

Table of Contents

Ethnicity in Parks and Recreation - Keynote Session

- The Implications of Increased Racial and Ethnic Diversity for Recreation Resource Management and Planning 3
John F. Dwyer and Paul H. Gobster
- How Parks Canada has Responded to the Challenge of Racial and Ethnic Diversity 8
Dick Stanley

Rural and Sustainable Tourism

- A Conceptual Model for Facilitating Rural Tourism Development 15
Steven W. Burr
- The Development of Ecotourism and the Necessity for the Issue of Environmental Auditing in its Planning
Agenda 19
Dimitrios Diamantis
- Seasonal Homes in Berkshire County, Massachusetts: An Exploratory Study 24
Rodney B. Warnick
- Sustainable Tourism Development in the Adirondacks: Using the Internet to Empower Local Communities 31
James F. Casey, Gene L. Brothers, and Stephen Bond

Recreation and Tourism In the Nineties

- Using Ecosystem-Based Management to Develop Community 37
Bill Elmendorf
- Managing Parks for People: An Activity Package Approach 41
Robert S. Bristow, Stanley R. Leiber, and Daniel R. Fesenmaier

Ethnicity in Recreation

- The Influence of Recreationists' Cultural or Ethnic Background Upon Their River Recreation Experiences 49
Katharine A. Pawelko, Ellen B. Drogin, and Alan R. Graefe
- The Role of Multiculturalism in Tourism/Recreation Marketing and Planning Efforts 55
Edwin Gomez
- Ethnicity and its Impacts on Recreation Use and Management: Roundtable Discussion Notes and Bibliography 60
Katharine A. Pawelko, Varna M. Ramaswamy, Benjamin Wang, Jennifer A. Treadwell, and Edwin Gomez

Contemporary Outdoor Recreation Issues

- National Parks: Can the Old Dog Learn New Tricks? 69
James F. Palmer
- An Assessment of Customer Satisfaction at a U.S. Army Corps of Engineers Water-Based Recreation Area:
The Case of Lake Sakakawea, North Dakota 72
Robert C. Burns, Alan R. Graefe, and John P. Tiire

Water Based Recreation

- A Comparative Analysis of Value Between Users and Non-Users of the White River 79
Lesley G. Frymier and Christina Mitchell
- Michigan Recreational Boater Compliance With the Clean Vessel Act in Use of Pumpout and Dump Stations:
Relationships Between Attitudes, Knowledge, Socio-Demographic Factors and Behavior 82
Gail A. Vander Stoep
- Oyster River Watershed Study: A Summary Report 93
Elizabeth Hanratty, Robert A. Robertson, Edmund Jansen, and Mary Robertson

Forest Planning

- Collaborative Planning and the USDA Forest Service: Land Manager Perspectives 101
Steven W. Selin, Michael A. Schuett, and Deborah S. Carr

National Forest Planning: Assessing Public Preferences for Recreation Strategies	105
<i>Donald F. Dennis</i>	
Conceptual Relationships Between Impact Parameters of Social Carrying Capacity and ROS	109
<i>Namjo Kim and Alan R. Graefe</i>	

Featured Speech - Jay Beaman

Recreation Research Past, Future, and the Critical Relationships with Management That Influence the Direction and Success of Research: Views from "Outside" After More Than Two Decades in a Federal Agency	117
<i>Jay Beaman</i>	

Outdoor Recreation Motivations and Norms

Angler Segmentation Based on Motivational Scale Scores	127
<i>Chad P. Dawson</i>	
Where Did You Learn That? An Examination of Visitors' Historical Frame of Reference and the Relationship to Attitudes About Authenticity and Satisfaction	131
<i>John J. Confer, Jr., Deborah L. Kerstetter, Clarissa W. Confer, and Kelly S. Bricker</i>	
Specialized Participants and Their Environmental Attitudes: Re-examining the Role of "Traditional" and Psychological Specialization Dimensions	134
<i>Andrew J. Mowen, Daniel R. Williams, and Alan R. Graefe</i>	
Crowding Norms for the Carriage Roads of Acadia National Park: Alternative Measurement Approaches	139
<i>Robert E. Manning, William A. Valliere, and Charles Jacobi</i>	
Relationships Between Motivations and Recreation Activity Preferences Among Delaware State Park Visitors: An Exploratory Analysis	146
<i>John J. Confer, Jr., Hans G. Vogelsong, Alan R. Graefe, and David S. Solan</i>	

Recreation Resource Management

Updating the Recreation Opportunity Spectrum User Guide - Eastern Region Supplement	157
<i>Joel A. Lynch and Charles M. Nelson</i>	
Evaluating LAC on the Chilkoot Trail, Alaska	160
<i>John J. Lindsay</i>	
Perceptions of and Preferences for Security by Michigan State Forest Campground Campers	164
<i>Paul R. Johnson and Charles M. Nelson</i>	
Issues and Concerns Facing Managers and Owners of Public and Private Campgrounds in New Hampshire and Vermont	167
<i>Michael R. Sciabarrasi and Robert R. Robertson</i>	

Recreation Management Administration

Demarketing in Park and Recreation Management	173
<i>Christopher Groff</i>	
Issues in Developing Effective Measures for Decisions of Use/Attendance/Benefit Changes Over Time	178
<i>Jay Beaman and Ed Thomson</i>	
An Analysis of Vehicle Accidents Involving White Tailed Deer: A Geographic Information Systems Case Study	187
<i>Christopher A. Mueller, David L. Wall, and Stuart P. Cottrell</i>	

Festivals and Travel

Motivations for Attending A Family-Centered, Non-Alcoholic Festival: An Exploratory Study of A Regional First Night® Event	195
<i>Pamela H. Mowrer and Deborah L. Kerstetter</i>	
Crowding at an Art Festival: A Replication and Extension of the Outdoor Recreation Crowding Model	198
<i>Hoon Lee, Deborah L. Kerstetter, Alan R. Graefe, and John J. Confer, Jr.</i>	
The Economic Impact of Conferences and Conventions	205
<i>Stephen C. Grado, Charles H. Strauss, and Bruce E. Lord</i>	

Outdoor Recreation Values

Adding Value to the Outdoor Recreation Experience	213
<i>Glen D. Alexander</i>	
Environmental Values, Environmental Ethics, and National Forest Management: An Empirical Study	216
<i>Robert E. Manning, William A. Valliere, and Ben Minter</i>	
Value Differences Between Consumptive and Nonconsumptive Recreationists	223
<i>Rod Zwick and David S. Solan</i>	
Perceived Constraints on Trapping Among Trappers in Six Northeastern States	227
<i>Tammy J. Larkin and Rod Zwick</i>	

Planning for the Nineties

Resource Based Voluntary Organizations in New Hampshire: Preliminary Investigations of Board Members ..	233
<i>Laura Pfister and Robert A. Robertson</i>	
A Social Science Research Planning Process for New Hampshire's Coastal Zone: A Working Paper	238
<i>Robert A. Robertson</i>	
Urban Greenway Planning: Tannery Brook, Holyoke, MA	244
<i>Stephanie B. Kelly and Barbara Moser</i>	

