Table of Contents

Tourism

The Perceived Impacts of Tourism: Economic, Environmental, and Sociocultural Influences of Tourism on the Host Community.
James Murdy, Andrew Yiannakis, and Josh Shuart 3

A Regional Analysis of the Consequences of Tourism Development From a Community Perspective.
Yooshik Yoon and Joseph S. Chen 11

An Evaluation of State Tourism Web Sites.
A. Leslie Burns and Robert A. Robertson 17

Sustainability Indicators Regarding Tourism Development and Coral Reef Conservation: A Case Study of Akumal, in the Mexican Caribbean.
Wendy J. Garpow 23

Developing a Culturally and Ecologically Sensitive Ecotourism in a Resource Extraction, Consumptive Recreation-Oriented Area.
Deborah Che 30

Virtual Tourism on the Internet.
Robert S. Bristow 35

Environmental Attitudes and Values

Environmentalism: A Study of Undergraduate Students.
Brijesh Thapa 41

Attitudes of Outdoor Recreationists Toward Environmental Issues.
Gene L. Theodori and A. E. Luloff 51

An Exploration of the Influence of Gender and Locality on Environmental Attitudes Using the New Ecological Paradigm (NEP) Scale.
Vinod Sasidharan and Brijesh Thapa 57

Recreational Use of Wetlands in Juneau, Alaska.
James F. Palmer 62

Environmental Education Needs Assessment: An Overview.
Anneliese Mueller, Robert A. Robertson, Eleanor Abrams, Scott Fletcher, Christine L. Schadler, and Dave L. Howell 67

Water Resource Issues in Recreation

Improving Recreational Customer Satisfaction: Focusing on Communication and Changes in Quality of Experience at US Army Corps of Engineers Reservoirs.
James D. Absher, Robert C. Burns, and Alan R. Graefe 73

Public Perception of the Connecticut River's Quality and Suitability as a Recreational Resource.
Jo Beth Mullens and Melissa McNally 78

A Holistic Approach to Maintaining Quality in Environmental Management and Visitor Experience.
Elery Hamilton-Smith 82

River of Promise: Community Based Conservation for the Cheat River Watershed in West Virginia.
Dave Bassage, Rick Buckley, Jeanne Kraje, Randy Robinson, and Steve Selin 86

Gender, Ethnicity, and Special Populations

Ethnicity and Recreation: Problems With Concepts and a Need For New Approaches.
Edwin Gomez 93

Similarities and Differences in the Outdoor Recreation Participation of Racial/Ethnic Groups: An Example from Illinois.
John F. Dwyer 98

Disabled Wildlife-Associated Recreation Participants.
Allan Marsinko 106

Visitor Experiences and Satisfaction

More on Conceptualizing and Measuring Leisure Involvement.
Gerard Kyle, Deborah Kerstetter, and Frank Guadagnolo 115

User Satisfactions and Perceptions of Crowding in Four Adirondack Wilderness Areas.
Chad Dawson, Peter Newman, and Cathy Fuller 120

Demographic Trends

Demographic Change in the 21st Century: The Impact on Recreation Participation.
Amy L. Sheaffer, Ken Cordell, and Joseph T. O'Leary 129

The New England Travel Market: An Update of Changing Demographics and Geographic Markets, 1980 to 1996.
Rod Warnick 134

Promoting In-State Tourism Using Travel Consumer Profiles.
Sotiris H. Avgoustis 141

The Relationship Between the Experiences of Organized Sports League and Leisure Attitude.
Seok-Pyo Hong 150

Recreation Planning and Management

Park Partnerships: A Case Study of Yosemite Institute and Yosemite National Park.
Siri Doble, Chad Dawson, and Robin Hoffman 157

The Importance of Environmental History in Natural Resources Management and Planning.
Karl Roenke 162

The Effect of Fees on Recreation Site Choice: Management/Agency Implications.
Allan Marsinko 164

Boosting Confidence In Importance-Performance Analysis: An Explanation and Application of An I/P Modification.
Erin K. Smith and Michael A. Tarrant 172

The Destruction of Wildlife Habitat by Suburban Sprawl and the Mitigating Effects of Land Use Planning.
Richard B. Nichols 177

Visitor Perceptions of Personal Security and Crime at Outdoor Recreation Areas: Contemporary Issues at US Army Corps of Engineers Lakes and Along the Appalachian Trail.
Robert C. Burns, Robert D. Lee Jr., and Alan R. Graefe 186

Weather Related Liability in Outdoor Recreation.
Bruce Hronek 190

Mountain Bicyclists' Behavior in Social Trail Etiquette Situations.
William W. Hendricks, Roy H. Ramthun, and Deborah J. Chavez 194

Distinctions Between Permitted and Non-permitted Registered Snowmobilers.
Joel A. Lynch and Charles M. Nelson 199

Historic Preservation in Recreation

Museums and Cultural Institutions in Michigan: Can They Be Viable Tourism Attractions and Tourism Industry Partners?
Gail A. Vander Stoep 205

Forest Resource Issues in Recreation

Aspects of Nonindustrial Forest Ownership That Influence Attaining Recreation and Other Nontimber Objectives.
Donald F. Dennis, Thomas H. Stevens, David B. Kittredge, and Mark G. Rickenbach 215

Recreationists' Attitudes Toward the Forest and Forest Management Policies.
Gene L. Theodori, A. E. Luloff, and Timothy A. Slack 219

Human Dimensions of Fisheries

Development and Verification of a Specialization Index for Angler Segmentation.
Ronald J. Salz and David K. Loomis 227

Testing Recreation Specialization: Application of a Specialization Index.
Kelly L. Finn and David K. Loomis 232

Assessment of Tourists' Attitudes Toward Marine Aquaculture - A Preliminary Investigation of UNH's Sea Grant Discovery Passengers
Torene Tango-Lowy and Robert A. Robertson 242

Economics of Outdoor Recreation and Tourism

Economic Impact of Elk Viewing in Rural Pennsylvania.
Bruce E. Lord, Charles H. Strauss, and Walter M. Tzilkowski 251

Fiscal Trends in America's State Parks: A Eight-Year Analysis.
Daniel D. McLean, Deborah Chavez, and Julie Knapp 257

Economic Impacts Of A Heritage Tourism System.
Charles H. Strauss and Bruce E. Lord 264

Spending Priorities for Outdoor Recreation Planning in New Hampshire: Implications for Managers.
Al Williams, Sam Lankford, and Robert A. Robertson 272

Determining Economic Impact Through Secondary Data.
Hans Vogelsong and Alan Graefe 275

Contemporary Issues in Recreation and the Environment

Information Search by Backpackers: A Qualitative Analysis of Planning Behaviors.
Roy Ramthun 285

Using Geographic Information Systems with Travel Cost Models: A Case Study.
William Zawacki and Allan Marsinko 287

Visitor Experiences and Participation

Five Good Reasons to Have Reservations About Benefits-Based Management.
Thomas A. More and Walter F. Kuentzel 295

Intensity and Extensity of Recreation Participation in Light of the Mean Scores on the Leisure Resourcefulness Scale.
Jerry L. Ricciardo 304

The Relationship Between Quiltmakers' Level of Development and Participation in Other Leisure Activities.
Sharon L. Todd 309

Self-Efficacy Perceptions Among Mid-Level Recreation Program Managers.
Julie S. Knapp and Daniel D. McLean 317

Place Attachment

Differences in Place Attachment Among Allegheny National Forest Users.
John J. Confer Jr., Alan Graefe, Jim Absher, and Brijesh Thapa 323

The Relationship Between Place Attachment and First Night Participants Views of Crowding, Overall Satisfaction and Future Attendance.
Thomas D. Wickham and Deborah L. Kerstetter 332

Relationships Between Place Attachment, Activity Involvement, Desired Experiences, and Frequency of Urban Park Use.
Andrew J. Mowen and Alan R. Graefe 336

Exploring Visitor Meanings of Place and Enriching Interpreter Knowledge of Audience in the National Capitol Parks.
Wei-Li Jasmine Chen, Theresa L. Wang, and David L. Larsen 340

Round Tables

A Roundtable: Discussion of Three Case Studies Involving Tourism and Wilderness Areas.
Stephen C. Bentley, Katharine C. Bloom, and Mark Gleason 347

Alternative Tourism: Gay and Lesbian Travelers - A Viable Hidden Market.
Kimberly Monk and Lisa Dingman 352

Poster Session

Use of Qualitative Data Analysis Tool to Understand the Relationship Between Recreational Fishing and Open Ocean Aquaculture Development.
Angela Wright and Robert A. Robertson 361

Estimating Tourism Impacts of Deer Hunting in New York State: A Case Study of 1997 Deer Take Data.
Russell W. Patterson, Aaron Alsheimer, James F. Booker, and Diana S. Sinton 366

Recreational Use of Industrial Forest Lands in New York State.
Sergio Capozzi, Rene Germain, and Chad Dawson 373

Competition for Common Property Space: New Hampshire's Recreational Fishers and Open Ocean Aquaculture Development.
Jody Grimes 378

Use of Qualitative Data Analysis to Demonstrate Three Approaches Taken by New Hampshire Recreational Fishers Toward Open Ocean Aquaculture Development
Nena F. Stracuzzi 384

The Use of GIS in Recreation Planning: An Application of Spatial Analysis to Find Suitable Locations for Recreational Trails.
Matthew Starr, Miklos Gratzer, and Allen Lewis 391

Storm Chasing: Risk Recreation for the Nineties.
Heather Cantillon, Jeremy Merriam, and Christopher Naughton 397

Who Owns the Ocean? A Qualitative Study Of Saltwater Recreational Fishers and Open Ocean Aquaculture in New Hampshire
Jody Grimes, Nena F. Stracuzzi, Robert Robertson, and Cynthia Duncan 400

Management Sessions

Maintaining the Quality of Park Resources and Visitor Experiences: An Overview of a New Handbook for Managers.
Theresa L. Wang, Dorothy H. Anderson, and David W. Lime 409

Founder's Forum

Reconceiving Recreation in an Era of Growing Social Inequality.
Thomas A. More 415

Keynote Address

Parks Have a Future - But it has More Problems than the Present.
Elery Hamilton-Smith 423

Index of Authors 426

Economics of Outdoor Recreation and Tourism

ECONOMIC IMPACT OF ELK VIEWING IN RURAL PENNSYLVANIA

Bruce E. Lord

Senior Research Assistant in Forest Reseorces, The Pennsylvania State University, 206 Ferguson Building, University Park, PA 16802

Charles H. Strauss

Professor of Forest Economics, The Pennsylvania State University, 104 Ferguson Building, University Park, PA 16802

Walter M. Tzilkowski

Associate Professor of Wildlife Science, The Pennsylvania State University, 306 Forest Resources Laboratory, University Park, PA 16802

Abstract: Pennsylvania's elk herd is attracting increased visitation to rural Elk and Cameron Counties. This study identified 73,500 visitor days associated with elk viewing in 1998. The 93% who were from outside the region generated over $900 thousand in value added impacts in the study area.

Introduction

A gradual increase in Pennsylvania's elk herd over the past decade to approximately 480 animals (Cogan 1999), and allied development of an elk viewing area by the Rocky Mountain Elk Foundation and the Pennsylvania Game Commission has resulted in a parallel increase in elk-viewing tourism. A study was instituted in 1997 through the support of the Rocky Mountain Elk Foundation to establish a profile of the visitors and estimate their economic impact in north-central Pennsylvania, namely Elk and Cameron Counties.

Study Procedures

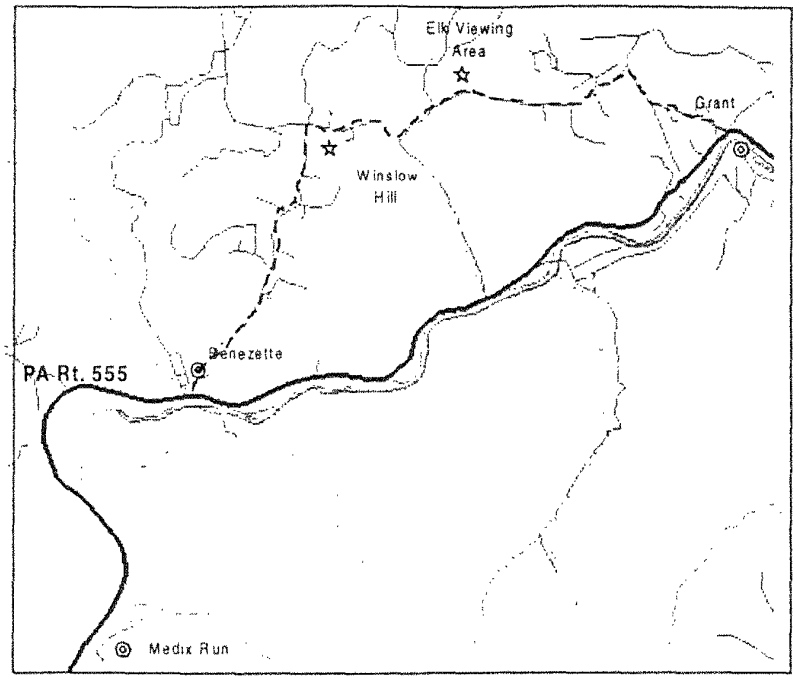
Visitor Surveys:
Fieldwork was initiated on Labor Day weekend of 1997. During the first year of the project (September 1997 - August 1998), 43 days of interview work provided 734 usable surveys. During the first two months of the second year of the project, 15 days were involved in survey work, providing 89 completed surveys. The highest rates of survey productivity were in September and October of the first year, with some of this production tied to having two survey persons on site. In contrast, our lowest production was in November, December, and January. This effort was warranted to identify the ebbs in attendance and the allied characteristics of the various audiences. During the second year, increased attention was paid to estimating the attendance patterns in the area, at the expense of individual surveys.

Attendance Estimating Procedures:
In conjunction with the on-site surveys of elk-viewers, traffic counts were taken to identify the number of people in the area. The traffic count system involved a total count of all non-commercial vehicles in the vicinity of the main viewing areas (Figure 1). During the first year, these counts were taken at various periods during the day. Special attention was made to securing counts near the beginning and end of the day. The intent of this system was to determine the patterns of visitation during the day, on different days of the week, and throughout the season. The system was modified during the fall of 1998 to better identify the daily patterns of visitation. This sample secured a total count of vehicles in the system, followed by a continual count of those entering and departing during 15-minute intervals. This combination provided a better identification of the peak visitation.

Vehicle counts were expanded to visitor days of usage based on the average passenger load per vehicle. From our interviw data, the average was 3.1 persons per vehicle. This average has been constant, ranging from 3.2 persons during the first four months of the study to 3.1 persons per vehicle over the entire sample period.

A two-stage procedure was established to expand these point samples of visitation into daily and then seasonal estimates. The first stage expanded the individual observations taken over any given day into a total estimate for the day. An examination of the data showed a bimodal distribution through the day, with peaks occurring at the prime viewing times of dawn and dusk. This trend was most pronounced during the fall when the number of visitors was large. In the winter and spring period there were fewer morning visitors than observed in the fall period, with the AM peaks less discernible. From the visitor surveys, we concluded that 39% of the AM users stayed the entire day. Similarly, 17% of the PM users indicated that they were involved in morning elk watching. With this information, an entire day's attendance could be predicted.

Figure 1. Map of the Study Area.



The second stage of the estimation process involved expanding daily measures into annual estimates. The year was divided into two periods. The first covered the elk rut season, starting with the Labor Day weekend and extending through November. This period peaked on Saturday, October 11 in 1997. After this date attendance tapered off over the remainder of the period. In 1998, the peak was on Saturday, October 3, and again attendance tapered off over the remainder of the period.

The second period represented off-season attendance and was characterized by a sharp decline in December, followed by a gradual increase through the spring and summer periods.

Nonlinear regression was fitted to each period's data to predict the non-surveyed days. A triangular distribution based upon the day of the year was the main predictor. This distribution centers on the peak day, and has visitation tapering in a linear fashion during the weeks before and after the peak. In addition, an indicator variable was used to identify weekend versus weekday differences. This variable showed visitation doubling on weekends during the peak season. These regression equations for each period were then used to predict the overall visitation levels throughout the year.

Economic Impact Procedures:

The economic impact of the visitors to the elk viewing area was generated by 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 (Alward et al. 1985). It is commercially available from the Minnesota IMPLAN Group, Inc. on a fee basis.

Economic impact was determined from the regional expenditures made by non-resident visitors to the viewing areas. 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.

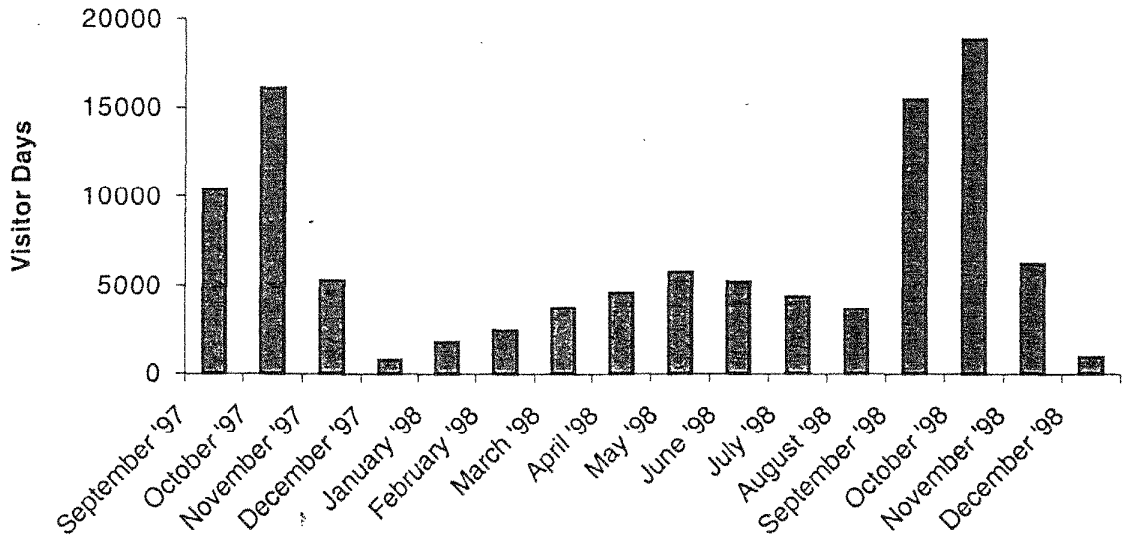
The economic impact of non-resident expenditures are identified in terms of (1) the direct impacts from sectors serving non-resident visitors, (2) the indirect impacts from other sectors having commercial linkages with direct sectors and, (3) the induced impacts from the regional expenditure of wages and salaries earned in the direct and indirect sectors. The latter two are often grouped together as secondary impacts.

