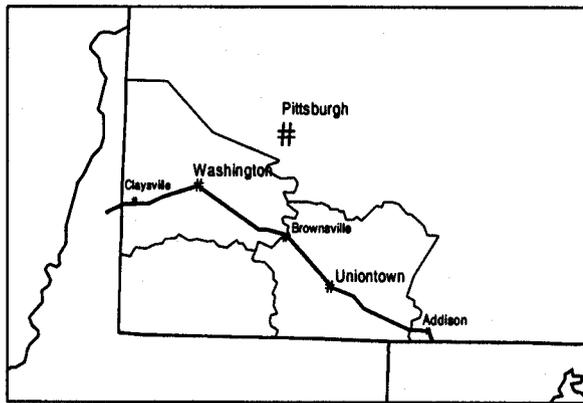
Certain variations are evident among these tourism studies in terms of their definitions of impact and economic modeling efforts. The more recent studies address the direct, indirect, and induced impacts of tourism expenditures, and are typically based upon an input-output model of the regional economy.

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	2.11	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, Nemaocolin 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.

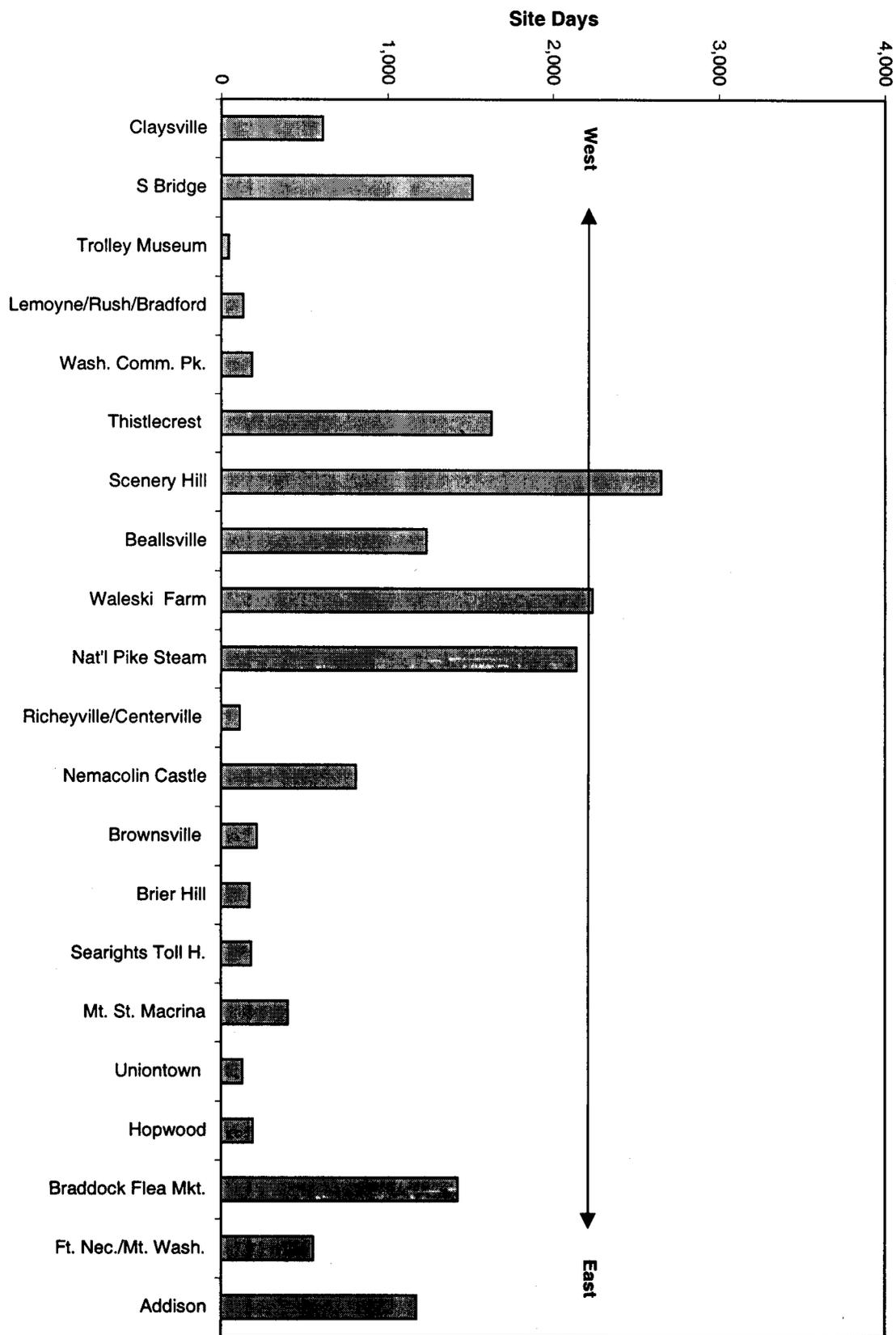
Economic Impacts

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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