Economic and Tourism Issues

A Modified Method for Measuring the Economic Impact of Tourism	249
<i>Stephen D. Reiling, Matthew J. Kotchen, and Jeffrey Michael</i>	
A Triangulation of Economic Impact Assessments and Implications	252
<i>Philip Wang and Rob Bixler</i>	
Economic Impact of Travel and Tourism in Southwestern Pennsylvania	256
<i>Charles H. Strauss, Bruce E. Lord, and Stephen C. Grado</i>	
The Theoretical Analysis of Travel and Tourism Demand	261
<i>Kuan-Chou Chen</i>	
The New England Travel Market: 1980 to 1994 - An Update	264
<i>Rodney B. Warnick</i>	
Understanding the Market for Parks Canada Branded Souvenirs and Gifts	270
<i>Fernando Mata and Dick Stanley</i>	
Diary of a South Pacific Journey to Tahiti: An Exploratory Assessment of Trip Satisfaction	275
<i>Stuart P. Cottrell and Kelly A. Bricker</i>	
County Level Travel and Tourism Impacts - Contrasting Nine Pennsylvania Counties	279
<i>Bruce E. Lord, Charles H. Strauss, and Stephen C. Grado</i>	

1996 Southeastern Recreation Research Symposium Papers

Interstate Impact of Sportfishing	285
<i>Rebecca J. Travnichek and Howard A. Clonts</i>	
Core-and-Buffer Management for Ecotourism in South Carolina's ACE Basin	293
<i>Robert L. Janiskee and Peter G. Chirico</i>	
National Survey on Recreation and the Environment: Biasing Effects of Including a Participation Screening Question	296
<i>H. Ken Cordell, Burt R. Lewis, Barbara L. McDonald, and Morgan Miles</i>	
A Conceptualization of the Tourism Entrepreneurial Process	301
<i>Khoon Y. Koh</i>	

Index of Authors	309
------------------------	-----

Conference Papers Not Submitted to the 1996 Proceedings

If you are interested in getting additional information about any of the papers that were presented at the 1996 NERR Symposium, but were not submitted for publication, please contact the authors directly. A list of those papers below will assist you in identifying the authors.

Issues of Ethnicity Among State Park Visitors in the New York Metropolitan Area *Kieran Quinn* (Palisades Interstate Park Commission)

Managing Recreation Resources to Enhance Regional Cultures *Francisco Valenzuela* (U.S. Forest Service-Milwaukee)

Barriers to Implementation of Sustainable Tourism Initiatives *Andrew Holdnak* (University of Florida)

The Tourism Life Cycle and Net Migration in a Vermont Community *Varna M. Ramaswamy and Walter I. Kuentzel* (University of Vermont)

Outdoor Recreation Activity Preferences: A Geographical Perspective Based on Population Density *A. Williams and Robert A. Robertson* (University of New Hampshire)

The Problems of Movie Induced Tourism *Roger Riley* (Illinois State University), *C. Van Doren*, and *D. Baker* (Texas A&M University)

Involvement With New Hampshire Snowmobile Association's Trailmaster Program: A Profile of Volunteer Activities and Motivations *Michael Provost and Robert A. Robertson* (University of New Hampshire)

Salmon Falls River Greenbelt Plan: A Study in Coordination Between Non-Profits, Municipalities, and States *P. Schumacher* (Town of South Berwick, ME) and *J. Demetracopolous* (Great Works Regional Land Trust)

Understanding Natural Beauty *Tom More* (USDA Forest Service, Northeastern Forest Experiment Station), *James Avcrill*, and *P. Stanat* (University of Massachusetts)

Locus of Control as a Factor in Hunting and Fishing Participation Among Northeast Kingdom Residents *Rodney Zwick* (Lyndon State College), *Ron Glass* (USDA Forest Service, Northeastern Forest Experiment Station), *David Solan* (Mansfield University), and *David Tucker* (Northeast Kingdom Community Action)

Sustainable Tourism and Cultural Attractions: A Comparative Study in Ethnic Interpretative Centers in China and Canada *Y. Li* (University of Western Ontario)

Ethnicity and Recreation: A Case of Korean Immigrants *W. Jeong and H. Kim* (Pennsylvania State University)

Teaming with Wildlife: A Natural Investment *N. Edelson* (International Association of Fish and Wildlife Agencies)

The Value of River Protection to Businesses in Vermont *Kari Dolan* (National Wildlife Federation, Montpelier, VT)

Risk Taking Behavior and the West Virginia Commercial Whitewater Study *J. Levendorf* (West Virginia University)

Collaborative Planning and the USDA Forest Service: Role of the External Partners *Rick Beauchesne* (West Virginia University)

Integrating Recreation Into Forest Management Prescriptions with NED *Mark Twery* (USDA Forest Service, Northeastern Forest Experiment Station)

Bike Paths: Standardizing Design Standards *Skip Echelberger* (USDA Forest Service, Northeastern Forest Experiment Station) and *Anne Lusk* (The Greenway Connection, Stowe, VT)

Computer Simulation for Recreation Management on the Carriage Roads of Acadia National Park *Ben Wang and Robert Manning* (University of Vermont)

Hands on or Hands Off? Disgust Sensitivity and Preferences for Environmental Education Activities *Rob Bixler* (Cleveland Metroparks) *and Myron Floyd* (Texas A&M University)

Professional Preparations for the Management of Festival Events *J. Zanhar* (City College, Ottawa, Canada) *and J. Kurtzman* (Sports Tourism International Council, Ottawa, Canada)

Historical Perspectives of Festival Events. *J. Zanhar* (City College, Ottawa, Canada) *and J. Kurtzman* (Sports Tourism International Council, Ottawa, Canada)

The Concept of Value in Outdoor Recreation *Tom More* (USDA Forest Service, Northeastern Forest Experiment Station)

Influence of Intrinsic and Extrinsic Factors on Environmental Concern and Behavior. *Victor Caro* (West Virginia University)

Economic Impacts of Snowmobiling in New Hampshire. *Dan Gardoqui and Robert A. Robertson* (University of New Hampshire)

The Influences of Demographic Factors on Incentive Reward Preferences. *Kimberly J. Shinew, Margie Arnold, and D. Tucker* (University of Illinois)

The Coalition for Unified Recreation in the Eastern Sierra (CURES) A Profile of a Cooperative Recreation and Tourism Planning Initiative *Nancy Myers* (U.S. Forest Service) *and Steve Selin* (West Virginia University)

Proceedings of the 1996 Northeastern Recreation Research Symposium

March 31 - April 2, 1996



On Lake George in Bolton Landing, New York

Compiled and Edited by:

Walter F. Kuentzel
School of Natural Resources
University of Vermont

Sponsors:

Lyndon State College
Mansfield University
Michigan State University
New Hampshire Division of Parks & Recreation
Pennsylvania State University
Society of American Foresters, Recreation Working Group
SUNY College of Environmental Science & Forestry
University of Massachusetts
University of New Hampshire
University of Vermont
University of Waterloo
USDA Forest Service, Northeastern Forest Experiment Station
Western Illinois University
Westfield State College
West Virginia University

**Recreation
Resource
Management**

**UPDATING THE RECREATION OPPORTUNITY
SPECTRUM USER GUIDE - EASTERN REGION
SUPPLEMENT**

Joel A. Lynch

PhD Student, Department of Park, Recreation, and Tourism
Resources Michigan State University, 131 Natural Resources
Building, East Lansing, MI 48824-1222

Charles M. Nelson

Assistant Professor, Department of Park, Recreation, and
Tourism Resources Michigan State University, 131 Natural
Resources Building, East Lansing, MI 48824-1222

Abstract: The Recreation Opportunity Spectrum User Guide - Eastern Region Supplement supplies USFS managers with criteria used in the planning and management of recreation in Eastern Region National Forests. This supplement was examined and three problems were identified. These include vague parameters, direct inconsistencies, and facilities lacking standards. Revisions are proposed.