Results

Attendance Characteristics

Attendance in the Benezette and Winslow Hill elk-viewing areas was estimated in terms of visitor days (one person's visit of some portion of any given day). Visitation for 1998 was estimated at 73,500 visitor days. The monthly distributions for the 1998 were 21% in September, 26% in October, and 9% in November; with this three-month span representing 56% of the annual visitation (Figure 2). The three-month winter span realized only 6% of the annual total. The spring and summer months gathered the remaining 38% of annual visitation. The fall period of September through November in 1998 was estimated to be 27% higher than the during the same period of the previous year.

Figure 2. Attendance at Benezette Elk Viewing Area, 1997-1998.



The most obvious trend during the twelve-month period was the major build of attendance during the popular elk-rut season. Obviously, the public arrived in large numbers to see the bulls assemble their harems and hear them bugle. However, what is also interesting is the comparatively low attendance registered during November through January. There was some speculation that the small game and deer hunting seasons, and the allied presence of regional hunting camps, might generate a complimentary interest in elk watching among hunters. Although a certain synergy did occur between these two pursuits, it was not of sufficient volume to swell December's attendance. In fact, December was the lowest attended month during the twelve-month period.

Visitor Characteristics

Geographic Origin: Over the 15-month study, 7% of those persons interviewed were from Elk and Cameron Counties, 86% were Pennsylvania residents living outside this two-county region, and 7% were non-residents of the state. These distributions have not changed during the past 15 months (Lord et al. 1998).

Vehicle Occupancy Level: As previously identified, the vehicle occupancy level among elk-viewers averaged 3.1 persons per vehicle. This level, no doubt, reflected the high percentage of family groups surveyed over the 15-month study (64% family groups, 18% peer groups, 16% individuals and 2% tour groups).

Relative Importance of Elk-Viewing: Elk viewing was a priority item on the travel itineraries of most visitors. In fact, 86% of the non-resident visitors indicated elk viewing was the primary reason for their trip (Table 1). An additional 12% listed it as a secondary reason for their trip, whereas only 2% considered it as an incidental component of their trip. Once again, these percentages did not change between the fall and winter/spring/summer audiences.

These rankings are important to expenditure and impact analyses. In our methodology, if an activity was the primary component on a travel itinerary, all of the visitor's regional expenditures were credited to that pursuit. Whereas, if it was considered secondary, the daily expenditures were divided among the various activities, and, if it was incidental, none of the expenditures were credited to the activity.

Table 1. Relative Importance of Elk Viewing to Non-Resident Visitors.

Reason	
Primary	86%
Shared	12%
Incidental	2%

Average Daily Expenditures: The average daily expenditure for visitors (regardless of their priority to elk viewing) was measured on a visitor day basis. The average non-resident elk viewer spent $19.10 per visitor day in the region. Resident viewers spent $5.73 per visitor day. The major expenditures among non-residents were food, transportation, and lodging, constituting nearly 90% of their expenses.

The level of non-resident expenditures for elk viewers was consistent with similar audiences from other tourism studies conducted in Pennsylvania (Strauss et al. 1996, Lord et al. 1996b). Furthermore, their distribution of expenses was consistent with other audiences engaged in over-night travel (sporting events, craft festivals, and heritage tourism). One exception was the lower percentage of expenditure devoted to lodging among elk-viewers. Several factors probably served to lower the amount spent on lodging, including the use of privately owned cabins within the region, over-nighting outside the two-county region, or not over-nighting at all.

Nights in the Region: Our survey of non-resident visitors showed 15% owning a second home within the two-county region. Among the non-resident visitors, 39% were involved in an overnight stay within the region (Table 2). If the 15% who owned second homes in the region used these facilities during their overnight stay, the remaining 24% either used commercial lodging or stayed with friends. An additional 13% of the non-resident visitors owned a second home in an adjacent county. Almost all of the over-nighting in adjacent counties was in second homes, with hotel usage negligible.

Table 2. Percent of Overnight Stays Among Non-Resident Visitors Within The Region or in Adjacent Counties.

	Number of Nights			
	1	2	3+	Total
In Region	15%	17%	7%	39%
Near Region	5%	5%	4%	14%
Total	20%	22%	11%	52%

Sources of Information on Elk-Viewing: The most prevalent source of information on the location and timing of elk viewing in the Benezette area was from "word of mouth", representing 61% of the sources. An additional 12% of the audience credited local or common knowledge as their primary source of information. These percentages include both resident and non-resident viewers, which probably increased access to local information. The combination of published information, from such sources as the Pennsylvania Game Commission's Game News, Rocky Mountain Elk Foundation publications, or other newspapers, magazines and brochures, represented another 20% of the information sources.

Average Annual Visitation Rates: The average annual visitation rate for residents of the two-county region was 11.8 days per year and for non-residents was 4.3 days per year. These annual participation rates are of value in determining the absolute size of the audience (visitors or people), as opposed to the "traffic count" measure (visitor days of use). Essentially, a division of the total annual visitor days of attendance by the annual visitation rates, as stratified by residents and non-residents, would provide an estimate of the absolute number of people involved in elk-watching. This absolute size of the audience is important from marketing or political viewpoints, whereas the measure of total usage (visitor days) is important to the logistical and economic impacts realized within the region.

Memberships in Outdoor Organizations: The most prevalent affiliation among elk-watchers was in terms of local sportsmen clubs, with 21% of those interviewed having such a membership (Table 3). The next most prevalent affiliation was with the National Rifle Association, representing 19% of those interviewed. Third most popular, identified among 8% of those interviewed, was the Rocky Mountain Elk Foundation (RMEF). Of interest, however, only 1% of those interviewed credited RMEF publications as a source of information on the Benezette destination. An additional 20% of the visitors listed affiliations with other wildlife or outdoor organizations.

Table 3. Membership in Outdoor Organizations Among Elk Viewers.

Organization	Percent of respondents
Local Sportsmen's Club	21%
NRA	19%
RMEF	8%
NAHC	7%
Wild Turkey	3%
Ducks Unlimited	2%
NWF	2%
Conservation Club	1%
Audubon	1%
Buckmasters	1%
Nature Conservancy	1%
Wildlife Forever	1%
Bow Hunters	1%

Suggestions for Improvements in Elk Viewing: Among the 823 persons interviewed, 528 suggestions were gathered from 48% of the respondents regarding ways and means for improving elk-viewing (Table 4). Apparently, 52% of the audience was sufficiently satisfied with their experience and had no further suggestions for improving the area.
Among the people offering recommendations, 38% suggested improving the road and parking areas. Another 29% were related to the signing and information systems. About 7% of the respondents requested improvements to the rest room situation.

Table 4. Top 5 Suggestions for Improving the Elk Viewing (Out Of 823 Surveys).

Roads/Parking	152
Signs	82
Info	35
Bathrooms	27
More/Improved Viewing Areas	25

Economic Impacts

The expenditures of the non-resident audience were entered into the IMPLAN model. Most of the expenditure categories, e.g. lodging and restaurants, are identified as specific sectors within the IMPLAN model. Other expenditures entailed distributions among several sectors. Food purchased for personal consumption, and sporting goods are identified with a variety of economic sectors. These were based upon personal consumption expenditure profiles taken from the model.

Non-resident visitors spent over $1.3 million in the region during 1998. The direct output impact was $955 thousand, representing a loss due to imported goods and services (Table 5). This 27% reduction in visitor expenditures to direct impacts was consistent with other tourism-based studies. The direct and induced effects resulted in a secondary impact of $767 thousand and contributed to a total output impact of $1.7 million. The value added impact was $912 thousand. This economic impact generated $482 thousand in employment compensation, which supported 42 jobs in the region.

Table 5. The Annual Economic Impact of Elk Viewing in Pennsylvania,1998.

	Direct Output	Secondary Output	Total Output	Value Added	Employee Compensation	Jobs
Agriculture	20,211	5,692	25,902	22,322	4,289	0.8
Mining	258	665	923	505	149	0.0
Construction	0	37,982	37,982	19,559	9,732	0.5
Manufacturing	99,274	55,211	154,485	73,723	37,557	1.4
Transportation, Communications and Public Utilities	26,954	73,476	100,430	44,429	19,094	1.0
Trade	479,580	155,038	634,619	309,702	190,073	20.7
Finance, Insurance and Real Estate	0	166,204	166,204	106,011	12,189	0.6
Services	326,946	247,287	574,233	323,483	197,843	16.1
Government	1,845	23,234	25,079	10,381	9,063	0.2
Other	0	2,105	2,105	2,105	2,105	0.3
Total	955,068	766,892	1,721,960	912,219	482,093	41.7

The regional economy for Elk and Cameron Counties was modeled by IMPLAN as $1.1 billion in total industrial output. The percent of visitor expenditures retained as value added impact was 70%. This was somewhat lower than the tourism multipliers observed in other Pennsylvania counties (Lord et al. 1996a)

The aggregate of the trade sectors received the largest portion of the direct impacts ($479 thousand), reflecting the major role of the eating and drinking sector (Table 5). This was followed by the aggregate of the services sectors ($327 thousand), based largely on the hotel and lodging places sector. Significant direct impacts also occurred in the manufacturing sectors.

Secondary impacts were more broad based. The largest amounts were found in the services group ($247 thousand), the finance, insurance and real estate group ($166 thousand) and in the trade group ($155 thousand). Most of the secondary impacts were of an induced nature from household purchases (78%). This is a result of the high proportion of labor costs in the sectors making up the tourist industry, and the scarcity of locally produced material inputs to this industry.

Total impacts were also widely dispersed. The trade group was the site of $635 thousand in industrial output. This group also logged $310 thousand in value added impacts. Of this, $190 thousand supported 21 employment positions in the region. This was half of the employment attributed to elk watching. Almost as important was the $574 thousand of total output in the services group. The value added benefits in this sector were $323 thousand, larger than the trade group. Similarly, the $198 thousand in employee compensation was larger than for the trade group. The 16 employment positions were smaller, indicating a better wage structure in these industrial sectors. Total impacts were also significant in the finance, insurance and real estate group, the manufacturing group and the transportation, communications and public utilities group ($166, $154 and $100 thousand, respectively).

The individual sectors receiving the impacts tell a great deal about how the activity effects the local region's economy. The top two sectors, eating and drinking, and hotel and lodging places received 19% and 14% of the economic impact respectively. This was largely based upon direct impacts. The next largest impacted sectors are owner occupied dwellings (7.5%) and hospitals (5.0%). These are the largest two induced impact sectors (18% and 12% of induced impacts respectively).

Conclusions

Elk watching has become a significant source of tourism in Elk and Cameron Counties of Pennsylvania. Over 730 visitors were surveyed to determine their recreational profile and expenditure levels. Over 92% of the visits were by people from outside of the two county region. Elk viewing was the primary pursuit of 86% of the non-resident visitors. In 1998, the non-resident visitors spent over $1.3 million in the region. Almost all of this (90%) was spent on food, lodging and transportation. The region produced $955 thousand in industrial output to support this direct impact. Total impacts were $1.7 million. The value added component of this was $912 thousand and supported 42 jobs in the region.

The sectors receiving the direct impacts are largely connected to the primary expenditure categories of food, lodging and, to a lesser extent, transportation. The secondary impacts are broadly distributed, owing to their induced origin.

Only 24 percent of the non-resident visitors stayed overnight in local lodging places, with another 15 percent staying in private camps. An additional 14 percent stayed in private camps in adjacent counties. Hotel and lodging use in adjacent counties was almost non-existent. The economic benefits accruing from this tourism indicates that an expansion of the transportation and hospitality facilities in the region may be needed.

The size of the current impacts, along with the growth in visitation over comparable periods in 1997 and 1998 (almost 30% growth in the peak viewing period) indicate that continued monitoring of the situation is warranted.

References

Alward, G. S., H. C. Davis, K. A. Despotakis, and E. M. Lofting. 1985. Regional non-survey input-output analysis with IMPLAN. Paper presented at the Southern Regional Science Association Conference. Washington, DC. May 9-10, 1985.

Cogan, R. D. 1999. Pennsylvania Elk Trap and Transfer Progress Report #12. Pennsylvania Game Commission.

Lord B. E., C. H. Strauss and S. C. Grado. 1996a. County-level travel and tourism impacts - - contrasting nine Pennsylvania counties. IN: Proceedings of the National IMPLAN User's Symposium. Minnesota IMPLAN Group, Inc. and University of Minnesota.

Lord, B. E., C. H. Strauss and S. C. Grado. 1996b. The economic impact of state forest recreation in southwestern Pennsylvania. IN: Proceedings of the 1995 Northeastern Recreation Research Symposium. USDA Forest Service Gen. Tech. Rpt. NE- 218. pp. 137-141.

Lord, B. E., C. H. Strauss and W. M. Tzilkowski. 1998. Economic Impact of Elk Viewing in Rural Pennsylvania. Paper presented at: 1998 National IMPLAN Conference, October 15-16, 1998. Washington, DC. 9pp.

North Central Pennsylvania Regional Planning and Development Commission. 1998. A Plan for Creating an Eastern Elk Heritage Park. NCPRPDC. Ridgway, PA. 81pp.

Strauss, C. H., B. E. Lord and S. C. Grado. 1996. IMPLAN analysis of travel and tourism in southwestern Pennsylvania. IN: Proceedings of the National IMPLAN User's Symposium. Minnesota IMPLAN Group, Inc. and University of Minnesota. pp. 240 - 266.

FISCAL TRENDS IN AMERICA'S STATE PARKS: AN 8-YEAR ANALYSIS

Daniel D. McLean

Associate Professor, Department of Recreation & Park Administration, Indiana University, 1025 East 7th Street, HPER 133, Bloomington, IN 47405-7109

Deborah Chavez

Research Social Scientist, USDA - Forest Service, Forest Fire Laboratory, 4955 Canyon Crest Drive, Riverside, CA 92507

Julie S. Knapp

Lecturer, Department of Recreation & Park Administration, Indiana University, 1025 East 7th Street, HPER 131, Bloomington, IN 47405-7109

Abstract: The National Association of State Park Directors (NASPD) has gathered data about state parks for 20 years. Consistent data has been available since 1992. Of particular interest is data relating to fiscal issues. This study looked at income sources, earned income, operational expenditures, state park budgets as a percent of the total state budget, and a comparative analysis of data. The data found that in every instance, except earned income, state park agencies minimally kep pace with inflation. State park agencies have more dollars to spend on operations in 1999 than in 1992. In 1992 sate parks had available an average of $98 per acre. By 1999 that had shrunk to $92 per acre (using 1992 dollars). Earned income can be viewed from different perspectives in relation to its importance to state park agencies. The utilization of earned income has increased steadily, but at the expense of compulsory income (tax dollars). Earned income is replacing some levels compulsory income so that total income available for operations is not increasing at the same rate. The number of full-time employee has decreased over the reporting period.

Introduction

America's state parks are a unique resource providing close to home outdoor recreation opportunities. The presence of these parks in America's urban and rural areas is a significant natural, historical and cultural resource that adds to the base of recreation and leisure opportunities. In many ways the 50 state park systems are both unique and common. Common in the sense that many state park resources seem to reoccur throughout the United States — the presence of large open spaces for play, recreation, and relaxation — and unique in ways that only a few sites in each state can represent, such as South Dakota's Custer State Park, New York's Niagara Reservation State Park, or Kentucky's Natural Bridge State Resort Park.

The National Association of State Park Directors (NASPD) is composed of the 50 state park directors in the United States. They meet on an annual basis to discuss common issues and are additionally linked through an executive director and several electronic communications methods.

The Annual Information Exchange

The Annual Information Exchange (AIX), first conceived in the mid 1970s, is the primary source of data available to state park directors and researchers, dealing exclusively with state parks. The AIX is published annually by NASPD in conjunction with the Department of Recreation and Park Administration at Indiana University. As with any on-going data gathering process, refinements have been made on a regular basis. Prior to 1991 the AIX struggled to gather consistent and reliable data. Since 1991 the data collection has become more consistent and reliable. Indiana University began data collection and reporting responsibilities with the 1997 AIX.

The existing AIX survey instrument is 19 pages long and secures data for 7 areas: 1) inventory of areas; 2) types of facilities; 3) visitation and use; 4) capital improvements; 5) financing; 6) personnel; and 7) support groups.

AIX Questionnaire

The AIX questionnaire is mailed every September to the 50 state park directors and their designated individual who completes the survey instrument. The information requested usually requires each agency to contact a number of individuals to gather all of the data. Sent with the AIX is a set of instructions on "how to" complete the survey and includes definitions relevant for all terminology used in the AIX. States can respond by completing and returning the survey that was mailed to them, or submitting the data via the world wide web. There is a 100 percent response rate every year. When data is not received in a timely manner, the Indiana University staff makes contact with the particular state park agency to encourage submission. The NASPD Executive Director makes a final contact to agencies who are particularly slow in submission. Submission, corrections, validation of data and publishing the final report takes six months.

The data received is inputted into a Microsoft Excel file and then compared to the previous year's data. When data is found to be inconsistent, the state is called and asked about the discrepancy. Changes in data may occur for a number of reasons. Changes may occur as a result of legislative action, current or previous clerical error, or agency change in designation of a particular area or type of areas. After all data has been verified, a draft copy of the report is prepared and mailed to the 50 state park directors. They have three weeks to review the data and to make corrections. After that period, the report is published. The report period covers from July 1 through June 30 of he previous year. The 1999 AIX, for example, covers a period from July 1, 1997 through June 30, 1998.

Data Limitations

Any longitudinal data set presents unique data collection challenges and the AIX is no exception. Key problems associated with data collection are an inconsistency within and between the states. It is not uncommon to have 3 different individuals complete the AIX over a 3 year period in one state. Each individual brings different interpretations to the data and responds accordingly. Even with definitions the same respondents will change their interpretations from year to year. When state park facilities do not correspond with AIX definitions the states either arbitrarily make decisions or ask the data gathering agency for clarifications. Attention to detail is another issue. Every year literally dozens of telephone calls are made to verify and correct data. The major data limitation, however, is the absence of accurate counting methods at many state park facilities. Typically state parks will have at least 6 months and maybe more when no one counts attendance. At states without entrance fees there may be no formal counting process.

Overview of the State Parks

It is helpful to understand the size and context of the state park estate. For the period ending June 30, 1998, state park agencies reported administering 5,870 areas of which 5,320 were operational (91 percent), including 12.7 million acres. Attendance at state park agency administered areas for the same period was 761 million visits. This included both day and overnight visits.

The State Park agencies administer 11 different types of areas, not all of which are common among the states. State parks are the largest single category totaling 1,769 and 7.9 million acres. Three states do not have the "state park" designation in their system and accordingly report none. The 50 agencies provide 206,000 campsites, 6,045 cabins, 115 lodges, 254 marinas, 291 swimming pools, and 26 ski slopes. Day visitation is by far the largest single type of use representing 92 percent of all users. Yet, 50 million campsites were rented in 1997-1998, and 2.3 million lodge rooms.

No matter how you look at it the State Parks are big business!

Data

This study looked at four fiscal trends over an 8 year period: 1) total income, 2) earned income, 3) operational expenditures, and 4) percent of state park budget as part of state budget. Data analysis was kept to simple descriptive statistics. Data prior to 1992 was not included. For comparative purposes 1992 dollars were used. A line running parallel to the horizontal axis (years) of the table. The Gross Domestic Product provided data for determining the deflator.

Income Types

There are six identified types of income as reported by NASPD. They are 1) unappropriated revenues, 2) appropriated revenues, 3) the general fund, 4) dedicated funds, 5) federal funds, and 6) other sources.

Each of the funding type provides a source of income to state park agencies. Figure 1 depicts total income from all sources for the fifty states as reported in the 1999 AIX. The general fund, a source of compulsory income, is the single largest source of income for state park agencies representing 47 percent of all income. Appropriated revenues rank second at 30 percent. Unappropriated revenues and dedicated funds were the next highest levels of income at 10 percent and 9 percent respectively. Federal funds account for only 1 percent of state park operating funds.

Total income is represented by all six income types identified in Figure 1. Table 1 depicts total income sources for the period 1992 through 1999. The data, reported in 1992 dollars, holds inflation as a constant. In other words, by using 1992 dollars inflation is allowed to be mapped as a single horizontal line beginning with 0 percent in 1992 and running horizontal and parallel to the base axis (year's). The data points represent the succeeding year's income converted via deflators to 1992 dollars. This is repeated in each table.

State park agencies fell behind inflation in 1993 and 1994. The 1993 decrease in funding represented a 3.6 percent decline in funds. This increased by 2.95 percent in 1994, but still remained behind inflation. Beginning in 1995 and continuing state park agencies have successfully secured income at a rate exceeding that of inflation. Inflation has changed an average of 2.29 percent over the period while state park income, when adjusted to 1992 dollars, has grown an average of 1.1 percent above inflation. 1993 was the only year where income decreased, but the growth of income has not been marked by periods of consistent growth, but rather by spurts. Three years showed growth above 2 percent (1994, 1996, 1999), two years between 1 percent and 2 percent (1995 and 1997), one year below 1 percent (1998), and one year an actual decline (1993). The purchasing power of state parks has increased minimally over the study period.

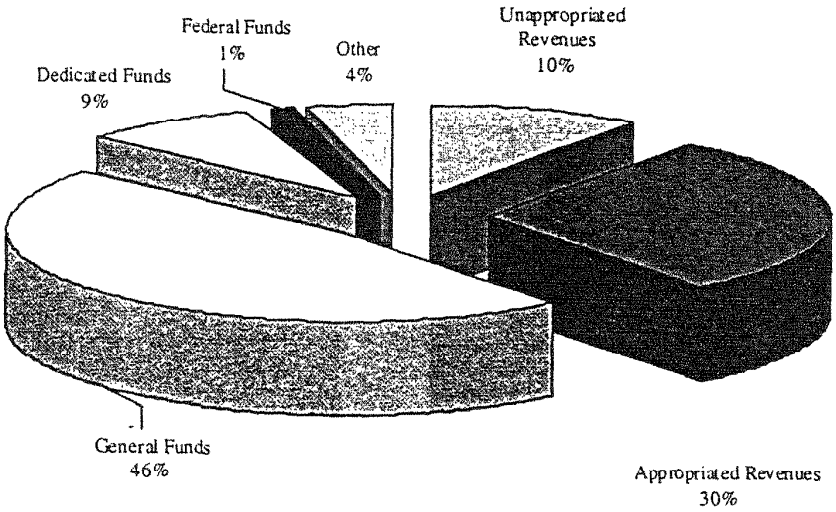


Figure 1: 1999 Reported Income Sources

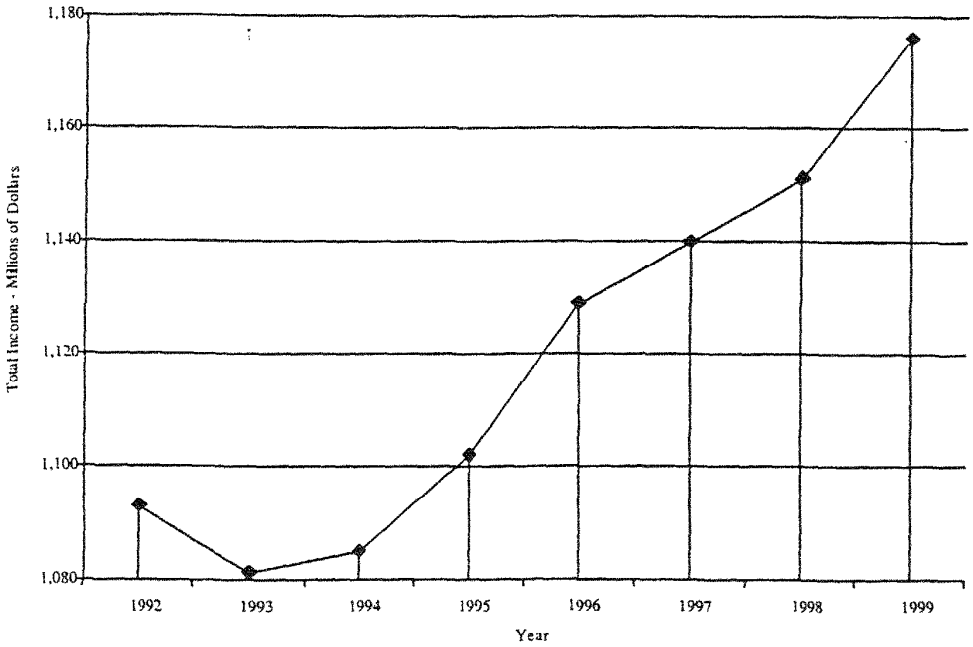


Table 1. Total Income

Earned Income

Earned income, as a part of total income is defined as "income generated from fees and charges assessed by the state for services and programs" (NASPD AIX, 1999). It may also include contractual income. Brayley and McLean (1999) identify earned income is an expanding source of revenue for public agencies. Earned income has increased steadily as a source of revenue for state parks during the last 20 years. During the course of this study earned income has grown at a consistent rate (4.2 percent), with the exception of 1993 (6.7 percent) and 1999 (15.7 percent) when it appears to have increased more dramatically (Table 2). The 1999 state data depicts one state increasing its income by $50 million while many other states showed modest increases. The increase by the single state may be a representation of a change in data gathering and reporting procedures or may be actual new income. Ensuing reports will assist in validating this growth. In two years (1994 and 1996) earned income showed a decline. In each case it was less than 2 percent and the next year provided an increase

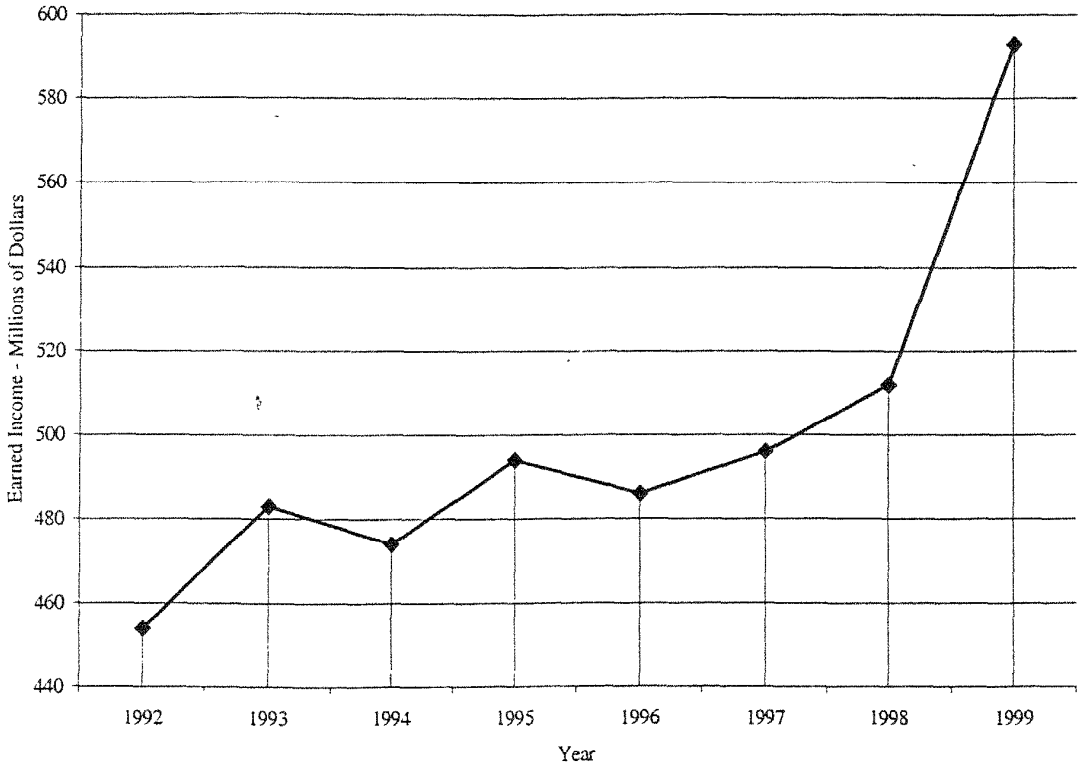


Table 2. Earned Income

Earned income has out-paced inflation, growing at an average annual rate of 4.03 percent. This may be a reflection of state park agencies becoming more entrepreneurial. There is some data to suggest that the entrepreneurial spirit is more a reflection of budgetary impacts and political philosophy (Brayley & McLean, 1998).

From a national perspective earned income has increased as a part of total income, but it has not significantly impacted upon the size of total operating budgets. Some states have been considerably more entrepreneurial than others. Total income has grown at an average of 1.1 percent when adjusted to 1992 dollars and earned income has grown over the same period at an average of 4.03 percent from $453 million to $593 million (1992 dollars). It is anticipated that earned income will continue to grow as state park agencies strive to diversify their sources of revenue. It is appropriate to note here that not all the revenue state parks generate may go back into the state parks. Disbursement of revenue earned is determined on a state by state basis. Conversely, several states have reported that as earned income has increased, general fund appropriations have seen equal levels of reduction (McLean, 1998). The data in Table 3 clearly reflects that earned income is growing faster than total income and is replacing some more traditional income sources.

Table 3: Earned Income as a Percentage of Total Income

Year	Total Income 1992 $	Earned Income 1992 $	Perecent of Total Income	Percent Annual Change
1992	1,093,204,469	453,645,060	41%	
1993	1,053,993,055	483,773,776	46%	7%
1994	1,085,047,381	474,217,954	44%	-2%
1995	1,102,343,698	493,741,425	45%	4%
1996	1,128,504,637	485,598,113	43%	-2%
1997	1,140,078,310	495,616,705	43%	2%
1998	1,150,721,163	512,266,033	45%	3%
1999	1,176,149,237	592,556,371	50%	16%
Mean	1,116,255,244	498,926,929	45%	4%

Operational Expenditures

Operational expenditures represent the lifeblood of daily activities among state park agencies. Operational expenditures do not include capital expenditures. Operational expenditures increased at an average rate of 1.01 percent over the study period, when measured by 1992 dollars. In 1992 and 1993 operational expenditures were below inflation. In 1995 operational expenditures barely exceeded inflation and did nothing to make up for the lost purchasing power of the previous two years. For that 3 year period operational expenditures showed a growth of only .17 percent. Beginning in 1996 operational expenditures grew at a rate of 1.6 percent through 1999. While operational expenditures have increased the growth has been slow, but the consistent growth over the last 7 years has been positive.

Percent of State Budget

State park agencies portion of the total state budget over the 8 year period is .2 percent of the total operating budget or .002 cents of every dollar represented in the state budget. The level of representation of state parks budgets within the total state system budget has remained fairly consistent over the study period. Some few states have received an amount equal to 1 percent of the state budget while others have received as little as .08 percent. It is not likely that state parks will see major increases in their share of state operating budgets in the near future.

Table 4: 1992-1999 Operational Expenditures (1992 Dollars)

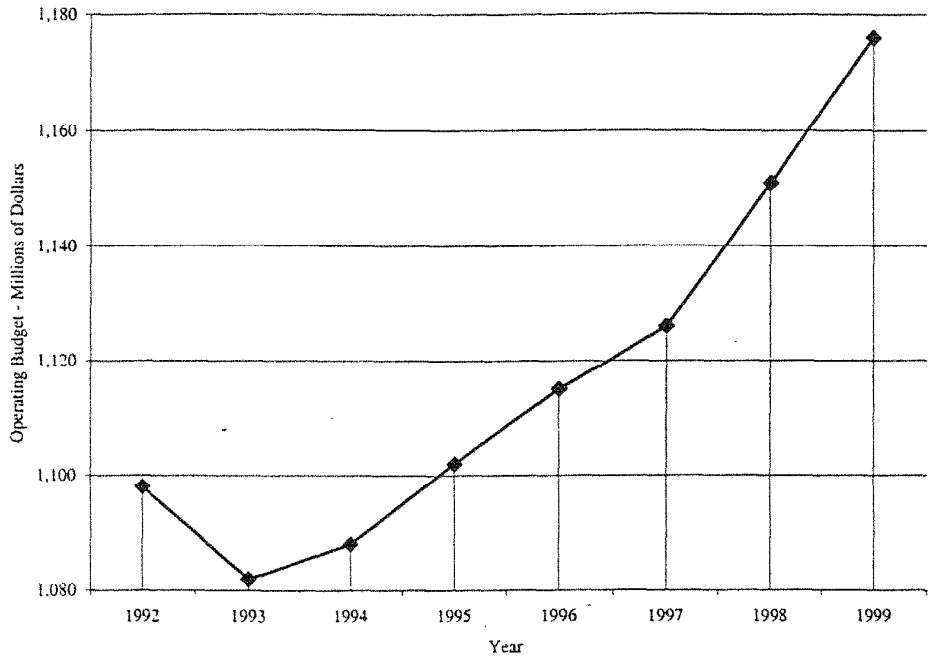


Table 5: 1992-1999 State Parks Share of State Budget

Year	Mean	Median
1992	0.25%	0.22%
1993	0.23%	0.19%
1994	0.22%	0.18%
1995	0.25%	0.19%
1996	0.32%	0.23%
1997	0.25%	0.19%
1998	0.23%	0.18%
1999	0.24%	0.20%

Comparative Analysis

Two additional factors were linked to the previously discussed fiscal issues: size of the state park estate, and number of employees (Table 6). Acreage grew at an annual rate of 1.84 percent over the reporting period. When operational expenditures were applied to acreage there were $98 available per acre in 1992. In 1999, using adjusted 1992 dollars there were $93 available. The decrease of almost $5 per acre (-.76% annual average) is reflective of the increase in acreage in the state park system growing at a rate greater than that of funding.

The number of full-time employees in state park systems has decreased by almost 300 personnel since 1992 (-.27 percent annually). Only in 1995, 1998, and 1999 were increases evident. The number of full-time employees has remained relatively flat as has operating expenditures. Acreage shows a steady increase beginning with 1996. State park agencies have less money and fewer staff per acre then in 1999 then in 1992.

Table 6: Comparative Analysis (1992 Dollars)

Total Area	1992	1993	1994	1995	1996	1997	1998	1999	Average
Operating Expenditures 1992 $	1,098,299,790	1,053,993,056	1,087,901,253	1,102,343,698	1,114,155,121	1,125,659,246	1,150,721,163	1,176,149,237	1,115,846,111
Acres Administered	11,147,594	11,612,090	11,610,084	11,684,937	11,671,020	12,271,641	12,484,046	12,653,569	
Dollars per Acre (1992 $)	$98.52	$90.77	$93.70	$94.34	$95.46	$91.73	$92.18	$92.95	$93.02
% change in acreage		4.17%	-0.02%	0.64%	-0.12%	5.15%	1.73%	1.36%	1.84%
% change in $ per acre		-7.87%	3.23%	0.68%	1.19%	-3.91%	0.49%	0.84%	-0.76%
Total Full-Time Employees	18,883	18,806	18,806	18,844	18,772	18,528	18,530	18,533	18,688
Change in No. of Employees		-0.41%	0.00%	0.20%	-0.38%	-1.30%	0.01%	0.02%	-0.27%

Conclusions

Trends reported in this study would suggest that there are increasing pressures on state park systems. State park operating budgets are minimally keeping pace with inflation. This concurs with Landrum's views, "Although state parks continue to be an important component of state government services, for the past two decades they have found themselves less able to compete effectively with other programs for public funding" (1999; p. 112). While state park operating budgets grew minimally, earned income expectations grew at a greater rate and in some cases replaced other forms of income. It can be expected that earned income will continue to play a large role in the fiscal operations of state parks in the future. Correspondingly, states can expect that general fund and other guaranteed incomes sources will decline. State legislatures and administrative bodies are placing increasing emphasis upon state park systems to be more revenue oriented.