Introduction

The Recreation Opportunity Spectrum (ROS) is a USDA U.S. Forest Service (USFS) planning and management framework that was developed to resolve the dilemma of integrating recreation with other forest resources into multiple-use Land and Resource Management Plans (LRMP). The concept of ROS originated with Driver, Brown and associates (1978), while the planning and management framework eventually adopted by the USFS in 1980 was developed by Clark and Stankey (1979). The underlying premise of this framework is that recreationists realize satisfactory experiences by engaging in preferred activities in desired settings (Driver and Brown 1978). By combining activity and setting characteristics, a spectrum of six recreational opportunity classes is defined, each specifically characterizing a distinct, probable experience. These classes include primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban. Each class is characterized by a combination of physical, biological, social, and managerial criteria.

The ROS User Guide (USDA-FS 1982), which is based upon the characteristics of western forests, was developed to provide USFS managers with criteria defining the range of recreational activities, experiences, and settings for each opportunity class. In Eastern Region National Forests, ROS was employed as one of the tools in the development of each of the LRMP. These forests are often fragmented by a high percentage of private in-holdings, many that have been intensively developed and managed during the early part of this century. In contrast, western forests are predominately under USFS ownership with diverse recreational settings from highly managed and accessible to unmanaged remote areas. Because of this disparity, the ROS User Guide - Eastern Region Supplement (USDA-FS 1985) was developed to

augment the criteria set forth by the ROS User Guide (USDA-FS 1982). The Eastern Supplement is used to assist in land and resource planning and management the delineation of ROS classes, conducting trade-off analysis among multiple-use resources, defining conditions of recreation settings and facilities, guiding non-recreational management activities, and directing the development of management standards. Successful integration and management of recreation in eastern National Forests is influenced by the extent that each class's criteria are used in land and resource planning and management. However, this implies that the criteria are understandable and encompass the range of setting and activities.

In 1993 Michigan State University entered into a cooperative agreement with the USFS to assess their management practices on non-wilderness semi-primitive areas in Michigan's Hiawatha National Forest (Lynch and Nelson 1995). As part of this study, the ROS Use Guide - Eastern Region Supplement for semi-primitive non-motorized (SPNM) and semi-primitive motorized (SPM) classes was closely examined. Semi-primitive areas are defined as natural appearing forested landscapes providing solitude, without highly visible evidence of management activities. They are particularly important in eastern forests as opportunities at the primitive end of the spectrum are rare (Table 1). Betz and Cordell (1989) also predict expansion in dispersed outdoor recreation activities in undeveloped settings for the coming years.

Table 1. Percentage of ROS class allocation in the Eastern Region National Forests.

ROS Class	% Allocation
Primitive	1.7
Semi-Primitive Non-Motorized	19.3
Semi-Primitive Motorized	10.4
Roaded Natural	67.4
Rural	1.1
Urban	0.0

a/ Source: Leefer, L. A., M. McDonough, & D. K. Smith. Allocating our National Forests for recreation opportunities. Unpublished Report. Department of Forestry, Michigan State University, East Lansing, MI.

Analysis and Corrections

The examination of the standards and guidelines, provided in the ROS User Guide - Eastern Region Supplement, revealed three principal problems:

1. Vague, poorly defined standards that are not specific, measurable parameters
2. Direct inconsistencies and contradictions
3. Selected recreation facilities lacking standards and guidelines

The use of faulty criteria in planning and management of recreation has negative consequences. First, deficient criteria lead to ambiguous opportunity settings that may not meet user expectations or severely impair their ability to achieve a positive recreational experience. Moreover, management actions may be contrary to the spirit and letter of the ROS designation, creating conflict between managers and the public.

Specific, Measurable Parameters

The following is a listing of the standards and guidelines where specific, measurable parameters are absent.

1) Limited car/truck access and mobility is one of the defining characteristics of semi-primitive areas. According to the ROS User Guide (USDA-FS 1982), motorized use is intended to be restricted to specific recreation sites in SPNM areas, while in SPM areas road access is somewhat less limited. For roads in SPNM, the Eastern Region Supplement (1985:6) specifies "roads and trails (are) normally closed to public motor vehicle travel" while in SPM areas, (1985:8) "roads and trails may be open or closed to public motor vehicle travel." Both standards and guidelines, while stating a purpose, do not establish the conditions under which a road would be open or closed. Furthermore, in SPNM areas, this standard is not adequate because of the flexibility created by the word "normally." To rectify this we suggest, that motorized access in both SPNM and SPM areas be restricted to only long-term roads. All Traffic Service Level D roads should be eliminated or gated only to be used for management purposes. Exceptions to this should be limited to only those Level D roads that lead to specific recreation sites, for in-holders to reach their property, or where appropriate seasonal activities are dependent on motorized vehicles.

2) The Eastern Region Supplement states (1985:6) "trails are maintained for foot and/or horse use" in SPNM and (1985:8) "for specific motorized use" in SPM. This does not appear to address mountain biking or dog sledding. Further, there is no discussion of the standards for foot or horse trails such as treadway width, shoulder height width, etc. or reference to them in another applicable standards document. We suggest the following revision: In SPNM areas trails are maintained for foot (including hiking, cross country skiing, or snowshoeing), mountain bike, dog sledding, and/or horse use as appropriate. SPM area non-motorized trails are maintained for foot (including hiking, cross country skiing, or snowshoeing), mountain bike, dog sledding and/or horse use as appropriate. SPM area motorized trails are maintained for off-highway vehicle and/or snowmobile use as appropriate. Standards for trail design and maintenance will be those contained in (cite appropriate reference).

3) The Eastern Region Supplement states (1985:6 & 8) "trail maintenance is for the protection of resources and public safety." What are the key concerns about resource protection and public safety? Do resource concerns revolve around erosion and littering, or are there other concerns? For public safety, are the concerns related to law enforcement actions, facilities that could cause injury if not properly maintained, or are there other concerns? There appear to be no objectives for satisfaction, visitor enjoyment, environmental education, or other possible benefits as part of a maintenance program. We suggest the following revision for both SPNM and SPM areas. Trail maintenance should be conducted to protect resources from impairment and provide for visitor safety and enjoyment, noting the above concerns.

4) The Eastern Region Supplement (1985:7 & 9) states "native materials will be used in the construction of facilities." What constitutes native materials? Is dimensional lumber a native material? Is dimensional lumber that is pressure treated to allow

long term ground contact without rotting native material? With the safety of the public a major concern, facilities constructed of durable materials based on natural substances may be highly appropriate. Further, some facilities such as composting toilet buildings and synthetic fabrics for steep, erodible trail slopes, which definitely protect the environment, are clearly not constructed of native materials, yet may be warranted to safeguard the environment. We suggest the following revision: Natural materials should be used where consideration for natural appearance outweighs concerns for maintenance efficiency and environmental protection. Natural materials are defined as those normally found within that forest situation and may include logs, gravel, sand, and similar substances. They also include materials whose base is found in the forest such as dimensional pressure treated lumber. All materials, whether classified as natural or not, will be used in a manner that blends into the landscape.