The state park estate is an important component of the larger outdoor recreation estate. It is experiencing many of the same fiscal challenges faced by other public outdoor recreation agencies. State park agencies are responding to such challenges in creative ways. These include privatization, contract management, entrepreneurism, fund raising, grant writing and the like. In all likelihood such endeavors will continue.

References

Brayley, R. E., & McLean, D. D. (in press) Financial management for park, recreation, and sport organizations. Champaign, IL: Sagamore Publishing.

Brayley, R. E., & McLean, D. D. (1998) Privatization of state park lodge systems: A preliminary analysis. State park research report 98-2. Bloomington, IN: State Park Information Resources Center.

Landrum, N. C. (1999) in Outdoor recreation in American life: A national assessment of demand and supply trends. (Cordell, H. K., ed.), Champaign, IL: Sagamore Publishing.

McLean, D. D. (1998) 1st Annual state park forum proceedings. Bloomington, IN: State Park Information Resources Center.

ECONOMIC IMPACTS OF A HERITAGE TOURISM SYSTEM

Charles H. Strauss

Professor of Forest Economics, The Pennsylvania State University, 104 Ferguson Building, University Park, Pennsylvania 16802

Bruce E. Lord

Senior Research Assistant in Forest Resources, The Pennsylvania State University, 206 Ferguson Building, University Park, Pennsylvania 16802

Abstract: US history has often served as a theme for tourism. Within southwestern Pennsylvania, a system of historical sites depicting the region's cultural and industrial heritage was initiated in 1988. The Path of Progress included the renovation of 20 historical sites at a cost of $88.2 million. A five-year study monitored the growth and economic impact of 13-completed sites within the nine-county region.

By 1998, the 13 sites had an annual attendance of nearly 1/2 million visitor days, with 74% coming from non-resident visitors. Regional expenditures by non-resident visitors were $15 million in 1998. Total regional sales impacts from these expenditures amounted to $33 million.

Cumulative sales impacts from the entire system over the first 11 years of operation were $470 million, with 64% originating from non-resident expenditures and 36% from capital expenditures. A comparison of the original sites in 1988 to 1998 operations showed a net gain of $16 million in impacts from non-resident expenditures. More can be expected as the system expands.

Introduction to the Study

History is a popular theme for recreational travel. Tourists are intrigued by their past and the past of others. Consider England's Stonehenge, the Egyptian pyramids, or the Gettysburg battlefield. Our fascination with the past is a tribute to heritage and to time itself.

Various national parks are also time-oriented, with their focus being on geologic time and ecological events. Interwoven within these parks are elements of human history, from our more rudimentary marks to those of advanced societies. Gradually, we have collected and restored these remnants, and interpreted their cultures and heritage.

The industrial and cultural heritage of the US provides another setting for tourism. Williamsburg, Virginia; Sturbridge, Massachusetts; and Mystic, Connecticut have gathered attention to US colonial history. Certain museums have been dedicated to particular technologies; the Ford Museum in Detroit, the Space Museum in Washington, DC and the Steamtown Museum in Scranton, PA. Most of these centers are site-specific and do not address the regional character of heritage development.

In southwestern Pennsylvania, a regional tour system was organized to portray three centuries of heritage development. Its theme commemorates our nation's transition from the farming and extraction trades, through the Industrial Revolution, and on to our current mix of cultures and traditions. The Path of Progress (POP), includes an assembly of over 20 historic sites renovated over a ten-year period, 1988 to 1998, and is considered a prototype for other regional heritage systems.

The following paper presents the general structure of the system, its annual attendance and revenues, and the regional economic impacts generated over a thirteen-year period. Two sources of impact are considered; those organized from the development and restoration of the historic sites and those tied to the annual regional expenditures of non-resident tourists.

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.

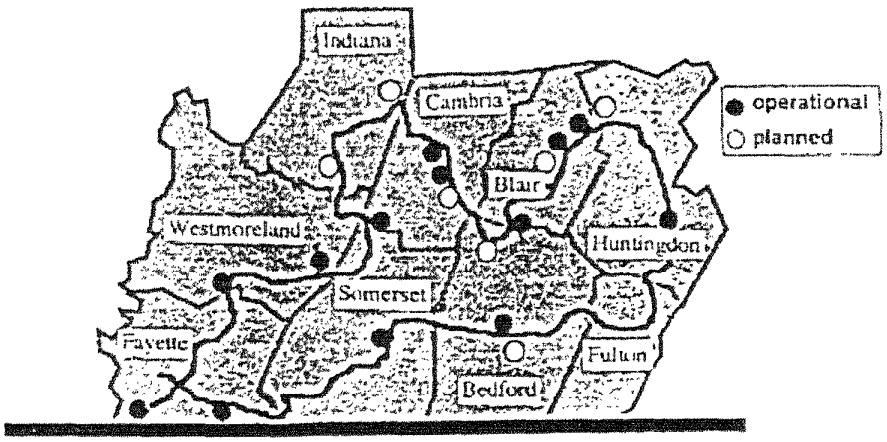
Strauss et al.(1996a) identified the economic impact of tourism within a nine-county region of Pennsylvania during 1995. Tourism was described on the basis of 26 activities, with total attendance amounting to 19.6 million visitor days. Non-resident visitors accounting for 41% of total attendance and $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

This report establishes the sources and magnitude of regional economic impacts from a heritage system located in southwestern Pennsylvania during the period, 1986 to 1998. The system, represented by 13-operational sites, was organized as the Path of Progress (POP) in 1988 under the direction of the Southwestern Pennsylvania Heritage Preservation Commission. The impacts were identified for the nine-county region containing the POP system (Figure 1).

Figure 1
Path of Progress - Tour of 13 Heritage Sites



Two sources of expenditure were considered; regional investments in the planning, restoration, and expansion of the POP system and the regional tourism expenditures made by non-resident visitors to the system. The economic impacts from these expenditures were determined through an input-output model of the region.

The Region and the Path of Progress

The nine counties containing the Path of Progress represent 16% of Pennsylvania's land area (7260 sq. mi.) and 9% of its population (1.1 million) (PSDC 1995) (Figure 1). Nearly 30% of the region is classified as farm land, with another 64% forested (PASS 1996). A prominent geographic feature of the region is the Allegheny Mountains, extending through Somerset, Cambria, and Blair Counties. The Alleghenies were a major obstacle to the settlement of the region during Colonial times and to the industrial development of the US.

Much of the region's history was tied to the early efforts in moving across the Alleghenies, at first by foot and wagons and then by canal and railroad. This transition is a central theme of the POP system, with Fort Necessity and Fort Ligonier representing examples of colonial outposts along the early trail system (Table 1). Other heritage sites, including West Overton Museums, Old Bedford Village, Friendship Hill, and Somerset Historical Center interpret the early agricultural and trade settlements from the colonial and post-Revolution eras.

TABLE 1: Path of Progress Heritage Sites.

1.	Allegheny Portage Railroad	Blair County
2.	Altoona Railroad Memorial Museum	Blair County
3.	East Broad Top Railroad	Huntingdon County
4.	Fort Necessity National Battlefield	Fayette County
5.	Friendship Hill	Fayette County
6.	Horseshoe Curve	Blair County
7.	Johnstown Flood	Cambria County
8.	Johnstown Flood Museum	Cambria County
9.	Johnstown Inclined Plane	Cambria County
10.	Fort Ligonier	Westmoreland County
11.	Old Bedford Village	Bedford County
12.	Somerset Historical Center	Somerset County
13.	West Overton Museum	Westmoreland County

Allegheny Portage was a major engineering feat for the 1830's, when canal boats were lifted over the Alleghenies through an intricate system of inclined planes. However, by 1854, the railroad line which included the Horseshoe Curve was built over the Alleghenies, thus rendering the canal system obsolete. The flooding of Johnstown in 1889, commemorated by the Flood Memorial and the Flood Museum, was linked to a remnant of the early canal system. Following this devastation, Johnstown built its Inclined Plane as a safety measure and to facilitate expansion of the city along its higher elevations

A century of railroad history is the central theme of the Altoona Railroaders Museum, reopened in 1998 as a "state of the arts" heritage center. Forty miles east of this center, tourists can ride the East Broad Top, a narrow-gauge railroad, used in the early 1900's to transport coal and timber from the Alleghenies.

This assembly of heritage sites was formally aligned as the Path of Progress in 1988. POP is marketed as an integral package of heritage sites, permitting tourists to trace three centuries of cultural development in a leisurely, yet systematic, fashion.

Study Procedures

This paper represents a summary of several studies. From 1991 through 1996, a five year series of annual studies established the expenditures and impacts tied to selected heritage sites within the Path of Progress (Strauss et al. 1992–1996). Economic impacts of visitor expenditures and capital investments were analyzed with a regional input-output model. This year-by-year evaluation of individual sites led to an analysis of the complete system involving 13-operational sites (Strauss et al. 1996). Allied with this effort was the development of a monthly attendance reporting system for all sites. Several heritage centers were re surveyed in 1997 and 1998 as a companion effort to a larger tourism study of the region (Strauss et al. 1996a). Capital investments within the POP system over the 1986-1998 period were provided by the Commission (King 1998).

In approaching this paper, the five-year series of impact studies was used as a base for interpreting the impact of the entire system over a 13-year span, 1986 to 1998. This span includes a two-year period of operations prior to the formal creation of the Path of Progress (1988), followed by eleven-years of POP operations. As previously identified, a systematic collection of attendance was maintained for all sites since 1991. Attendance for the 1986 to 1990 period was established from National Park Service records of four NPS sites (Allegheny Portage, Fort Necessity, Friendship Hill, and the Flood Memorial) and similar records for the Railroaders Museum, Horseshoe Curve, and Old Bedford Village. The attendance at all other sites during the 1986-1990 period was based on the trends developed from the previously noted sites.

In a similar fashion, the trend in the ratios of resident to non-resident visitations for the 1991 to 1998 period for each of the 13 sites was used to estimate their probable individual ratios during the earlier period. Expenditure profiles for resident and non-resident visitors at the 13 sites were evaluated in the same manner.

The economic impacts of non-resident and capital expenditures were generated by the Impact Analysis for Planning (IMPLAN) system. IMPLAN is a computerized modeling system providing a regional input-output analysis of economic activity in terms of 10 industrial groups involving as many as 528 sectors. The system is currently maintained by MIG, Inc. and is available on a fee basis (MIG, Inc. 1998). IMPLAN's data bases are periodically updated, with the earliest of the POP studies based upon 1986 US data and the more recent using a 1993 economic base. In addition, the nine-county model was updated by our research team to include changes in employment within key industries and allied trade relationships.

Results

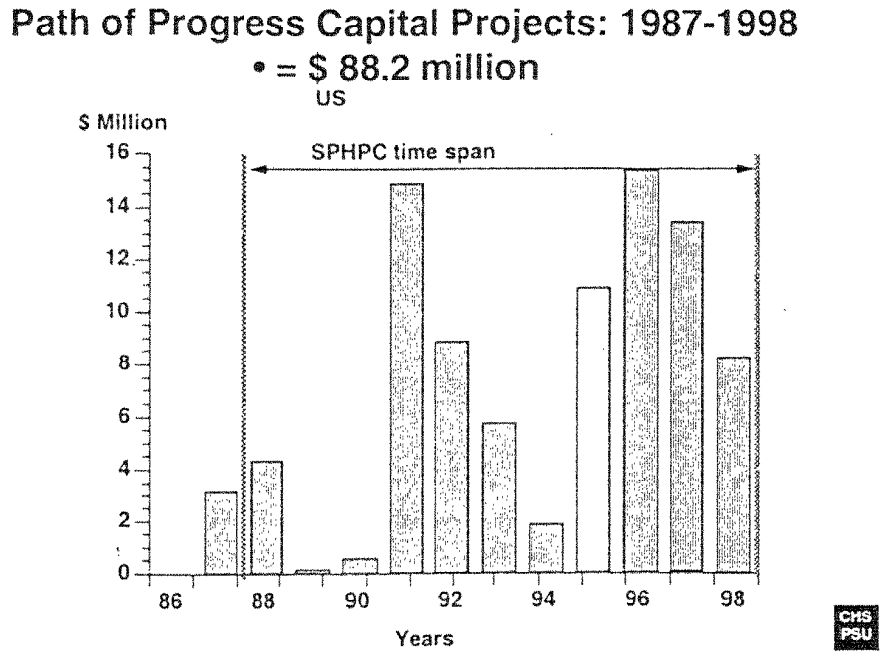
Capital Expenditures

One of the guiding principles behind POP was building and preserving a creditable system of historic sites that accurately portrayed the region's history. Both the technical and cultural attributes of the region's growth were considered. The system included private and public sites within its interpretative process. The selection of sites by the Southwestern Pennsylvania Heritage Preservation

Commission was accompanied by development plans that furthered the preservation, interpretation, and capacities of the various sites.

In total, $88.2 million was spent within the region on the design, restoration, and expansion of the POP system (Figure 2). Nearly 70% was directed to the initial set of 13 operational sites, allied components of these sites, and related POP infrastructure. The remaining 30% was used in the restoration and development of additional sites for the future system. Among the latter will be an operational coal mine in Cambria County, expanded canal projects in Blair and Indiana Counties, and a transportation heritage center in Bedford County.

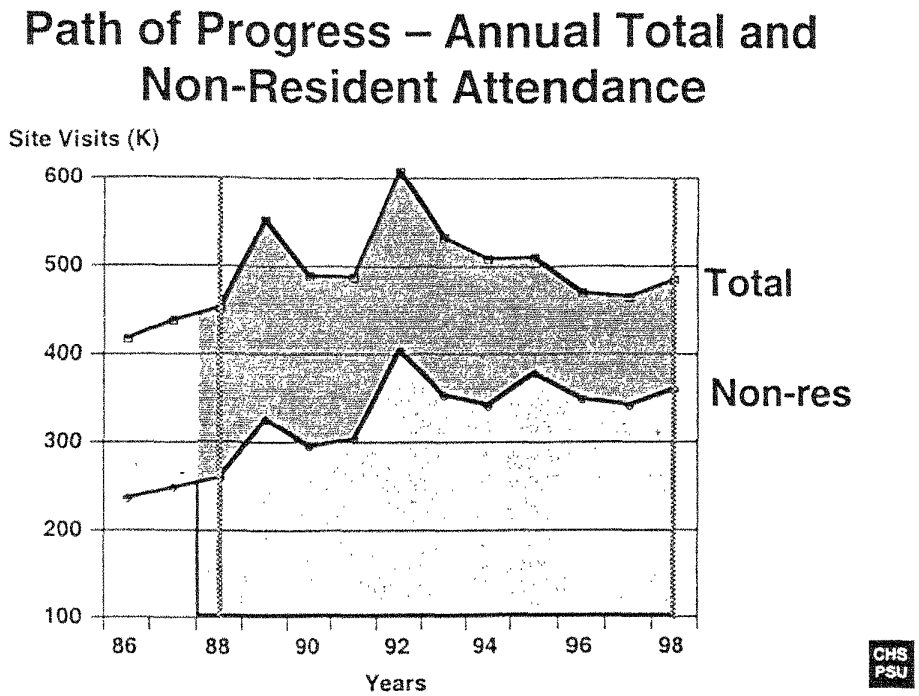
Figure 2



Attendance

During the two years prior to the advent of the Heritage Commission, annual attendance at the 13 existing sites averaged 430,000 visitor days (one person's visit over some portion of a day) (Figure 3). Nearly 57% of the attendance was from visitors outside the nine-county region (non-residents). Nearly 80% of the non-resident and total attendance, was registered at the Inclined Plane, the Flood Memorial and Museum, Fort Necessity, Fort Ligonier, Old Bedford Village, and the Horseshoe Curve.

Figure 3



The first major increase in attendance occurred in 1989 with the opening of the renovated Johnstown Flood Memorial and Flood Museum. Attendance at the Memorial nearly tripled, to 104,000 visitor days, and at the nearby Flood Museum, it more than doubled. Usage of the Inclined Plane also increased. Nearly all of the increased attendance for the POP system was from the three Johnstown sites. In the following year, the overall system experienced a 60,000 decline in visitations. Although attendance at the Johnstown sites was lower, it was still 50% higher than before the renovations.

The next surge in attendance took place in 1992, marking the dedication of the new Horseshoe Curve facility. Total attendance at Horseshoe exceeded 120,000 visitor days, representing a four-fold increase from its previous annual attendance. However, attendance tapered to 80,000 in the following year and has further declined to 55,000 visitor days in the more recent years. Over this period, non-resident attendance has increased, moving from 70% of the total attendance in 1990-91 to over 80% in 1997-98.

Total annual attendance for the entire system over the 1993-98 period has declined, dropping below 500,000 visitor days in 1996 but showing some increase in 1998 (485,000). Once again, the dedication of a new center, this time the Railroader's Museum in Altoona in 1998, caused a doubling of attendance at this site.

Non-resident attendance at all sites has also increased over this period, moving from 66% in 1993 to 75% in 1995 and holding at this level in 1998 (Figure 3). The system has had three peaks in non-resident attendance; 400,000 plus in 1992, 380,000 in 1995, and 360,000 in 1998. From its initial base in 1986-87, non-resident attendance grew at an average annual rate of nearly 11% to the first peak in 1992. Since then, the system has experienced an average annual decline of 2% in non-resident attendance.

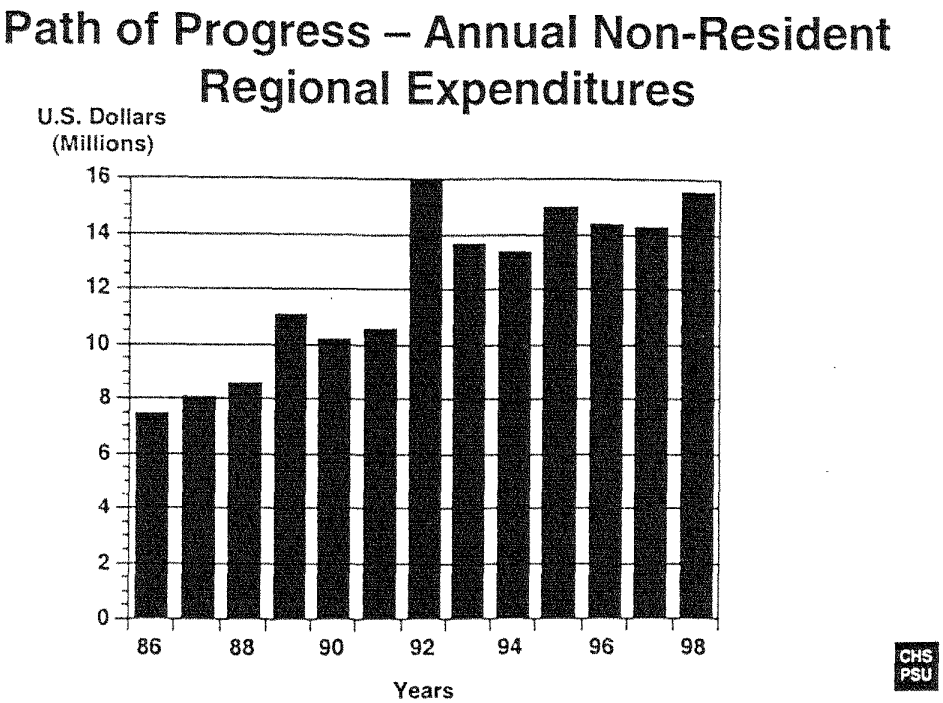
Non-Resident Expenditures

The primary force behind tourism impacts is the volume and type of expenditures from non-resident visitors. In essence, these expenditures represents an influx of "new" money to a regional economy through the export of recreational services. The financial response of the various sectors to these expenditures determines the various levels of direct, indirect, and induced impacts (Strauss et al. 1996a).

As might be expected, annual non-resident expenditures from the POP system (Figure 4) paralleled the growth in non-resident attendance. Before the POP system was formally organized, non-resident expenditures averaged $7.7 million annually during the 1986-87 period. After POP was developed, expenditures climbed to $11 million in 1989, marking the dedication of the Flood Memorial and Museum. A second peak of $16 million was realized in 1992, when the new Horseshoe Curve facility was brought "on-line". Following 1992, expenditures declined, but held

within the range of $14 to $15 million per year. The dedication of the new Railroader's Museum in 1998 raised non–resident expenditures to the $16 million level.

Figure 4



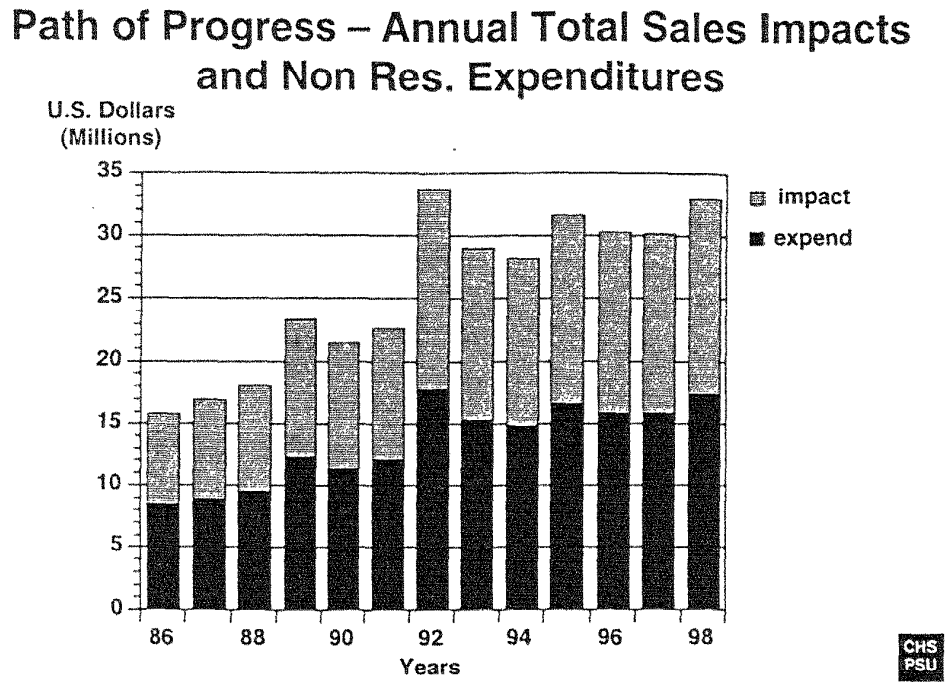
Economic Impacts

For purposes of this study, economic impacts were divided into those originating from capital expenditures on site development and those tied to non-resident tourist expenditures. Each source was identified in terms of its total sales impact, which includes the build of direct, indirect, and induced impacts within the regional economy.

Capital expenditures were separated into planning-design and restoration-construction phases for each project. On average, this division was 18% and 82%, respectively, with each component analyzed separately within the IMPLAN model. The regional impact of the $88.2 in capital expenditures totaled $168.5 million over the course of the 13-year period. This represented an average expenditure to total sales multiplier of 1.91. For the most part, these expenditures returned about 94% of their value as direct impacts. In turn, the direct impacts generated about 54% of their value as indirect impacts to other industrial sectors within the region. Finally, the induced impacts developed from the wage and salary component of the direct and indirect impacts represented about 32% of the total impacts.

The trend in annual impacts from non-resident expenditures (Figure 5) followed the pattern displayed by the expenditures themselves (Figure 4). Impacts for 1986 and 1987 averaged $16.5 million annually. During 1989, which marked the inauguration of the Flood Memorial and Museum, total impacts from non-resident expenditures at all sites increased to $23.4 million. A second peak was recorded in 1992, when the new Horseshoe Curve was brought on-line. Total regional impacts from all sites during this year were $33.8 million. Although annual impacts decreased to $28.2 million in 1994, the following years showed a gradual increase, with 1998 impacts estimated at $33.0 million.

Figure 5



The general pattern for non-resident expenditures shows about 75% remaining within the regional economy as direct impacts. These impacts were largely placed within the retail sectors serving tourists (lodging, food services, and allied products and services). The remaining 25% of expenditures was tied to the purchase of imported goods and services and, therefore, lost to the regional economy.

The next level of impacts represent the trade between the direct sectors and other regional businesses. Overall, indirect impacts were 32% of the value registered as total direct impacts. The induced impact were 110% of the combined value of direct and indirect impacts. The substantial size of induced impacts was caused by two factors; the labor-intensive nature of most tourist-related trades and a similar dependency among most retail and service sectors that meet household needs.

Impacts – Summary and Allocations

The 11-year total for tourist expenditure impacts was $301.8 million. An additional $168.5 million in impacts was generated by the capital expenditures in site development, leading to a grand total of $470.3 million.

Crediting this impact to the POP system might be questioned, since each of the sites did exist prior to the POP system. One approach for estimating the "net gain" credited to the POP system would be subtracting the pre-POP impacts ($16.5 million per year) from those recorded over the past 11 years. Using this approach, the total "net" gain in impacts over the 11-year period amounted to $120.9 million, or about $11 million per year. These annual net gains have increased over time, with 1998 having a net impact of $16.5 million.

Summary and Conclusions

Have the capital expenditures used in the restoration and expansion of the POP system proven to be a sound investment? In approaching this question, several financial aspects of the system might be considered. First, the total capital investments of $88.2 million fostered additional economic activity within the region, with an impact estimated at $168.5 million. The refurbished and expanded system gathered a larger attendance over its ensuing 11 years of operation. As previously identified, this net gain in impacts from tourist expenditures was $120.9 million. As such, the $88.2 million in capital investments generated impacts of $168.5 million, plus an added net gain of $120.9 million in tourism-related impacts, for a total of $289.4 million. This represents over a three-fold gain from the original investments.

However, these comparisons are somewhat misleading in that impacts are only a measure of gross economic activity and do not specify the profits earned by such investments. At best, we know that certain levels of gross economic activity were generated by these investments. Whether this amount of activity was sufficient to warrant the original investments is not resolved herein, and may be more of a policy issue . However, these impacts will continue into the future and should increase as the POP system is

expanded. These gains can be measured and should be added to any policy-related equations.

Acknowledgment

This research was sponsored by the Southwestern Pennsylvania Heritage Preservation Commission, Box 565, Hollidaysburg, PA. 16648.

References

Bergstrom, J. C., H. K. Cordell, A. E. Watson and G. A. Ashley. 1990. Economic impacts of state parks on state economies in the south. Southern Journal of Agricultural Economics. December 1990. pp. 69-77.

Fesenmaier, D. R., L. Jones, S. Um and T. Ozuna, Jr. 1989. Assessing the economic impact of outdoor recreation travel to the Texas gulf coast. Journal of Travel Research. 28(1): 18-23.

Johnson, R. L., F. Obermiller and H. Radtke. 1989. The economic impact of tourism sales. Journal of Leisure Research. 21(2): 140-154.

King, C. 1998. Summary of Capital Projects for the Path of progress – 1988 to 1998. Correspondence from SPHPC. August 1, 1998. 4 p.

MIG, Inc. 1996. IMPLAN News, Issue No. 17. May, 1996. MIG, Inc. Stillwater, MN 6p.

Pennsylvania Agricultural Statistics Service. 1996. 1994-1995 Statistical Summary and Annual Report PASS - 117. Pennsylvania Agricultural Statistics Service. Harrisburg, PA 123 p.

Pennsylvania State Data Center. 1995. 1994 Pennsylvania Abstract. Pennsylvania State Data Center. Harrisburg, PA 293 p.

Stoll, J. R., J. C. Bergstrom and L. L. Jones. 1988. Recreational boating and its economic impact in Texas. Leisure Sciences. 10, pp. 51-67.

Strauss, C. H., B. E. Lord, and S. C. Grado. Annual series: 1992, 1993, 1994, 1995, 1996. An Economic Assessment and Visitor Profile Study of the Heritage Project within Southwestern Pennsylvania. Part 1: Economic Impacts and User Expenditures from Selected Heritage Visitor Centers. Annual series of reports to Southwestern Pennsylvania Heritage Preservation Commission. Penn State University. University Park, PA.

Strauss, C. H., B. E. Lord and S. C. Grado. 1996a. IMPLAN analysis of travel and tourism in southwestern Pennsylvania. IN: Proceedings of the National IMPLAN User's Symposium. Minnesota IMPLAN Group, Inc. and University of Minnesota. pp 240 - 266.

SPENDING PRIORITIES FOR OUTDOOR RECREATION PLANNING IN NEW HAMPSHIRE: IMPLICATIONS FOR MANAGERS

Al Williams, Ph. D., Department of Recreation Management and Policy, University of New Hampshire, Durham, NH 03824

Sam Lankford, Ph. D., Leisure Services Division, School of Health, Physical Education, and Leisure Services, University of Northern Iowa, Cedar Falls, IA 50614

Robert A. Robertson, Ph. D., Department of Resource Economics and Development, University of New Hampshire, Durham, NH 03824

Abstract: Managers and planners responsible for the development of natural resources in a state need access to data that allows for informed decision making. With data of this type managers and planners can institute appropriate resource management programs. Such data can also be used to inform and educate local, state, and federal policy makers with respect to budgetary decisions. Such a process allows decisions made by policy makers to reflect the importance of natural and cultural resources to citizens in a given state. The purpose of this research was to collect information from a random sample of New Hampshire residents that would help improve the outdoor recreation and resource management programs in New Hampshire. One aspect of this research was to determine resident preferences for the funding of specific programs and projects.

Introduction

Douglass (1993) noted that "planning is the scheme or program for making, doing, or arranging something. It is the method for proceeding. Planning for forest recreation is arranging for the intelligent use of resources in providing satisfactory facilities and areas to meet present and future recreation needs" (p. 73). Outdoor recreation managers and planners can enhance the effectiveness of resource management and development by monitoring the resource and facility demands of participants in a wide range of outdoor recreation activities. Such a process helps to determine the types, quantity, location, and timing of recreation development. In general management requires an overall strategy and series of actions to achieve goals and objectives set by the agency (Hendee, Stankey, & Lucas, 1978). According to Jubenville and Twight (1993), there is a need to effectively and objectively analyze public input with respect to managerial decision making. They further suggested that the need for public involvement in decision making stems from the outgrowth of the environmental movement in the late 1960s and 1970s. The public demand to be heard eventually resulted in the institutionalization of policy that required agencies to air issues of resources use before the affected public.

Related to demand for public involvement in policy decisions is the increasing popularity of outdoor recreation in the United States (Bergstrom & Cordell, 1991). This increase in popularity will ensure that resource management agencies, legislators, and non-governmental interest groups will become more involved in the planning process. A concurrent problem associated the popularity of outdoor recreation, which suggests a need for effective and efficient planning, is the growth in the amount of services provided by recreation agencies. According to Crompton (1998) parks and recreation agencies at all levels of government provide more services, oversee more park acreage, and deal with increased levels of crime and vandalism than they did 10 to 20 years ago. Concomitant with these increased levels of responsibility has been the decrease in the number of full time staff members in many agencies.

Managers also need to involve the public in planning decisions because of the many and varied perceived benefits and impacts associated with recreational development. Lankford, Williams, and Knowles-Lankford (1997) reported that tourism and recreation development are often viewed by governmental jurisdictions as a tool for economic development. These authors noted that support for recreation development is primarily determined by one's perception about the adequacy of and access to personal leisure opportunities in the outdoors. Viewing recreation as a stand alone economic development strategy may result in more problems than solutions (Keith, Fawson, & Chang, 1996). In a study conducted in Utah these authors found that communities which primarily rely on tourism and recreation to maintain economic viability generally experience greater annual employment variability than do communities with other economic bases. They suggest that the variability of recreational employment may indicate a need for sound fiscal planning which would allow the community to weather boom and bust cycles. In essence planning can be viewed as a critical component for all park and recreation agencies due the increased pressures they face. Many would argue that recreation resource planning is more important today that at any other time in the past 50 years (McLean, Bannon, & Gray, 1999).

This paper examines spending priorities for outdoor recreation planning in the State of New Hampshire. It is

believed that outdoor recreation managers and planners can pursue more effective means of monetary resource allocation by monitoring how residents rank programs and projects related to outdoor recreation in their respective states. To that end managers and planners responsible for the development of natural resources in a state need access to data that allows for informed decision making. With data of this type managers and planners can institute appropriate resource management programs. Such data can also be used to inform and educate local, state, and federal policy makers with respect to budgetary decisions. Such a process allows decisions made by policy makers to reflect the importance of natural and cultural resources to citizens in a given state.

Purpose

The purpose of this research was to collect information from a random sample of New Hampshire residents that would help improve the outdoor recreation and resource management programs in New Hampshire. The study addressed a number of issues related to outdoor recreation. Four overall objectives were pursued: (a) resident participation in outdoor recreation activities for a one year period, (b) identification of natural and community resources utilized by respondents in specific outdoor recreation activities, (c) identification of perceived benefits associated with outdoor recreation, and (d) resident preferences for specific outdoor recreation management and development initiatives. One aspect of objective "d" as described above was to determine resident preferences for the funding of specific programs and projects. The information presented in this paper is de-limited to the respondents preferences for the funding of specific programs and projects in the state of new Hampshire.

Methods

One of the first steps in the research design process was to establish an advisory committee. The resulting group, the Statewide Comprehensive Planning Advisory Committee, made up of representatives from 12 agencies or organizations (state, federal, non-governmental) was charged with developing the survey instrument. The survey consisted of six pages of likert type scales and close ended questions which addressed the research objectives noted above. The final section of the survey consisted of demographic information. The resulting questionnaire was mailed to a sample of 3,000 households. This sample was drawn randomly from listing of persons licensed to drive in New Hampshire. A total of 928 usable surveys were returned resulting in a response rate of 30.1 percent.

Results

With regard to spending priorities for outdoor recreation in New Hampshire, respondents were asked to rate how future monies should be spent. Twenty-two different programs and or projects were rated as low, moderate, or high priority with respect to allocation of future monies. Findings indicated that high priority programs and projects included things like (a) preservation / restoration of native wildlife, (b) wetland preservation / protection programs, and (c) enforcement of environmental laws. Items that received moderate priority were things like (d) improved maintenance of existing park facilities, (e) safety and law enforcement programs in outdoor recreation areas, and (f) enhancement of fish and game stocks. Low priority items included things like (g) providing more facilities for outdoor recreation activities, (h) providing incentives to encourage provision of outdoor recreation opportunities on private timber lands, and (i) marketing outdoor recreation opportunities to residents.

Respondents were also asked to identify the top three priorities for New Hampshire State Government and the top three priorities for New Hampshire Non-Profit Organizations and Foundations. The top three priorities reported for state government were (1) protection / improvement of water quality in rivers, streams, lakes, and ponds; (2) preservation / restoration of native wildlife; and (3) enforcement of environmental laws. The top three priorities reported for non-profit organizations were (1) volunteer environmental monitoring programs; (2) protection and enhancement of cultural and historic resources; and (3) acquisition of lands for conservation / open space and habitat protection.

Discussion

This research, in establishing a baseline of information, suggests that residents of New Hampshire value the protection of natural resources as they relate to the provision of outdoor recreation experiences. As reported above, items ranked as high priority relate primarily to the preservation and protection of native flora and fauna. Also given high priority was enforcement of laws related to environmental issues. Most respondents felt that providing more outdoor recreation facilities and marketing outdoor recreation opportunities to residents, both of which would arguably increase use, were not overly important.

References

Bergstrom, J. C. & Cordell, H. K. (1991). An analysis of the demand for and value of outdoor recreation in the United States. Journal of Leisure Research, 23(1), 67 - 86.

Crompton, J. L. (1998). Forces underlying the emergence of privatization in parks and recreation. Journal of Park and Recreation Administration, 16(2), 88 - 101.

Douglass, R. W. (1993). Forest recreation. (4th ed.). Prospect Heights, IL: Waveland Press.

Hendee, J. C., Stankey, G. H., & Lucas, R. C. (1978). Wilderness management. United States Department of Agriculture: Miscellaneous Publication No. 1365.

Jubenville, A. & Twight, B. W. (1993). Outdoor recreation management: Theory and application. (3rd ed.). State College, PA: Venture.

Keith, J., Fawson, C. & Chang, T. (1996). Recreation as an economic development strategy: Some evidence from Utah. Journal of Leisure Research, 28(2), 96 - 107.