Direct Inconsistencies

Direct inconsistencies within the ROS User Guide - Eastern Region Supplement occur regarding appropriate levels of campground development and visual quality.

1) One of the defining characteristics of these areas pertains to appropriate Recreation Development Levels and facility capacities. The Recreation Development Level specifically defined for both semi-primitive classes is Level 2 (USDA-FS 1986). However, the standard in Chapter Two of the Eastern Region Supplement states (1985:6 & 8) for SPNM and SPM, "developed camping facilities will contain no more than 10 sites and are Development Level 1." The Guide then asks the reader to see Figure 8 in the document for facilities compatible with these management designations. When the reader goes to Figure 8, it indicates that Development Levels 1 - 3 are appropriate for SPM and Development Levels 1 - 2 are appropriate for SPNM areas. This is a direct contradiction. Additionally, there is confusion in the total facility capacities in these areas. The written Eastern Region Supplement standard limits the total number of sites to ten in both areas, while a subsequent figure in Chapter Three of the Guide specifies a range from ten to twenty-five sites. In keeping with the general goal of these areas, we suggest the following revision: for SPNM areas developed camping facilities will contain no more than ten sites and are Development Level 1 - 2. These sites are typically suitable for tent camping. In those areas of unique environments where site hardening is essential, provisions for limited facility development of Level 2, including pit toilets, manufactured fire rings, and trash receptacles, should be made. This development should be made only for protection of the environment, such as controlling impacts to specific areas and limiting the impacts created at these sites. As for SPM areas, we suggest that the Recreation Development Level should be limited to Level 2 with developed camping facilities containing no more than twenty sites. These sites allow vehicle access and are suitable for camping in tents, tent trailers, pickup campers, and small travel trailers. Figure 8 should be eliminated. These revisions clearly distinguish these sites from sites managed under Roaded Natural standards and show a progression along the recreation spectrum from SPNM to SPM to Roaded Natural.

2) A second major discrepancy of the Eastern Region Supplement is in Visual Quality Objectives. Specifically, a contradiction arises between the stated standards for visual quality and the

wording used to explain ROS and the Visual Management System in Chapter Three of the Guide.

Visual quality objectives in the Eastern Region Supplement (1985:7) are stated for SPNM as "preservation and retention are normal; objectives of partial retention are incompatible." For SPM (1985:9) "Visual Quality Objectives of preservation and retention are normal; with the objective of partial retention normal from sensitive roads and trails." These two statements are in direct contradiction to the Eastern Region Supplement (1985:21), where it states for semi-primitive areas (both motorized and non-motorized), the range is retention and partial retention with specific areas managed within modification. A number of problems are noted here. First, for SPM, why is the initial standard less for areas near sensitive roads and trails? It appears more rational that the standard be higher near those sites and more relaxed in those locations more remote from the public who draws perceptions of "natural" primarily by what they see from a road or trail. Second, the statements on page 21 clearly authorize significantly more alteration to the forest than the earlier statements. They appear more compatible with a more active, working forest where wood products are regularly and visibly harvested from clearly delineated locations. We suggest the following revision: retain the initial language of the statement on page 7 for SPNM and eliminate reference to SPNM in the statement on page 21. For SPM, it is suggested that the wording of the statement on page 21 be used to explain visual quality objectives with one exception: SPM areas would be managed for preservation to partial retention with specific areas of modification allowed away from sensitive roads and trails. The initial statement concerning SPM from page 9 should be stricken.

Lacking Standards and Guidelines

Specific standards for facilities such as boat launches and trails for cross country skiing, horse, and mountain bike use appear to be lacking. While cross country skiing, dog sledding and other non-motorized trail uses could conceivably be part of hiking trail use, activities such as ski skating, and dog sledding would not be possible on typical foot trails. Also, the sharp twists and turns that often characterize a hiking trail may not be suitable for these activities and could even pose a dangerous situation.

1) Mountain bikes are totally omitted from the discussion in any standard. Are they an appropriate use of non-motorized trails in semi-primitive areas? Ignoring this already existing and likely growing use, and allowing it to escalate without management attention, puts the Forest Service in a reactive rather than a proactive position. This may cause problems in future years. We suggest the following addition: mountain bikes are allowed on SPM and non-wilderness SPNM non-motorized trails designated open to mountain bikes. Determination of whether to designate trails as open to mountain bikes will be based on protection of resources, maintaining the semi-primitive character of the area,

compatibility with other known trail uses and suitability for mountain biker enjoyment and safety.

2) Boat launches appear to have a standard of development level 1 or 2. However, creating boat launches encourages car/truck traffic within the semi-primitive area. It may also encourage motorized boating activities which may change the character of a semi-primitive area. We suggest the following addition: designated boating access sites in SPNM areas will be limited to access for car top/carry-in boats. Boating access in SPM areas will provide, where appropriate, direct access to the water for small trailered boats, in addition to car top/carry-in craft.

Conclusion

As most Eastern National Forests enter the second iteration of their LRMP, it is imperative that the supplement that guides this planning in relation to ROS be clear, current and inclusive of the range of forest recreation activities. The suggested revisions in this paper seek to meet these qualities and to facilitate the application of ROS throughout the Eastern Region.

Literature Cited

- Brown, P. J., Driver, B. L., & McConnell, C. 1978. The opportunity spectrum concept and behavioral information in outdoor recreation resource supply inventories: Background and application. In H. Gyde Lund et al. (Tech. Coors.), Proceeding of the Workshop: Integrated Inventories and Renewable Natural Resources, pp. 73-84. Gen. Tech. Rep. RM-55. USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.
- Clark, R. and G. Stankey. 1979. The Recreation Opportunity Spectrum: A framework of planning, managing and research. USFS Gen. Tech. Rpt. PNW-98. USDA Forest Service, Pacific Northwest Experiment Station, Portland, OR
- Driver, B. and P. Brown. 1978. The opportunity spectrum concept and behavioral information in outdoor recreation resource supply inventories: a rationale. In H. Gyde Lund et al. (Tech. Coors.), Proceeding of the Workshop: Integrated Inventories and Renewable Natural Resources, pp. 24-31. Gen. Tech. Rpt. RM-55. USDA, Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.
- Lynch, J. A. and C. M. Nelson 1995. Assessment of non-wilderness semi-primitive area management on the Hiawatha National Forest. Department of Park, Recreation and Tourism Resources, Michigan State University, East Lansing, MI.
- USDA-FS. 1982. ROS Users Guide. USDA, Forest Service, Washington, D. C.
- USDA-FS. 1985. ROS Users Guide-Eastern Region Supplement. USDA, Forest Service, Eastern Region, Milwaukee, WI.