Lankford, S. V., Williams, A., & Knowles-Lankford, J. (1997). Perceptions of outdoor recreation opportunities and support for tourism development. Journal of Travel Research, 35(3), 65 - 69.

McLean, D. D., Bannon, J. J., & Gray, H. R. (1999). Leisure resources: Its comprehensive planning. (2nd ed.). Champaign, IL: Sagamore.

DETERMINING ECONOMIC IMPACT THROUGH SECONDARY DATA

Hans Vogelsong

East Carolina University, Department of Recreation and Leisure Studies, 174 Minges, Greenville, NC 27858

Alan Graefe

The Pennsylvania State University, Leisure Studies Program, 201 Mateer Building, University Park, PA 16802

Abstract:

Economic impact studies have proven to be a valuable tool to resource managers and planners. Not only can these studies help garner public support for proposed facilities or events, but they can also help to determine what actions or plans are the most economically feasible. However, determining economic impact requires data concerning visitor behavior and spending characteristics. The purpose of this study was to determine the economic impact of several proposed trail development alternatives within the Delaware Water Gap National Recreation Area (DWGNRA). Unfortunately, little data on land based visitors to the park was available, and time constraints made collecting new data unfeasible. This paper describes the methods used in calculating the economic impact of the proposed trail alternatives through extrapolating secondary data from similar areas to the users of the DWGNRA.

Introduction

The economic impact figures of recreational facilities, services and events are valuable assets to recreational managers and planners. Not only can these figures help garner public support for proposed facilities or events, but they also help determine what actions or plans will provide the most benefits to an agency or local region. Despite the popularity of these figures, determining the economic impact of recreational services or facilities can be a time consuming and expensive endeavor due to the collection and analysis of expenditure and behavior data derived from a sample of visitors. These data parameters can become increasingly difficult when there is very little time to collect data, and when little or no existing baseline data is available for the specific set of visitors in question. One possible solution to this problem is to estimate economic impact through the use of secondary data and sources. This involves the extrapolation of spending averages from previous studies to a new site of interest. The purpose of this paper is to provide a case study example of how this methodology was used to estimate the economic impact of three trail development alternatives at the Delaware Water Gap National Recreation Area (DWGNRA).

The DWGNRA Case Example

An economic impact analysis for three trail development alternatives at the DWGNRA was required as part of a larger environmental impact assessment. Due to time constraints that eliminated the opportunity to collect expenditure data from visitors, as well as the fact that very little data concerning the behavior of trail users to the area existed, the methodology of extrapolating secondary data from outside sources to the park was selected. This process included three distinct stages:

1. Estimate the number of trail users for each trail development alternative.
2. Estimate the average per person-per day expenditure figure for trail use.
3. Apply the per person-per day expenditure figures to the estimated trail users at the DWGNRA.

The first two of these stages relied on a thorough search of the literature and data available for similar studies concerning the economic impact of recreational trails. The third stage merely required that the figures from the first two stages be combined to estimate total economic data for trail use at the DWGNRA.

Estimating Trail Use

One difficulty that was immediately apparent in determining the number of trail users for the park was that there was very little data available concerning trail use at the DWGNRA. Therefore, a combination of visitor center counts, literature review, and park staff estimates were used to estimate the current or baseline total number of trail users. These figures are also used for the first trail development alternative, which was to keep the system "as is" with no further development. A breakdown of this estimate is provided in Table 1.

Table 1. Total Estimated Number of Trail Users at DWGNRA

Trail Activity	Number of Users
Foot Users	180,925*
Bicyclists	3,500**
Horse Users	500**
Total	184,925

* Based on formula derived from visitor center counts and literature review

** Based on park staff estimates

The figures represent use over 102 miles of trails that include:

- 102 miles of hiking trails, accounting for 1,774 hikers per mile of trail
- 12 miles of trails allowing horses, accounting for 42 horse users per mile where allowed
- 14 miles of trails allowing bicycling, accounting for 250 bikers per mile of trail where allowed

To estimate the number of trail users for the other two trail development alternatives, the number of hikers and horse

users per mile of trail were extrapolated to the new miles of trail for each alternative. However, for both of these alternatives, the changes to the trail system should make the park a much more attractive destination for bicyclists. Although bicycles are permitted on a few trails in the current situation, these trails are all rather short, and were not designed for bicycle use. Several of the new trails in this system are designed as multi-use trails and should attract more cyclists to the DWGNRA. The earlier estimate of 3,500 cyclists using the current trail system is not adequate to extrapolate to the new trail development because it does not adequately reflect the character of the new trails. Therefore, sources outside the DWGNRA were used to determine how many cyclists these new trails will attract. Mowen's (1994) study of users of the Mount Rogers National Recreation Area was chosen for this purpose because it is similar to the DWGNRA in that they are both National Recreation Areas within short distances of metropolitan areas. Furthermore, they both contain a wide variety of trails that are used for a number of different activities. Mowen found that Mount Rogers trail users were comprised of an equal number of hikers and bicyclists. By extrapolating these figures to the estimate of hikers on those trails that also allow bicyclists in the DWGNRA, the total number of bikers can be estimated.

Since the earlier estimate of trail use at the DWGNRA was made up of 180,925 hikers over the 102 miles of trail, and 500 horse users over the 12 miles of horse trails included in alternative 1, it was assumed that each mile of trail draws 1,774 hikers, and 42 horse users per year. These figures were extrapolated to the miles of new trails in each respective alternative. In addition, the number of bicyclists (where appropriate) was assumed to be equal to the number of hikers for those trails allowing both uses. Tables 2 and 3 provide a breakdown of the trail use by activity type for alternatives two and three respectively. These estimates will later be used to determine total visitor spending by alternative.

Table 2. Estimated Number of Trail Visits for Alternative 2.

	Existing Trails (Alternative 1)	New Foot Traffic Only Trails	New Foot Traffic and Bike Trails	New Foot Traffic and Horse Trails	Total Trails
Mileage	102	24	91	7	224
Hikers	180,925	42,576	161,434	12,418	397,353
Bicyclists	3,500	0	161,434	0	164,934
Horse users	500	0	0	294	794
Total Users	184,925	42,576	322,868	12,712	563,081

Table 3. Estimated Number of Trail Visits for Alternative 3.

	Existing Trails (Alternative 1)	New Foot Traffic Only Trails	New Foot Traffic and Bike Trails	New Foot Traffic and HorseTrails	Total Trails
Mileage	102	21	55	0	178
Hikers	180,925	37,254	97,570	0	315,749
Bicyclists	3,500	0	97,570	0	101,070
Horse users	500	0	0	0	500
Total Users	184,925	37,275	195,195	0	417,395

Estimating Expenditures

In order to estimate the expenditures of DWGNRA trail users, spending data from previously completed studies was extrapolated to the DWGNRA. Nine of the economic impact studies which summarize findings at 34 separate trails contained figures for per-person/per day spending. After using a consumer price index to convert these figures to 1995 dollars, an average was taken as a base figure to estimate per person/per day expenditures for DWGNRA trail visitors. Table 4 provides a summary of how this estimate was calculated.

Although the total expenditures per visitor is a useful figure, it can become more valuable if broken down into various expenditure categories. To accomplish this, further extrapolation was necessary. Four studies in the literature review contained economic data from trail users that provided a breakdown of expenditures by category. The percentage of the total expenditures for each spending category was calculated for each study (Table 5) and the average of these was applied to the $12.85 total spending figure calculated earlier. Table 6 provides estimates of trail user expenditures by expense categories.

Table 4. Summary of Per Person/Per Day Expenditure Data

Trail	State	Date	Per Person/Per Day Expenditures	1995 Dollars
Oil Creek State Park Bike Trail	PA	1990	$25.86	$30.91
North Central Rail-Trail	MD	1994	$6.30	$6.46
Heritage Trail, St Marks Trail, Lafayette Trail	IA, FL, CA	1992	$7.60	$8.27
6 Minnesota State Trails	MN	1990-91	$5.39	$6.44
19 Illinois Bike Trails	IL	1990	$7.95	$9.50
Elroy-Sparta Trail	WI	1989	$14.88	$18.64
Sugar River Trail	WI	1986	$9.04	$12.45
2 Mount Rogers NRA Trails	VA	1994	$17.20	$17.65
Ghost Town Trail	PA	1996	$5.46	$5.33
Average			$11.07	$12.85

Table 5. Percentage of Expenditures Per Category

	Trail				
	Mt Rogers	Heritage, St Marks, and Lafayette Trails	Oil Creek State Park Bike Trail	Ghost Town Trail	Average
Expense Category	%	%	%	%	%
Food					
Restaurants	10	30	NA	NA	20
Other Food and Beverage	11	13	NA	NA	12
Food Total	21	43	35	44	36
Lodging					
Hotel/Motel	20	6	NA	NA	13
Camping	5	2	NA	NA	3.
Lodging Total	25	8	10	3	11.5
Transportation	8	30	24	35	24
Retail Purchases	25	11	24	10	17.5
Attractions and Entertainment	6	3	7	0	4
Other	15	6	0	8	7

Table 6. Estimated Expenditures Per Person/Per Day by Expense Category for DWGNRA

Expense Category	%	Amount
Food		
Restaurants	22.5	$2.89
Other Food and Beverage	13.5	$1.73
Food Total	36	$4.62
Lodging		
Hotel/Motel	9.3	$1.20
Camping	2.2	$.28
Lodging Total	11.5	$1.48
Transportation	24	$3.08
Retail Purchases*	17.5	$2.25
Attractions and Entertainment	4	$.51
Other**	7	$.90
Total	100	$12.85

**There is very little literature stating what "Retail Purchases" includes. The assumption will be made that this category includes such items as Souvenirs, clothing, film and developing, and durable goods such as bicycle parts, hiking gear, or horse tack.*

***The "Other" category is usually used as a catch-all for respondents who have a difficult time fitting their purchases into one of the expenditure categories on the survey. This item is difficult to interpret and should only be used for the calculation of the total expenditures.*

The literature also supports the notion that different types of users spend differing amounts while visiting trails. In the studies that examined differences in expenditures between different trail user groups, it was found that on average foot users spent 89% as much as the "average" users, horse users spent 98% as much, and bikers spent 144% as much. These percentages were then applied to estimated spending averages to determine spending by different activity groups as shown in Table 7.

Table 7. Expenses Per Person/Per Day by Activity Type for DWGNRA

Expense Category	Foot Users	Bikers	Horse Users	Weighted Average
Food				
Restaurants	$2.57	$4.16	$2.83	$2.89
Other Food and Beverage	$1.53	$2.49	$1.70	$1.73
Food Total	**$4.11**	**$6.65**	**$4.53**	**$4.62**
Lodging				
Hotel/Motel	$1.07	$1.73	$1.18	$1.20
Camping	$.25	$.40	$.27	$.28
Lodging Total	**$1.32**	**$2.13**	**$1.45**	**$1.48**
Transportation	**$2.74**	**$4.44**	**$3.02**	**$3.08**
Retail Purchases	**$2.00**	**$3.24**	**$2.21**	**$2.25**
Attractions and Entertainment	**$.46**	**$.73**	**$.50**	**$.51**
Other	**$.80**	**$1.30**	**$.88**	**$.90**
Total	**$11.43**	**$18.50**	**$12.59**	**$12.85**

Determining Economic Impact from Trail Use at DWGNRA

To determine the economic impact of trail users at the DWGNRA, the number of users was multiplied by expenditures and weighted by activity type. This was accomplished for each of the various trail alternatives. For alternative one, which was to stay with the current situation, trail use in the DWGNRA accounted for $2,137,173.50 spent in the local economy. This figure was derived by multiplying the number of users from each activity group (Table 1) by their respective per person/per day expenditures (Table 7), and adding the totals. A complete breakdown of how this figure was reached, as well as expenditures per category can be found in Table 8.

Table8. Economic Impact resulting from the current use of trails at the DWGNRA

		Foot Users	Bikers	Horse	Total Expenditures
		n=180,925	n=3,500	n=500	
Food		Per Person/Per Day expenditures			
	Restaurants	$2.57	$4.16	$2.83	$480,952.25
	Other F&B	$1.53	$2.49	$1.70	$286,380.25
Food Total		**$4.10**	**$6.65**	**$4.53**	**$767,332.50**
Lodging					
	Hotel/Motel	$1.07	$1.73	$1.18	$200,234.75
	Camping	$0.25	$0.40	$0.27	$46,766.25
Lodging Total		**$1.32**	**$2.13**	**$1.45**	**$247,001.00**
Transportation		$2.74	$4.44	$3.02	$512,784.50
Retail Purchases		$2.00	$3.24	$2.21	$374,295.00
Attractions & Entertainment		$0.46	$0.73	$0.50	$86,030.50
Other		$0.80	$1.30	$0.88	$149,730.00
Total		**$11.42**	**$18.49**	**$12.59**	**$2,137,173.50**

Both Alternative two and three included extensive trail development and additions to the current situation expressed as alternative one. It was anticipated that these alternatives would generate an increase in trail use which was estimated in Tables 2 and 3. To estimate the economic impact resulting from this increased use, the same procedure of multiplying the number of users from each activity group by their respective per person/per day expenditures and adding the totals was followed for both alternatives two and three. The results of these respective procedures are depicted in Tables 9 and 10.

Table 9. Estimated Trail Related Expenditures for Alternative 2.

	Current Use Alternative 1	New Foot Traffic only Trails	New Multiple Use Trails				
Expense Categories		Foot Users n=42,576	Foot Users n=173,852	Bikers n=161,434	Horse n=294	New Trails Subtotal	Total Expenditures
Food							
Restaurants	$480,952.25	$109,420.32	$446,799.64	$671,565.44	$832.02	$1,228,617.42	$1,709,569.67
Other F&B	$286,380.25	$65,141.28	$265,993.56	$401,970.66	$499.80	$733,605.30	$1,019,985.55
Food Total	**$767,332.50**	**$174,561.60**	**$712,793.20**	**$1,073,536.10**	**$1,331.82**	**$1,962,222.72**	**$2,729,555.22**
Lodging							
Hotel/Motel	$200,234.75	$45,556.32	$186,021.64	$279,280.82	$346.92	$511,205.70	$711,440.45
Camping	$46,766.25	$10,644.00	$43,463.00	$64,573.60	$79.38	$118,759.98	$165,526.23
Lodging Total	**$247,001.00**	**$56,200.32**	**$229,484.64**	**$343,854.42**	**$426.30**	**$629,965.68**	**$876,966.68**
Transportation	$512,784.50	$116,658.24	$476,354.48	$716,766.96	$887.88	$1,310,667.56	$1,823,452.06
Retail Purchases	$374,295.00	$85,152.00	$347,704.00	$523,046.16	$649.74	$956,551.90	$1,330,846.90
Attractions & Entertainment	$86,030.50	$19,584.96	$79,971.92	$117,846.82	$147.00	$217,550.70	$303,581.20
Other	$149,730.00	$34,060.80	$139,081.60	$209,864.20	$258.72	$383,265.32	$532,995.32
Total	**$2,137,173.50**	**$486,217.92**	**$1,985,389.84**	**$2,984,914.66**	**$3,701.46**	**$5,460,223.88**	**$7,597,397.38**

Table 10. Estimated Trail Related Expenditures for Alternative 3.

	Current Use Alternative 1	New Foot Traffic only Trails	New Multiple Use Trails				
Expense Categories		Foot Users n=37,254	Foot Users n=97,570	Bikers n=97,570	Horse n=0	New Trails Subtotal	Total Expenditures
Food							
Restaurants	$480,952.25	$95,742.78	$250,754.90	$405,891.20	0	$752,388.88	$1,233,341.13
Other F&B	$286,380.25	$56,998.62	$149,282.10	$242,949.30	0	$449,230.02	$735,610.27
Food Total	$767,332.50	$152,741.40	$400,037.00	$648,840.50	0	$1,201,618.90	$1,968,951.40
Lodging							
Hotel/Motel	$200,234.75	$39,861.78	$104,399.90	$168,796.10	0	$313,057.78	$513,292.53
Camping	$46,766.25	$9,313.50	$24,392.50	$39,028.00	0	$72,734.00	$119,500.25
Lodging Total	$247,001.00	$49,175.28	$128,792.40	$207,824.10	0	$385,791.78	$632,792.78
Transportation	$512,784.50	$102,075.96	$267,341.80	$433,210.80	0	$802,628.56	$1,315,413.06
Retail Purchases	$374,295.00	$74,508.00	$195,140.00	$316,126.80	0	$585,774.80	$960,069.80
Attractions & Entertainment	$86,030.50	$17,136.84	$44,882.20	$71,226.10	0	$133,245.14	$219,275.64
Other	$149,730.00	$29,803.20	$78,056.00	$126,841.00	0	$234,700.20	$384,430.20
Total	$2,137,173.50	$425,440.68	$1,114,249.40	$1,804,069.30	0	$3,343,759.38	$5,480,932.88

Finally, the three alternatives can be compared to determine which has the greatest economic impact on the region. This comparison (Table 11) shows that alternative two should provide the greatest amount of economic impact to the DWGNRA region. The estimated expenditures for alternative 2 of $7,597,397.38 are more than triple the $2,137,173.50 of expenditures for the existing situation, and more than two million dollars over the $5,480,932.88 of estimated expenditures for alternative three.