EVALUATING LAC ON THE CHILKOOT

TRAIL, ALASKA

John J. Lindsay

Associate Professor, School of Natural Resources, University of Vermont, Burlington, VT 05405

Abstract. Testing the utility of the Limits of Acceptable Change (LAC) management procedure on the Chilkoot Trail resulted in the selection of a simple, inexpensive, "change indicator" involving the capacity of a strategically placed campground along the trail. Other indicators, while potentially useful, were not practical or cost effective.

Introduction

The Limits of Acceptable Change (LAC) procedure described by Stankey et al. (1985) is a management tool for sustaining desired environmental and social conditions in outdoor recreation settings. The procedure consists of nine steps: identifying issues and recreation opportunities, selecting change indicators, identifying issues and recreation opportunities, defining standards, identifying alternatives, analyzing costs and benefits, selecting a chosen alternative for each opportunity class, implementing the chosen alternative, and monitoring for LAC compliance.

The LAC approach was used for planning visitor use of the Chilkoot Trail, Gold Rush National Historic Park, Skagway, Alaska. The planning effort was performed in cooperation with the Chilkoot Trail National Historic Park, Canadian Parks Service, Bennett, British Columbia.

The Resource

The Chilkoot International Historic Trail is the famous route of the 1897-1898 gold rush from Alaska's southeast coast through the Chilkoot Pass to Bennett, B.C. and on to the gold fields of the Klondike. Not only is the trail rich in Indian and gold rush history but it crosses spectacular natural resources. These include Pacific Coast tidal flats and sitka spruce rain forests at the trail head on the Lynn Canal and high mountain passes adorned with glaciers, snowfields, river gorges, cascading waterfalls, and glacial lakes feeding the headwaters of the Taiya and Yukon Rivers (Neufeld 1993).

The recreation experiences that take place in this rich setting include day and overnight hikes from the trail head at Dyea, Alaska to various mile posts along the Chilkoot Trail. The most popular, however, is the 33 mile end-to-end hike from Dyea over the Chilkoot Pass to Lake Bennett and the head waters of the Yukon River. Most hikers return from Bennett to Skagway via the White Pass-Yukon Rail Road, a route that was also a primitive foot and pack trail during the gold rush era, providing an alternate but much more difficult and dangerous path to the Klondike (Canadian and U.S. Park Services, CUSPS 1990).

The Chilkoot is classified as a semiprimitive, historical trail that contains an abundance of gold rush artifacts abandoned along

much of its length when it was in use as the pioneers' gateway to the Klondike. The trail is located in a relatively narrow land corridor (1/4 to 7 miles wide) owned and managed by several federal and state agencies and includes native claims acreage. The southern half (16.5 miles) of the trail is located in the United States and the northern half in Canada. There are ten campgrounds along its 33 mile length that can accommodate from 10 to 80 campers. Pit toilets are provided at all campgrounds and warming cabins and shelters at selected sites. Ranger stations are located at strategic points along the trail on both the Canadian and U.S. sides of the border. Other facilities include interpretive signs, foot bridges and natural drinking water supplies.

Why LAC for the Chilkoot Trail?

Most national historic sites are located in more populated parts of the country and serve many thousands of visitors each year. The Chilkoot Historic Trail is quite unique in that it is remotely located in semi-primitive backcountry, 33 miles long, located in two countries, and administered by the Canadian and U.S. Park Service (CUSPS). The abundant artifacts abandoned by the gold seekers along this historic route create a major preservation and protection challenge for CUSPS. While entertaining a growing number of visitors drawn by the trail's fascinating history, management must simultaneously protect a diverse, high quality, semiprimitive natural environment.

In 1972, about 1000 people hiked the Chilkoot Trail. By 1994, that figure doubled. Visits to all the Alaskan units of the Park (Skagway, The Chilkoot Trail, Dyea, and the White Pass) have increased an average of 4 percent annually since 1986 to a record high of almost 160,000 in 1994 (K.L.G.O. GMP 1995). Managers expect another substantial increase in use during the Trail's 1997 centennial year.

To cope with the potential changes that these and future increases in use pose for the Trail and its environs, CUSPS included the LAC approach in their 1994 environmental assessment planning for the Park. The objectives of the study were to identify limits of acceptable change in the trail's natural and social environments and to institute appropriate management actions if those limits were approached. The following describes how the LAC procedure was applied in this planning effort and includes an evaluation of its utility under the Trail's particular circumstances.

Change Indicators

Key to the successful use of LAC is the identification and measurement of change indicators in the trail's physical, biological, and social environments. A decision is then made whether change has reached unacceptable levels. Each indicator is linked to an acceptable change limit previously set by park managers. If the limit of change is reached, managers respond by implementing prearranged management alternatives to cope with the identified problems (Stankey et al. 1985).

The following were initially chosen as LAC indicators for the Chilkoot Trail: visitor numbers and attitudes, number and condition of campsites and shelters, condition and adequacy of pit toilets, purity of water supplies, trail tread conditions, demand for alternate side trails, the Taiya River stream bed, and changes in the corridors flora and fauna. The next tasks were to set limits

for each of these indicators and then determine how each would be measured.

Visitor Numbers and Attitudes

The CUSPS staffs have been collecting continuous data on the Chilkoot Trail since 1989, including the annual number of hiking permits. Most hikers use the trail during the months of June, July, and August. The average number of hikers per party is three, so a fairly accurate estimate of total hiker numbers was available. The problem with this measurement, however, is that, although it candidly presents past and current user numbers, it does nothing to fix a limit on the number of hikers that can use the trail at one time while maintaining a quality outdoor recreation experience. To achieve this goal, park managers were committed to defining use limits. But the question remained: what should those limits be?

A recent attitude study of Chilkoot Trail users (Elliot 1994) determined that hikers displayed an indifference to current trail impacts and that they did not support limiting trail use at the time the study was completed. Study participants were not opposed to limiting use in the future if "...the park's natural and cultural or visitor resources were threatened." The CUSPS staffs however, have documented several occasions when the use of key campgrounds was at or over capacity and were convinced that use limits should be considered. Park planners recommended that Elliot's study, or one like it, be conducted every 5 years to see if hiker attitudes toward the trail experience changed.

Number and Condition of Campsites

Campsite space is limited along the trail because of restrictive terrain and self-imposed, uneven deployment of campers along the trail. The number of campsites vary in each campground from a minimum of 6 to a maximum of 26. The majority of hikers spend their first night at Canyon City campground (7.8 miles from the trailhead) and then hike to the last campground (Upper Sheep Camp) before climbing the Chilkoot Pass, some 4 miles distant, on the following day. Sheep Camp has long served as a popular staging area before hikers (and historically, gold rushers) ascend the pass. As a result, this campground, and consequently the first Canadian campground (Happy Camp) on the north side of the pass, receive the heaviest use and are the first to reach capacity (Elliot 1992). The options for dealing with campground crowding were simply to allow congestion to continue (deemed unacceptable), redesign the campgrounds for greater capacity, or impose use limits. Proposed limit indicators ranged from documenting a 25 percent increase in soil and vegetation impacts to campgrounds being filled to capacity 50 percent or more of the time.

Shelter Capacity and Condition

Log cabins and canvas shelters are available for emergency purposes at selected campgrounds. Excessive wear and vandalism were identified as the use limitation indicators. Possible management options were to allow the shelters to deteriorate and remove them, maintain and eventually replace them, or increase their numbers if warranted. At minimum, the park would monitor their condition and take periodic photographs to document changes in their structural soundness.