Table 11. Comparison of Estimated Expenditures Between Alternatives

	Alternative 1 Current Use	Alternative 2	Alternative 3
Expense Categories		*Total Expenditures*	
Food			
Restaurants	$480,952.25	$1,709,569.67	$1,233,341.13
Other F&B	$286,380.25	$1,019,985.55	$735,610.27
Food Total	**$767,332.50**	**$2,729,555.22**	**$1,968,951.40**
Lodging			
Hotel/Motel	$200,234.75	$711,440.45	$513,292.53
Camping	$46,766.25	$165,526.23	$119,500.25
Lodging Total	**$247,001.00**	**$876,966.68**	**$632,792.78**
Transportation	$512,784.50	$1,823,452.06	$1,315,413.06
Retail Purchases	$374,295.00	$1,330,846.90	$960,069.80
Attractions & Entertainment	$86,030.50	$303,581.20	$219,275.64
Other	$149,730.00	$532,995.32	$384,430.20
Total	**$2,137,173.50**	**$7,597,397.38**	**$5,480,932.88**

Conclusions and Implications

The case study using the DWGNRA as an example shows that the economic impact created by recreational facilities or services can be estimated without the process of collecting on-site data. It is also possible to carry this analysis further by inputting the expenditure data into an economic impact modeling package such as IMPLAN, which would calculate indirect economic effects from visitor expenditiures. Furthermore, as time and financial resources continue to become restricted, this methodology may gain popularity as an alternative to more costly procedures. However, due to the fact that in this methodology the economic impact figures are based on averages from a group of sites extrapolated to a new site, no site-specific variables that may influence visitor spending can be accounted for. This restriction suggests several areas of caution for researchers and managers considering this method of determining economic impact including:

- Researchers and managers should make sure that all parties involved in a study using this methodology are aware of the limitations that it imposes, and agree to its use.
- Findings from this methodology need to be strongly qualified to insure that all parties are aware that the findings are estimates derived from outside sources which are similar to the study area.
- Managers and researchers must be careful to consider the source of the data to minimize the chances of inappropriate comparisons between outside sources and the study site.

These limitations suggest that this methodology may be best suited for purposes of justifying alternatives, or a favored plan rather than for decision making purposes.

References

Gobster, P. (1990). The Illinois statewide trail user study. USDA Forest Service, North Central Forest Experment Station: Chicago. Avaliable from Rails-To-Trails Consevancy, Illinois Chapter. Springfield, IL.

Gray, J., Schwecke, T., Sprehn, D., & Hamilton, S. (1989) A look at visitors on Wisconsin's Elroy-Sparta Bike Trail. University of Wisconsin Cooperative Extension Service. Madison, WI.

Lawton, K. (1986). The economic impact of bike trails: A case study of the Sugar River Trail. Unpublished manuscript. Sugar Hill State Trail Corp. New Glarus, WI.

Minnesota Department of Natural Resources (1988). Munger State Trail survey results summary (Hinkley to Moose Lake segment). St. Paul, MN: Minnesota Department of Natural Resouces, Trails and Waterways Unit. Unpublished Paper.

Minnesota Department of Natural Resources (1990a). Douglas State Trail survey results. St. Paul, MN: Minnesota Department of Natural Resouces, Trails and Waterways Unit. Unpublished Paper.

Minnesota Department of Natural Resources (1990b). Heartland State Trail survey results. St. Paul, MN: Minnesota Department of Natural Resouces, Trails and Waterways Unit. Unpublished Paper.

Minnesota Department of Natural Resources (1990c). Munger State Trail survey results summary (Carlton to West Duluth segment). St. Paul, MN: Minnesota Department of Natural Resouces, Trails and Waterways Unit. Unpublished Paper.

Minnesota Department of Natural Resources (1991a). Luce Line State Trail 1990 summer survey results summary. St. Paul, MN: Minnesota Department of Natural Resouces, Trails and Waterways Unit. Unpublished Paper.

Minnesota Department of Natural Resources (1991b). Root River State Trail 1990 summer survey results summary. St. Paul, MN: Minnesota Department of Natural Resouces, Trails and Waterways Unit. Unpublished Paper.

Minnesota Department of Natural Resources (1991c). Sakatah Singing Hills State Trail 1990 summer survey results summary. St. Paul, MN: Minnesota Department of Natural Resouces, Trails and Waterways Unit. Unpublished Paper.

Moore, R.L., Graefe, A.R., Gitelson, R.J., & Porter, E. (1992) The impacts of rail trails: A study of the users and property owners from three trails. National Park Service, Washington DC. 322-594/60324.

Mowen, A.J. (1994) Differences between rail-trail and general trail users of the Mt. Rogers National Recreation Area. Unpublished Masters Thesis, Virginia Tech University, Blacksburg, VA.

Strauss, C.H., and Moran, T.W. (1992) Economic impact of boating and hunting in a five county region surrounding the Delaware Water Gap National Recreation Area. (Unpublished paper).

Contemporary Issues in Recreation and the Environment

INFORMATION SEARCH BY BACKPACKERS: A QUALITATIVE ANALYSIS OF PLANNING BEHAVIORS

Roy H. Ramthun

Assistant Professor, Tourism Industry Management
Concord College, Athens, WV 24712

Abstract: Previous research has indicated that individuals planning trips in outdoor areas use a variety of sources to collect information necessary for the trip. In a previous study, this author found that individuals who backpacked tended to fall into social roles based on relative experience level within the travel group. These social roles were linked to the types and sources of information that individuals preferred. This study was designed to replicate that study for verification purposes. The findings from this study supported the effect of social role in the process of trip information collection.

Introduction

A variety of external sources of information may be used by outdoor enthusiasts as they make plans for travel in wildland areas. These external sources may range from highly reliable to highly unreliable, but most individuals planning outdoor travel do not make objective analyses of source reliability. Evidence suggests that individuals planning wildland travel typically travel in groups of two or more and do not share equally in the information search process (Ramthun, 1998). While there has been a great deal of research in the tourism field on information search (Manfredo, 1989; Perdue, 1993; Schul & Crompton, 1983), the information search process among backcountry travelers has received less attention.

In a previous study on information search by backcountry recreationists (Ramthun, 1998), qualitative interviews indicated that many backpackers relied heavily on more experienced members of their party for trip information. Individuals who traveled with more experienced others tended to rely on those more experienced others as their primary information source. Individuals who traveled with less experienced others had a greater tendency to seek out more formal sources of information, such as guidebooks and literature from management agencies.

Method

A qualitative structured interview process was developed and administered to 55 backpackers from southwestern Virginia during March and April of 1998. Lofland and Lofland (1984) suggest that qualitative methods may the most appropriate methodology for examining practices that respondents do not recognize as important. In this situation, the use of open questions allowed the respondents to provide their own lists of preferred information sources as well as to generate their own rationale for why those sources were preferred. A hypothetical scenario about an upcoming backpacking trip was read to the respondents in a series of episodes. Between each episode, the respondents were asked a series of open-ended questions about the type of information they would prefer to be collecting at this stage of the planning process, what their preferred sources of information would be and why they would prefer those sources. Responses were taped and later transcribed. Respondents were also asked to fill out a data sheet regarding their backpacking experience level. The data sheet also asked respondents if they typically backpacked with people who were more or less experienced than themselves, a critical factor in earlier research on this topic (Ramthun, 1998). Data analysis was done through the development of a series of typologies (Lofland & Lofland, 19840.

Protocol

The first episode of the hypothetical trip was a *trip proposal stage*, in which the storyline states that the respondent's friends suggest a trip to a location the respondent had not heard of before. The second stage of the storyline occurs three weeks before the departure and was referred to as the *early planning stage*. The third episode describes a *late planning stage* two days before departure and the final episode postulates that the trip has begun and that there are opportunities for information gathering in an *on-site stage*.

Respondents

A theoretical sampling procedure was used for this study. Respondents with varying levels of experience in backpacking (but with a minimum of two previous backpacking experiences) were sought out. In this case, 55 subjects were selected from a university population. There were 30 males and 25 females. The respondents had a range of backpacking experience from less than one year to over 12 years. Additional criteria for subjects were that they must not be currently or previously enrolled in any type of outdoor recreation course. Subjects remained blind to the purpose of the study throughout the interview process.

Results

Of the sampled respondents, 21 reported that they typically travel with people who were less experienced than themselves; 34 respondents reported that they typically travel with people who were more experienced than themselves. There were few differences between these types of respondents in the initial (trip proposal) stage of the hypothetical scenario. After having friends propose a trip, 60% of all respondents would trust their friends and agree to go while 40% said they would try to find more information before making a decision. With the exception of the trip proposal stage, there were significant differences between respondents who traveled with more experienced people and respondents who traveled with less experienced people.

During the second phase of the hypothetical scenario (the early planning stage), distinct differences in information collection appeared. Among individuals traveling with less experienced others, 71% would seek information about the site during early planning as opposed to 26% of the people traveling with more experienced others. Among those respondents who travel with more experienced others, 65% preferred information that was individually relevant (clothing requirements, fitness requirements etc). In the third phase (late planning stage) 76% of respondents traveling with less experienced others preferred technical information about the site and its management while only 41% of those traveling with more experienced others would seek that type of information. Individuals traveling with more experienced others continued to prefer information that was individually relevant at this stage. In the final (on-site) phase of the scenario, the differences between the two categories began to narrow. People traveling with more experienced others began to seek specific information about the site at a rate comparable to those who travel with less experienced people.

Preference for information sources was also different between "leaders" and "followers". Those who travel with less experienced others showed a strong preference for more formal information sources such as maps, guide books and material provided by management agencies. Individuals who traveled with more experienced others stated that they preferred "friends" as an information source and would use formal sources less frequently. Internet sites were cited as a preferred source by approximately equal numbers of leaders and followers.

When asked about the rationale for preferring these information sources, general trends in the comments by those traveling with less experienced others indicated that they preferred factual information from authoritative sources. There was also a trend across several respondents of preference for sources that "I could hold on to": which I presume to mean could be taken along on a trip as reference material. Trends in the comments by those traveling with more experienced others suggest a preference for information that is interactive, individually specific and easy to locate. These respondents prefer people as an information source because people could be probed for further information and because people were assumed to be capable of assessing the information seeker and his or her equipment and providing information that was tailored to their particular case.

In summary, those who travel with less experienced people (ie: play a leadership role) describe a greater preference for formal information sources at all stages after the trip proposal. These people in "leader" roles were more likely to want objective information about the site (common weather conditions, trail conditions, special attractions of the area). Those playing a leadership role also indicate a preference for collecting information about the site earlier in the planning process. Leaders were more likely to seek out information about site regulations earlier in the planning process. Respondents who traveled with more experienced people (ie: play a follower role) preferred to collect information from personal or interactive sources at all stages of the hypothetical planning process. These individuals preferred to get information from more experienced people (the most commonly occurring answer), visitor centers and the Internet. These individuals sought information that was more immediately relevant to them (clothing and equipment selection) during the early and late planning stages.

Implications

The results from this study supported the earlier research by again indicating that many differences in information collection behavior are associated with an individuals social role and relative experience within the traveling group. There is no assumption here that there is a causal relationship between these behaviors. It seems likely that people who are good at getting information (and therefore seem well informed) or who are so enthusiastic about the endeavor that they collect a lot of information are the same sort of individuals who will be selected as traveling companions by less experienced backcountry travelers.

The respondents in this study described a wide variety of information sources that they might prefer. Guidebooks, maps and literature from the managing agency were favored by people in leadership roles. People in follower roles indicating a preference for friends, other people who had been to the site, and the Internet as information sources. Land management agencies seeking to provide information for visitors must do so in a wide variety of formats for maximum effectiveness. Maintaining websites and having personnel available for information services will provide the best service to a large percentage of the relatively less experienced wildland visitors. Additionally, managers must be aware that site information is often transmitted to visitors through other visitors. Messages to visitors should be constructed in ways that are robust to transmission through one or more intermediaries. Many brochures and signboards, for example, rely heavily on graphic information, which is not likely to be effective if information is relayed between group members.

References

Lofland, J. & lofland, L.H. (1984). Analyzing social settings: A guide to qualitative observation and analysis. Belmont, CA: Wadsworth.

Manfredo, M. J. (1989). An investigation of the basis for external information search in recreation and tourism. Leisure Sciences (11) 1 29-45.

Perdue, R. R. (1993). External information search in maritime recreational fishing. Leisure Sciences (15) 169-187.

Ramthun, R. 1998. Information use in the trip planning process: A qualitative analysis of backpackers. In: Proceedings 1998 Northeast Recreation Research Symposium. GTR-NE-255. p97.

Schul, P. & Crompton, J. L. (1983). Search behavior of international vacationers: Travel specific lifestyle and sociodemographic variables. Journal of Travel Research , 21 (Fall), 25-30.

USING GEOGRAPHIC INFORMATION SYSTEMS WITH TRAVEL COST MODELS: A CASE STUDY.

William Zawacki

Ph.D. Candidate in Forest Resources. Clemson University, Lehotsky Hall, Clemson, SC 29634-1003.

Allan Marsinko

Associate Professor, Department of Forest Resources, Clemson University, Clemson, SC 29634-1003

Abstract: This study demonstrates the use of the travel cost method combined with geographic information systems (GIS) to estimate the economic value of trips to designated recreation areas in South Carolina. Traditional travel cost methodology relies on the memory of survey respondents or crude simplifications to measure the travel time and distance for recreationists. Using GIS enables more accurate measures of time and distance. In addition, it allows for added visual information and spatial analysis that may be useful in marketing outdoor recreation areas.

Introduction

The Travel Cost Method (TCM) is a commonly applied nonmarket valuation method. The goal of travel cost studies is to estimate an economic value of outdoor recreation that can be used in resource allocation decision-making. Outdoor recreation is a nonmarket good because it is not traded in the market system and therefore does not have a price associated with it. The idea behind travel cost models is to use travel costs as a proxy for the price of a recreation trip to estimate a demand function for trips, and then to use this demand function to estimate economic value.

Using Geographic Information Systems (GIS) with TCM results in more accurate variable estimation, and the elimination of some simplifying assumptions commonly employed in travel cost studies. This study uses six outdoor recreation areas in South Carolina as a case study for the integration of GIS with TCM. First, a discussion of why we would want to use GIS with travel cost models is presented. Then, the methodology for this integration and its effect on economic value estimates is presented. Finally, the use of GIS for the spatial description and analysis of outdoor recreation behavior is presented.

Measurement Issues in TCM

The out-of-pocket price of a recreation trip in a travel cost study is generally defined in either of two ways. These are as a standard vehicle operating cost per mile, or as respondent reported travel expenditures. Following the first procedure requires an estimate of distance traveled. To obtain this, many studies have relied on the memory of survey respondents, which brings up the possibility of recall bias. Even without this bias, there is the issue of how many respondents can very accurately assess how far they have traveled to a recreation site. Studies that have not relied on respondent memory have used straight line distances, which represents a loss of precision in measurement because of the variability in road networks, or have used manually traced distances on a map.

It is generally recognized that the opportunity cost of time should be included as part of the definition of total travel cost. To obtain an estimate of the cost of time, many studies have used an estimate of mileage and assumed a constant rate of speed to get travel time. They use this travel time and some fraction of the wage rate to estimate the cost of time. So, even studies that have used respondent reported travel expenditures require an estimate of mileage and an assumed constant travel speed to get opportunity cost of time.

Using GIS with a travel cost study eliminates the need to rely on respondent memory to get an estimate of mileage. It enables the researcher to easily and accurately measure mileage with less chance of human error than is associated with manually tracing distance on a map. It also enables the calculation of travel time using any factor associated with roads that may affect speed of travel and that may change along a route (e.g. speed limits, congestion factors, and road quality). Also, it enables the simultaneous calculation of travel distance and time for nonparticipants or for visits to potential substitute sites. This increased accuracy in measurement of the price of recreation could be very important because the economic value estimate provided by travel cost models is a function of the coefficient on the travel cost variable. Thus, anything that affects this variable could seriously impact the economic value results. Finally, when the information from a travel cost survey is present in a GIS, it opens up the possibility for spatial analysis of recreation behavior. The potential for using GIS in this area is very good (see Wing and Shelby 1999).

Methods

An on-site survey was done at six upstate South Carolina parks. These were the Fish Hatchery, Oconee State Park, Stumphouse Tunnel Park, Yellow Branch, South Cove County Park, and High Falls County Park. All six are located in the upper Northwest corner of South Carolina as can be seen in Figure 1. The survey was done at day use picnic areas to maintain consistency across the parks. Information was collected about annual number of visits, demographics, and respondent's home zip codes, and this information was entered into the GIS along with the locations of the parks and data on the road network for Georgia, South Carolina, and North Carolina.

Using the network data model in ARC/Info, the shortest path distance in miles and time was calculated from each park to each zip code in Georgia, South Carolina, or North Carolina from which a visit originated. Time was calculated using the distance measure and information about speed limits along the route.

The travel cost analysis was performed using the mileage and

time estimates calculated in the GIS. We specified a very simple version of a travel cost model with number of trips dependent on travel cost and income. Travel cost was calculated assuming a standard vehicle operating cost of 10 cents per mile plus the opportunity cost of time calculated at one third of the wage rate. The wage rate was derived from household income.

To test the effect that using GIS has on economic value estimates, the model was run using five different travel cost definitions. The simple specification of the travel cost model that was used (i.e., trips as a function of travel cost and income) ignores substitute sites and other factors that may influence recreation decisions, but maintains consistency across the models associated with the different travel cost definitions. The first definition was previously described; it used the GIS estimates of mileage and time and assumed 10 cents per mile and a third of the wage rate. The second definition of the travel cost variable used the respondent's estimate of mileage and assumed 10 cents per mile vehicle operating cost, and estimated time from a travel speed of 45 miles per hour. Then, the opportunity cost of time was estimated at a third of the wage rate. This is a common approach in the travel cost literature. The third definition used the respondent's estimate of the total cost of a trip. In this definition, the respondents could include as part of the travel cost anything that they considered relevant. The specific question on the survey that this information was taken from was, "How much would you estimate it cost to come here?"

Using GIS to increase accuracy of mileage and time measurement brings up the question of whether that is really desirable to do so. This is because it may be visitor perceptions of distance and time that affect recreation behavior (McConnell and Strand 1981). In addition, there are different types of recreationists. There are those who decide where they want to go before they leave home; they go there and then come back. These are referred to in this study as straight-line-travelers. These are the 'pure visitors' defined in Cheshire and Stabler (1976). Another potential decision-making process involves heading in a general direction to look around and see what looks good and stop there. These are referred to as meanderers. The idea is that for straight-line-travelers, increased accuracy in measurement through shortest path estimation of mileage and time using GIS may be appropriate, but for meanderers, who may not have even taken the shortest path, the respondent's own assessment of distance and time may be more appropriate. Therefore, the final two definitions of the travel cost variable distinguish straight-line-travelers and meanderers in the survey and assign the straight-line-travelers the GIS based cost and assign the meanderers their perceptions of cost. The fourth travel cost definition uses the GIS estimates of mileage and time and assumes 10 cents per mile vehicle operating cost and a third of the wage rate for straight-line-travelers. For meanderers this definition uses respondents' assessment of mileage with 10 cents per mile and assumes 45 miles per hour travel speed to get time, and then assumes one third of the wage rate to get the cost of time. The final travel cost definition uses the GIS based mileage and time in the same fashion as previous definitions for the straight-line-travelers, and uses respondents' assessment of the total cost of the trip for the meanderers. The straight-line-travelers and meanderers were distinguished by a question in the survey which solicited information about the way the respondents decided where to go for their recreation trip. Did they decide where to go before they left home or while in transit.