Sanitary facilities

The current number and condition of pit toilets serving each campground (average one per campground) seem to be adequate to meet present needs during most of the season. If increased use resulted in an adequate number of units, unsanitary conditions or visitor inconveniences, either more units would be added, maintenance increased, or demand decreased by reducing visitor numbers.

Water supplies

Surface water supplies are abundant along most of the Trail's length. Creeks and streams running beside campgrounds are popular water supply sources. Potential source contamination, particularly where hikers are concentrated in campgrounds, was an issue although not a past occurrence. Personal treatment of all water collected along the trail is strongly advised by park management. Water borne disease infections could result in increasing prevention awareness programs, water quality testing, and treatment using captured water supply facilities. The number of visitors could also be limited, thereby reducing the potential for surface water contamination.

The Trail

The trail tread changes from a two foot wide path to the width of an old haul road and then simply to a way marked by cairns over surface rock. Ample foot bridges of varying construction take hikers over creeks and streams. The trail has developed mud pools from hikers walking around wet soil sections. Rock rubble obstructions and occasional washouts also present recurring problems. Change indicators proposed by the planning team included increased visitor complaints of deteriorating trail conditions to dangerous conditions caused by over use. Trail impacts could be diminished through redesign and construction measures or limiting hiker traffic.

Demand for Alternate Side Trails

Two side trails at Canyon City and the "Cut-Off" offer alternate hiking experiences for visitors. Other potential side trail opportunities include routes to adjacent mountain valleys, overviews of river canyon scenery, and exploring historical sites. Side trails constructed at key locations could engage hikers as they waited for campsites to open at Sheep Camp before climbing the Pass. Park officials have been reluctant to develop new side trails, however, reasoning that these trails would reduce the focus on the park's major attraction, the historical Chilkoot Trail. Other potential problems might include the undue exposure of historical artifacts, increasing costs, and environmental impacts. The planning team suggested "demand-for-alternative-trail-indicators" ranging from hikers venturing off the main trail and creating "pioneer pathways" to the public requesting that more side trails be built from the Chilkoot.

The Taiya River

The Taiya River is a fast-running, high volume river that discharges melt water from the Chilkoot Pass south to the Pacific Ocean into the Lynn Canal. It is a geologically active river that deepens its canyon, cuts its banks, and changes its stream channel. Past attempts at river bank stabilization to prevent road washouts and damage to bridges, campgrounds and the trail have proven less than successful. The LAC issue raised was how much, if at all, the free flowing river should be altered to protect

human-made facilities in a semi-primitive, backcountry setting. Could threatened facilities be relocated allowing the river to continue its natural flow dynamics? Public pressure to alter the river's channel may be seen as an encroachment on the Tuya River's wild river characteristics and as the further development of the semi-primitive river valley. Proposed limits of acceptable changes ranged from stream bank stabilization using natural materials to prohibiting artificial structures. A visitor interpretation program involving the stream flow characteristics of the river was suggested for greater public understanding of what seems to be its naturally destructive behavior. The role the river has played in carving an access way to the Klondike could be emphasized.

Flora and Fauna

The Chilkoot Trail corridor lies at the northern extreme of the maritime hemlock-spruce-cedar temperate rain forest. The vegetation is a mosaic of old growth conifers, peatlands, alpine vegetation, and successional communities growing in recently disturbed sites. Plant diversity is high in this transitional zone that includes maritime and continental species. Because of large differences in elevation, precipitation, light conditions and soils, there is a rich variety of vegetation and wildlife that uses the corridor at least some time during the year (Paustien et al. 1994). The area around Sheep Camp, for example, has been identified as quality bear habitat (ADFW 1993).

The 1897-1899 gold rush years saw almost total destruction of forest cover and wildlife populations along a broad corridor of the Chilkoot Trail. Trees were felled by the pioneers for badly needed construction material and fuel (Neufeld 1993). Several indigenous wildlife species were heavily used for food and fur. In the 100 years since the gold rush converted the Chilkoot Trail to a heavily-used road of commerce, forest cover has reestablished itself and wildlife has returned to the Tuya River valley.

Some vegetation loss results from clearing trail sides and campsites and the use of a small amount of wood materials for bridge construction. As campgrounds reach capacity, there is a tendency for them gradually to increase in size as campers create new sites in which to pitch their tents during crowded conditions. Limits of acceptable change suggested by the planning team included documented heavy vegetation loss along the trail and in campgrounds because of overflow conditions.

Practical Limitations of LAC on the Chilkoot

The KLG0 park managers and planners considered each proposed indicator of change for practicality of implementation. Factors included cost of measuring and monitoring the indicator, ease of carrying out the chosen management alternatives, public acceptance of management's initiatives to control change within acceptable limits and Park Service guidelines. Inflated user volumes can be associated with overcrowding, environmental impacts, and decrease in user satisfaction. If limits were to be set on the number of visitors using the trail, park management considered where to set the limits, how would access be rationed, and what would be the cost of operating the visitor management system? Each LAC indicator was evaluated against these considerations.

The first indicator, visitor numbers, is dependent on and set by the results from monitoring other change indicators. If impacts are deemed unacceptable, use limits are set and maintained for future implementation. Visitor attitude monitoring had a fortunate start with Elliot's 1993 survey of hikers on the Chilkoot. Periodic replication of his survey by the Park Services would be useful but expensive. Budget constraints on available personnel to gather data periodically from hikers is a limitation with this indicator.

Shelter capacity and condition involves user demand, maintenance, and construction costs. The few log cabins along the trail are old and deteriorating. Replacement costs are high. The canvas/platform shelters are new, in good condition, and will probably be retained for hiker safety reasons. Rapid deterioration or vandalism will force a replacement cost decision by management. If user caused impacts mount too rapidly, this indicator would suggest visitor number control. How unacceptable impacts would be measured and when deterioration would demand structural replacement is subject to opinion, and therefore, this indicator is weak in that regard. Sanitary facilities (pit toilets) also have direct maintenance, replacement, and increase in unit costs. If restricted budgets dictate adequate maintenance levels and funds are limited to replace or add more units per campground, then hiker numbers need to be kept at levels that do not demand greater investment in these facilities. Measuring or observing the inadequacy and degradation of sanitary facilities at campgrounds is time demanding on a limited staff and is subject to public and management opinion, making this indicator a difficult one to measure.

Monitoring surface water quality would be an almost impossible task. Even if water sampling was restricted to the vicinity of campgrounds, length of season, water volumes, flow rates, and the dynamics of organism contamination, would make the task technically complex and cost prohibitive. This indicator was, therefore, deemed infeasible.

The physical condition of the trail itself seemed to be an obvious LAC indicator, but how does one define acceptable condition and measure those components? Trail width would have to be measured at close intervals along the trail. Poor drainage areas and wash outs would have to be periodically mapped and their condition documented. Such mapping efforts require large commitments in staff time, equipment, record keeping, and analysis. But if current trail conditions are going to be compared with acceptable, predefined limits then accurate measurements are necessary.

The demand for alternate side trails, as a LAC indicator, involves changing the recreational, natural, and historical environments of the Chilkoot corridor. The benefits of such development are offering more hiking opportunities and taking pressure off existing campgrounds along the Trail; particularly Sheep Camp, the last campground before hikers ascend to the summit. The costs of adding new side trails are in construction, the impacts associated with visitors spending more time in the corridor, and lessening the importance of the historical Chilkoot Trail route to the Klondike. The "demand-for-alternate-side-trails" indicator may or may not be associated with real demand for use of the main trail. Small special interest groups might be the source of

such development pressures so this indicator was also thought to be unacceptable.

The LAC indicator involving the Taiya River considered the stream's flow characteristics and attempts to protect facilities using stream bank stabilization. This indicator was thought not to be directly associated with visitor demand, but potential river channel changes could be affected by special interest groups.

Changes in flora and fauna indicators were recognized as directly associated with visitor impacts but technically complex and expensive to measure. To determine if resident or migratory animals were affected by increased human use of the Trail is difficult, even when using scientific study methods. Plant destruction is perhaps easier to show, and yet, periodic mapping and measurement would have to be conducted along the 33 mile trail. Under present operating restrictions, park management felt the LAC flora and fauna monitoring procedures were not feasible.

So the question remained: how could the historically significant Chilkoot Trail be managed to guard against unacceptable changes that would seriously affect its value? The solution suggested by CUSPS management was simple, inexpensive to carry out, and directly related to the natural carrying capacity of the Trail. The indicator chosen to represent the limits of acceptable change for the Chilkoot Trail was the number and condition of campsites in existing campgrounds. Because of the strategic location of Sheep Camp on the south side of the border, and the fact that more than 90 percent of visitors hike the trail from south to north (Elliot 1994), it was recognized as the key site for LAC monitoring (Elliot 1992). The restrictive nature of its terrain results in a finite number of campsites, and therefore numbers of hikers, that can be accommodated at this pivotal campground proximate to the Chilkoot Pass. The campsite build out planned for this location is 28 sites. Happy Camp, the first campground on the Canadian side of the Pass, has used all feasible campsite terrain and is at development capacity of 25 sites.

While all seven LAC indicators would probably have proved useful for managing the Chilkoot Trail, all but one had technical, economic, or policy limitations associated with their use. Environmental factors are usually complex and costly to measure, and current budget constraints do not encourage sophisticated LAC data collection. The most efficient method of managing a LAC program for the Chilkoot Trail was identified as limiting camping facilities based on terrain limitations. Visitor permits will be allotted based on campground capacity. Because of current terrain restrictions, the system's capacity will not be

increased. The simplicity, efficiency, and low cost of the campground capacity indicator made good sense to CUSPS management and will result in maintaining quality visitor experiences on the Chilkoot Trail.

Literature Cited

Alaska Department of Fish and Wildlife. 1993. Field observations for the U.S. National Park Service, Summer 1993. Alaskan Regional Office, U.S. National Park Service, Anchorage Alaska.

Canadian and U.S. National Park Services. 1990. A hiker' guide to the Chilkoot Trail National Historic Park. Canadian Parks Service, Whitehorse, BC.

Elliot, T.W. 1994. Attitudes towards limiting overnight use of Chilkoot Trail National Historic Park. Masters Thesis. University of Montana, Missoula. 110p.

Elliot, T.W. 1992. Developing a use limit program for the Chilkoot Trail National Historic Park. Misc. paper. University of Montana, Missoula, 33p.

Neufeld, D. 1993. Chilkoot Trail Yukon Gateway. Yukon National Historic Site, Canada. 83p.

Paustian, et al. 1994. An ecological survey of the Chilkoot Trail management unit of the Klondike Gold National Historic Park. Skagway, AK. U.S. Forest Service; U.S. National Park Service, Anchorage, AK.

Stankey, G.; Cole, D.; Lucas, R.; Petersen, M.; Frissell, S. 1985. The limits of acceptable change (LAC) system for wilderness planning. U.S. Forest Service, Intermountain Forest and Range experiment Station, Ogden, UT GTR INT-176. 35p.

U.S. National Park Service. 1976. Master Plan: Klondike Gold Rush National Historic Park. Skagway, AK and Seattle, WA. 69p.

U.S. National Park Service. 1993. Public review of preliminary alternatives for Klondike Gold Rush National Historic Park, Skagway, AK and Seattle, WA. 59.

U.S. National Park Service 1994. General Management Plan Klondike Gold Rush National Historic Park, Skagway, AK, and Seattle, WA. Unpublished.

**PERCEPTIONS OF AND PREFERENCES FOR
SECURITY BY MICHIGAN STATE FOREST
CAMPGROUND CAMPERS**

Paul R. Johnson

Research Assistant, Department of Park, Recreation and Tourism
Resources, 131 Natural Resources Building,
Michigan State University, East Lansing, MI 48824

Charles M. Nelson

Assistant Professor, Department of Park, Recreation and Tourism
Resources, 131 Natural Resources Building,
Michigan State University, East Lansing, MI 48824

Abstract: A 1995 survey of registered campers in Michigan state forest campgrounds supported granting limited law enforcement authority and providing enforcement training to campground managers, who currently lack both. This supports the recommendation of a statutorily established state forest recreation citizen advisory committee and input received at public information meetings concerning this recommendation. Management implications include clientele support for safety and security efforts and needs to select managers compatible with this new responsibility.

Introduction

The Michigan State Forest campground system provides rustic camping experiences at 148 campgrounds in the mostly rural northern two-thirds of Michigan. The campgrounds are small, with a mean of 22 sites and all are found next to an inland lake, Great Lake or river. Visitation at the campgrounds annually is approximately 125,000 camp nights (1 party camped on 1 site for 1 night). The system is managed by the Michigan Department of Natural Resources (MDNR) Forest Management Division (FMD). Campground managers manage a "circuit" of campgrounds that they visit a couple of times a week to conduct maintenance, collect fees from the self-registration fee pipe and make public contact (Nelson 1996).

One major management challenge for natural resource recreation providers is visitor, facility and resource security. With few enforcement personnel, large acreages, expensive equipment and a sense of freedom inherent in recreation behavior, the challenge of policing natural resource-based recreation environments is substantial (Nelson 1995). The challenge for the FMD in providing an acceptable measure of security in its campgrounds is that its campground managers lack the legal authority to enforce campground rules. This authority is vested with state conservation officers. Conservation officers patrol the campgrounds on a limited, as-time-permits basis. Other competing uses of their time such as fish, wildlife and environmental law enforcement often take precedence. For violations of state law beyond state forest land use rules (e.g., serious misdemeanors and felonies), campground managers must rely on certified police officers from local units of government,

the state police or conservation officers. The lack of authority for campground managers and perceived lack of patrol by those with legal authority, has led some to flaunt the law, gambling that a conservation officer will not be present to ticket a person who refuses to pay a nightly camping fee or disregards quiet hours.

In 1991, the Michigan State Forest Recreation Advisory Committee (FRAC) was created by statute (Michigan Public Act 115 of 1991). It was established to provide citizen input to the MDNR and the Michigan legislature on forest recreation matters and to develop a strategic plan for state forest recreation. Committee members were selected by the director of the MDNR. They included representatives of forest recreation, hunting and fishing, conservation, preservation, tourism and forest products interests. In addition, representatives from other land managing entities such as the Michigan State Parks and the US Forest Service were available as resource persons and to ensure coordination.