Results

The modeling results are presented in Table 1, which shows the results of the model with the GIS based travel cost. There are five separate models, one for each of the travel cost definitions. Only the GIS based model is presented here, but the coefficients on the travel cost variable and income was significant in all five models and the signs of these were both significant in all five models. The negative coefficient on the travel cost variable supports an inverse relationship between travel cost and number of trips. The negative coefficient on the income variable may be because of the nature of an afternoon outing to a park being more of a time intensive than money intensive good. It is possible that higher income groups have less leisure time to engage in this kind of activity.

Table 1. Truncated Poisson Recreation Demand Model

Variable	Coefficient	Asymptotic t-ratio	Mean
Constant	1.95	36.926	-
GIS cost	-0.0257	-12.413	25.64
Income	-0.0049	-4.001	45.97

The economic value results for each of the five models are presented in Table 2. The first thing to notice is that using GIS did affect the results. The results from the model where travel cost was defined as respondent's assessment of mileage was much higher than the results from the GIS based cost. The respondent's assessment of mileage result was $50.95 while the results from the GIS based cost was $38.97. The standard deviation of the value estimate from the respondent's assessment of mileage was approximately twice that of the standard deviation from the GIS based cost (6.20 and 3.14 respectively). The value estimate from the respondent's assessment of total cost was quite close to the GIS based value estimate, but its standard deviation is even larger than the mileage perception estimate. Using the respondent's assessment of total cost gave a standard deviation of 7.30. Considering the final two travel cost definitions, the a priori hypothesis was that separating the meanderers and straight-line-travelers and assigning them a cost more associated with their decision-making processes would increase precision in the value estimates (i.e., provide the smallest standard deviations). However, the most precise estimates resulted from using the GIS based costs for all respondents, including the meanderers.

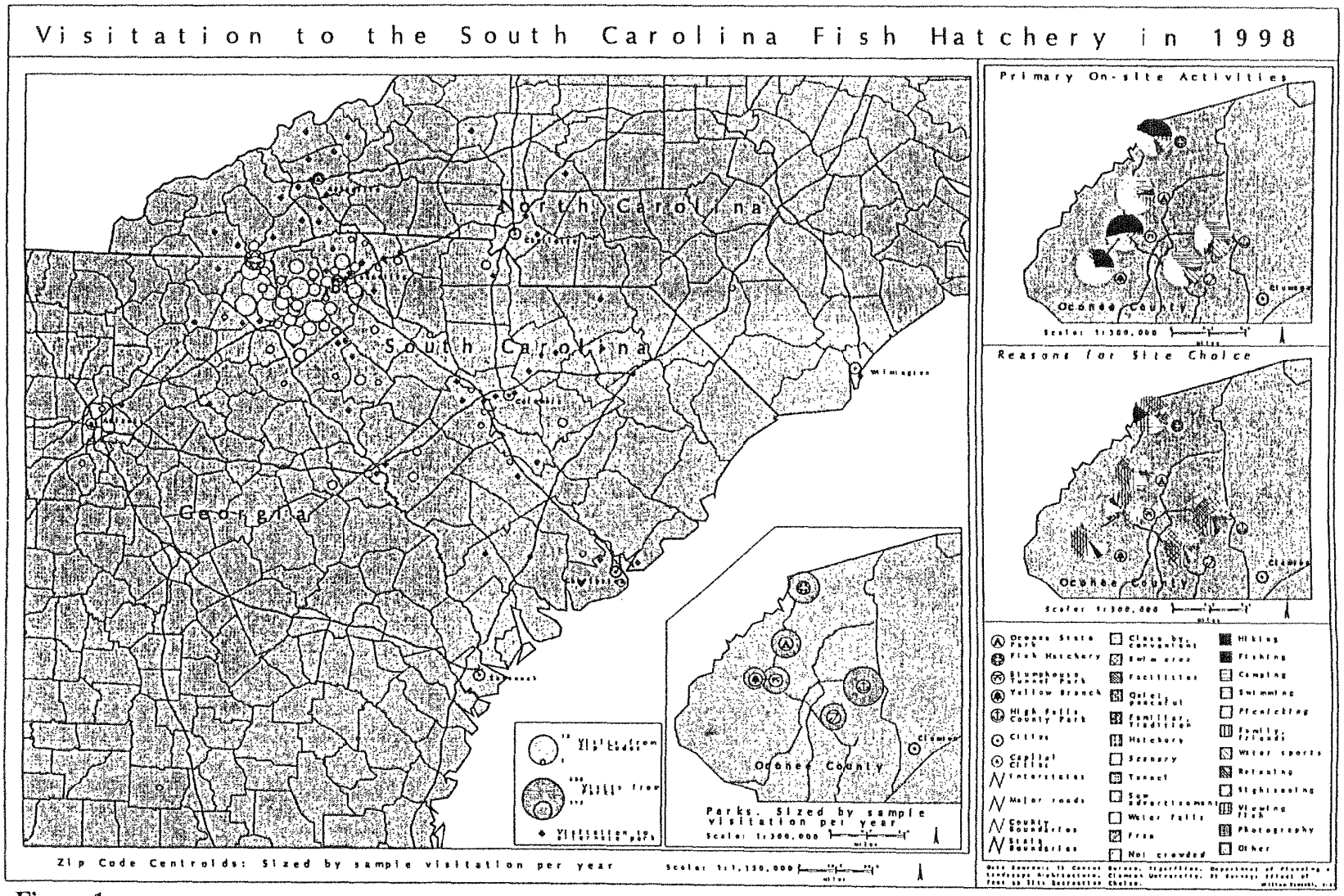

Visitation to the South Carolina Fish Hatchery in 1998
North Carolina
South Carolina
Georgia
Wilmington
Oconee County
Parks. Sized by sample visitation per year
Scale: 1:300,000
Zip Code Centroids: Sized by sample visitation per year
Scale: 1:1,150,000
Primary On-site Activities
Reasons for Site Choice
Oconee State Park
Fish Hatchery
Blumphouse Tunnel Park
Yellow Branch
High Falls County Park
Cities
Capital Cities
Interstates
Major roads
County Boundaries
State Boundaries
Close by, convenient
Swim area
Facilities
Quiet, peaceful
Familiar, tradition
Hatchery
Scenery
Tunnel
Saw advertisement
Water falls
Free
Not crowded
Hiking
Fishing
Camping
Swimming
Picnicking
Family, friends
Water sports
Relaxing
Sightseeing
Viewing fish
Photography
Other

Figure 1

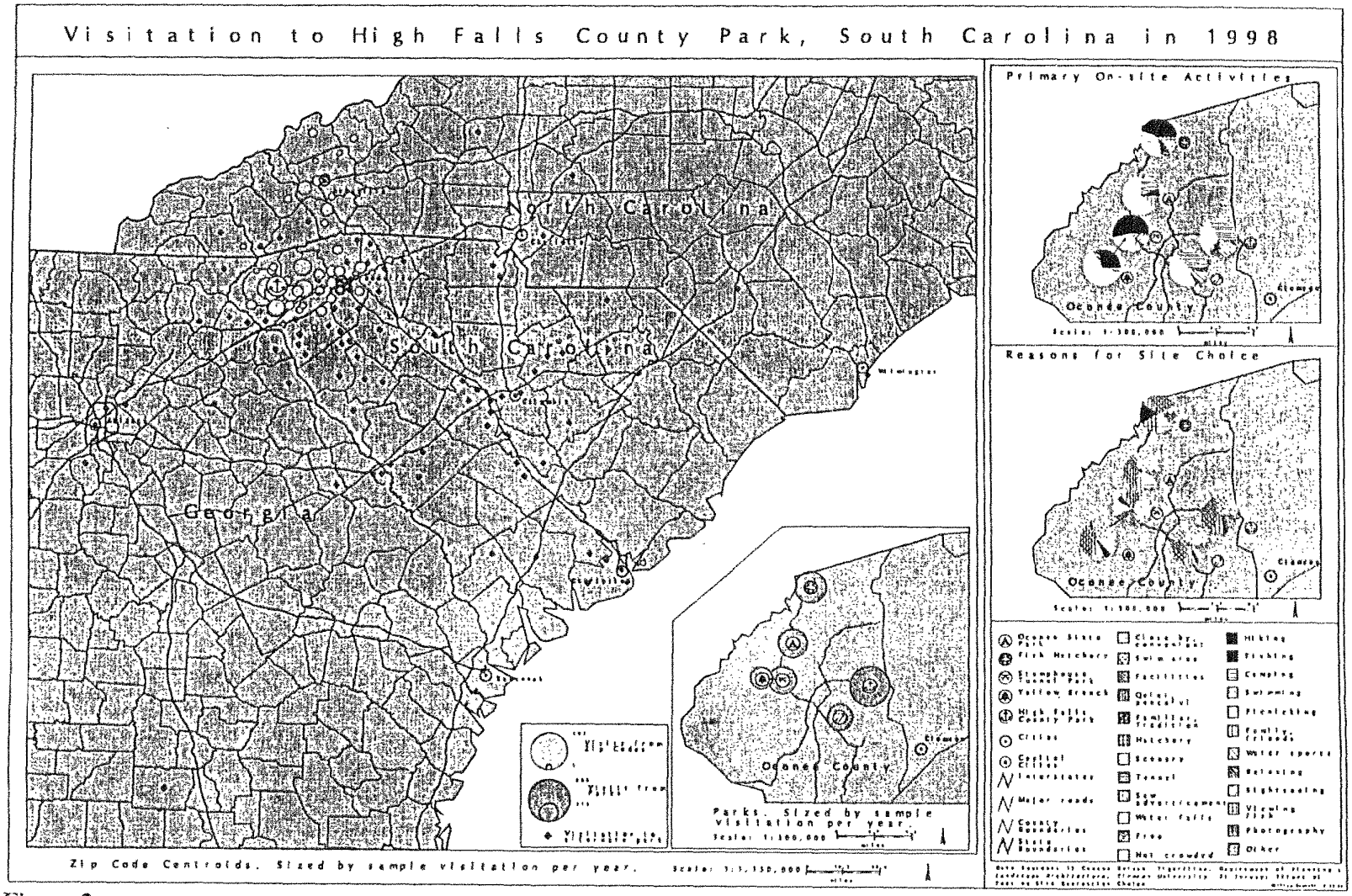

Visitation to High Falls County Park, South Carolina in 1998
North Carolina
South Carolina
Georgia
Zip Code Centroids. Sized by sample visitation per year.
Parks. Sized by sample visitation per year.
Oconee County
Primary On-site Activities
Reasons for Site Choice
Hiking
Fishing
Camping
Swimming
Picnicking
Water sports
Relaxing
Sightseeing
Photography
Other

Figure 2

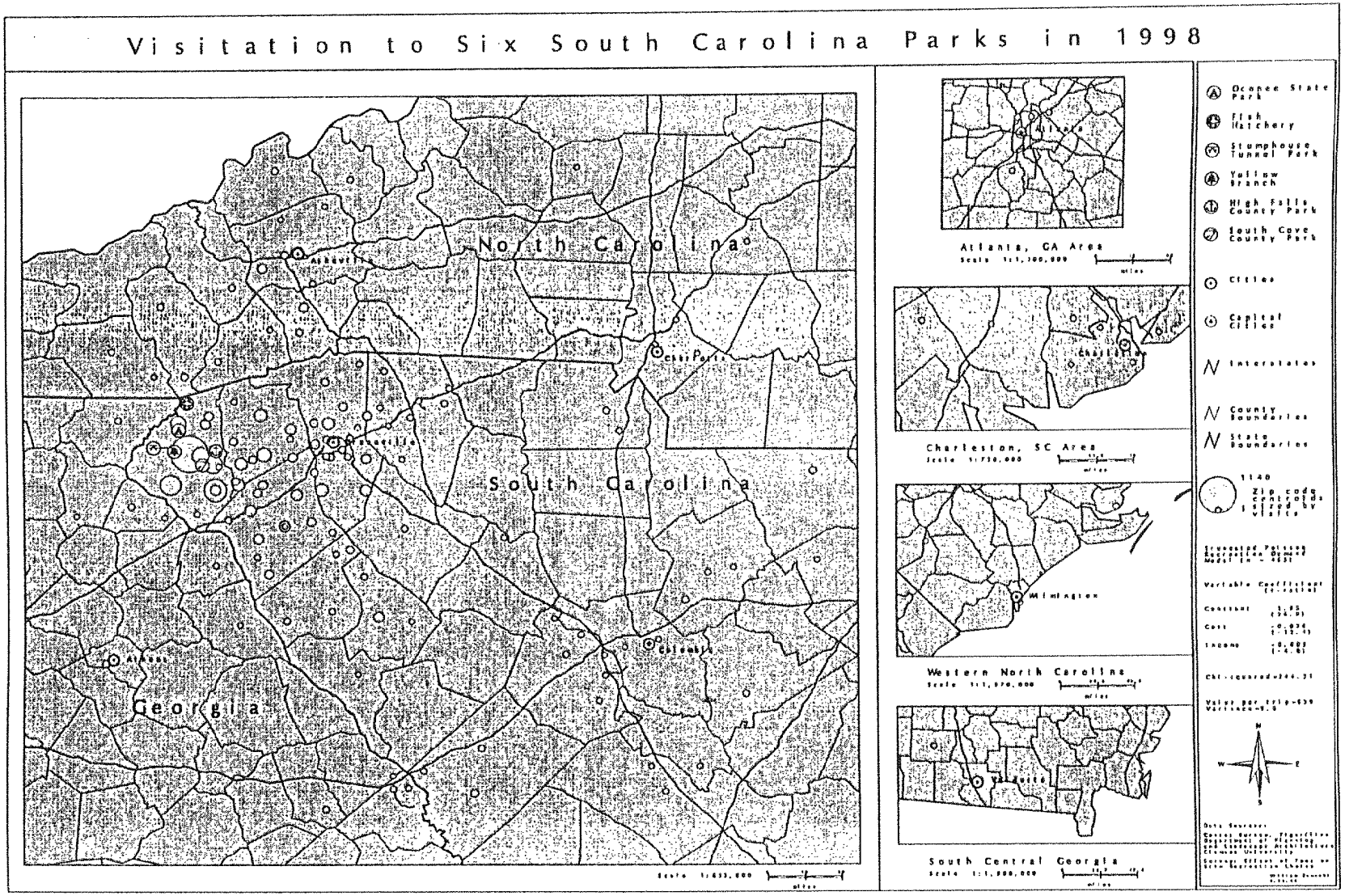

Visitation to Six South Carolina Parks in 1998
North Carolina
South Carolina
Georgia
Atlanta, GA Area
Charleston, SC Area
Western North Carolina
South Central Georgia
Oconee State Park
Fish Hatchery
Stumphouse Tunnel Park
Yellow Branch
High Falls County Park
South Cove County Park
Cities
Capital Cities
Interstates
County Boundaries
State Boundaries
Zip codes

Figure 3

Table 2. Economic Value per Trip (Dollars).

Travel Cost Specification	Point Estimate	Standard Deviation
GIS cost	38.97	3.14
Mileage perception	50.95	6.20
Total cost perception	39.97	7.30
Mileage mixture	47.15	5.01
Total cost mixture	38.05	5.25

The implications of these results are that GIS increased the precision of the value estimates. All else equal, it is important to have precision in economic value estimates. Wide confidence intervals will lessen the power of the results in terms of using them for policy or management decisions. Also, the point estimates differed across the five travel cost definitions. This has implications for studies that have relied on respondent recall and perceptions of mileage and cost. These results are not necessarily generalizable, but they illustrate the importance of considering accuracy of measurement in applications of travel cost models.

Spatial Analysis

A further advantage of using GIS is the potential to use the recreation data to spatially describe and analyze behavior. Figure 1 is a picture of the spatial distribution of visitation to the six parks. The circles are zip code centroids sized by total number of sample visits to any of the six parks as well as two roadside picnic areas per year.

The next two figures (2 and 3) show the spatial distribution of visitation to two of the six parks separately. Again, the circles are zip code centroids sized by sample visitation per year. The diamonds represent a zip code that had a visit occurrence to one of the other parks. The insert shows the parks themselves sized by relative visitation. The pie charts on the right side of the maps show the relative frequencies of primary activities on-site and reasons for site choice. Thus, these maps present a picture of where people are coming from, where they're not coming from in terms of other parks in the area, where they're going to, why they go where they go, and what they do once they get there. The main purposes of these maps in this study is to provide information to the individual park managers, but also to illustrate the potential of using GIS in a human dimension area of recreation management. These are useful to managers for marketing purposes (knowledge of where your customer base is and is not coming from) and in understanding the nature of their visitors in terms of the services and amenities that visitors prefer. Some of this information could be offered in tables, but it may be more interesting to look at in a map format than in frequency tables.

Conclusion

This paper points out measurement issues in travel cost studies, which can impact the accuracy and precision of value results. It also presents a GIS case study for handling these measurement issues. In this study, using GIS with the travel cost model results in more precise value estimates. Maps produced in this study provide information that may be useful for management and marketing of the recreation sites.

References

Cheshire, P.C. and M.J. Stabler. 1976. Joint Consumption Benefits in Recreational Site 'Surplus': An Empirical Estimate. Regional Studies. 10:343-351.

McConnell, K.E. and I.E. Strand. 1981. Measuring the Cost of Time in Recreation Demand Analysis: An Application to Sport Fishing. American Journal of Agricultural Economics. 63:153-156.

Wing, M. and B. Shelby. 1999. Using GIS to Integrate Information on Forest Recreation. Journal of Forestry. 97(1):12-16.

Acknowledgements

Research on which this publication is based was funded, in part, through a research joint venture agreement with the USDA Forest Service, North Central Research Station, Evanston, Illinois.