As part of FRAC's draft strategic plan, first publicized in 1994, the committee proposed to improve visitor, facility and resource security in the campgrounds. This would be done by providing training and law enforcement authority similar to that of Michigan State Park rangers for selected FMD employees who manage state forest campgrounds. This would allow them to enforce a set of state forest land use rules including those that regulate use of state forest campgrounds. The rules cover campers paying the nightly camping fee (all of which is used to fund campground operations), protection of campground facilities, enforcement of quiet hours, and limiting the number of vehicles on a site. Powers granted to those with limited law enforcement authority would include the ability to cite violators for a civil infraction and to evict. Campground managers would not have the authority to detain or search. Training would consist of 200 hours of training focused on understanding authority and proper procedures in citation and eviction, diffusing confrontations, heightening awareness of potentially serious law enforcement situations and procedures to take in such instances, use of communication equipment and relationships with local and state law enforcement agencies. All law enforcement agencies currently involved with law enforcement within state forest campgrounds will continue in their current roles, therefore providing an overall increase in visitor, resource and facility security (State Forest Recreation Advisory Committee 1995).

The public comments at a series of 9 public information meetings held by FRAC in early 1995 across Michigan were very positive toward the limited law enforcement proposal. However, relatively few of the more than 500 people who attended the meetings stated that they were state forest campground campers. Therefore, as part of marketing study of state forest campers proposed for summer 1995, a series of questions related to camper support for the proposal and security overall were included.

Objectives

The principal objective of this study is to determine if the state forest camping public supports this proposal for limited law enforcement authority for selected campground managers over the current situation of managers having no legal law enforcement authority. Secondly, it is to determine if there is an association between the perceptions of campers regarding their current sense

of security and other campers obeying the rules with their level of support for limited FMD campground rule enforcement authority.

Methods

The data for this study was gathered as a part of a summer 1995 study of Michigan state forest campground campers. That comprehensive study was designed to assess trends in the state forest campground camper market since comparable studies in 1983 and 1987 and a report is currently available (Nelson 1996). It was also designed to explore camper preferences for alternative courses of management action, including visitor security issues, issues related to the Americans with Disabilities Act and willingness to pay fees for selected facilities and services.

A self-administered 29-item, 78-variable questionnaire was used to elicit data from registered campers. A registered camper is the individual on a campsite who registers his or her party. Sampling was done in 24 geographically stratified campgrounds, with 12 in the Upper Peninsula and 12 in the Lower Peninsula. Survey administrators distributed the survey to a maximum of 10 registered campers (if that many sites were occupied and the registered camper was present) systematically selected with a random start. Sampling was done when campers were most likely to be present and available, during lunch or dinner times.

The protocol was, after a brief introduction to the research project, the survey administrator would leave the questionnaire with a pencil and a promise to return to collect the completed questionnaire. Typically, respondents reported the survey took about 20 minutes to complete. After distributing the other questionnaires to the rest of the sample for that campground, the researcher would return to collect the completed instrument, check it for omissions, clarify any points on which the camper was unsure and receive any comments. Those sampled who had not completed the questionnaire were given the option to place it, when completed, in the campground fee pipe.

Data when gathered were entered onto diskette and analyzed using the Statistical Package for the Social Sciences. The data was weighted to correct for 2 potential biases. The first was campground use bias. There were sizeable variations between the number of camp nights in the sample campgrounds. Large, busy campgrounds were often undersampled due to the upper limit on the number of those sampled in a given day. Conversely, lesser used campgrounds could be oversampled. To correct this bias, responses were weighted by the proportion of camp nights in the sample campground compared with the other campgrounds sampled for the previous year.

A second bias was the length of stay. Those who stay many nights were more likely to be sampled than those who stayed one night. Accordingly, the data was weighted to correct for the length of stay bias. This was done by weighting with the reciprocal of the length of stay. For instance, if a camper stayed 3 nights, the camper's responses were weighted by 1/3, whereas a camper who stayed 1 night was weighted by 1/1 (Lucas 1963). The purpose behind both weights was to follow a basic principle of one person gets one vote.

Results

During the summer of 1995, 998 registered campers were sampled. Of those, 872 (87%) returned completed questionnaires. When asked:

"Currently, only conservation officers have the authority to enforce state forest recreation rules such as nighttime quiet hours, payment of fees, restrictions on vandalism and littering, etc. in campgrounds. These officers typically number 2 per county. They also have other duties including natural resource, fish and game and environmental law enforcement on all lands. The State Forest Recreation Advisory Committee, a citizen advisory group required by law, has recommended that selected state forest campground managers be trained and certified as rangers (similar to Michigan state park rangers) with legal authority to enforce state forest recreation rules and also maintain the campgrounds. The committee's rationale is to increase efficiency and public service. Campground managers would not be involved in natural resource, fish and game or environmental law enforcement. Conservation officers would still enforce state forest recreation rules as their other duties permit. Do you support this proposal?"

This proposal was supported by 72% of the respondents, opposed by 12% and 16% were undecided. When asked to rate their current sense of safety and security in the campground where they were sampled, 80% of respondents replied that it was either good or very good, 16% said that it was average, and only 4% replied that it was either poor or very poor. When asked to rate their perceptions of others obeying campground rules in the campground where they were camped, 72% rated rule compliance by others as good/very good, 22% as average and 6% as poor/very poor.

Pearson's chi-square was used to test for association between support for the proposal and the sense of security and others obeying the rules. Those with a sense of security rated good or very good were significantly more likely to support the proposal for limited law enforcement authority than those with an average, poor or very poor sense of security ($X^2 = 8.193$ 1df $p = .004$). There was no significant difference between those with a good or very good perception of others obeying the rules versus those who perceived rule compliance as average, poor or very in their support for the proposal ($X^2 = .052$ 1df $p = .819$).

Management Implications

The results of this study show that Michigan state forest campground campers strongly support state forest campground managers being trained and certified as rangers, with the authority to enforce campground rules. This is noteworthy as a sizeable majority already have a good sense of security and perceive that other campers generally comply with the rules. This suggests that campers who already perceive a favorable security situation want to keep that sense of security in the future. It also suggests that campers are willing to have more enforcement of the existing rules, showing support overall for the existing set of rules. Finally, the public input gathered by the 9 public informational meetings appears to have been a relatively accurate reflection of the support for the proposal, although few

participants directly identified themselves as state forest campground campers.

For this proposal to be most effectively carried out by FMD, employee selection criteria need to be revised to include an increased emphasis on human relations and communication skills (Sampier 1990). The public must also be informed of this change in campground management and the authority of campground ground managers to encourage compliance rather than confrontation. One key way that recreation law enforcement differs from traditional policing is that it emphasizes compliance over sanctions. This means the focus is proactively on the prevention of illegal behavior, not the apprehension of those who have already committed an offense (McLanc 1992).

Implementation of limited law enforcement authority

Following the public information meetings, FRAC presentations and this study, the Michigan Natural Resource Commission, the policy making body of the MDNR, unanimously approved Forest Recreation 2000 as official MDNR policy in November of 1995. The legislation necessary to carry out limited law enforcement authority and some other provisions of the strategic plan was introduced in the Michigan House and Senate during January 1996. At this writing (May 21, 1996), the legislation in slightly differing forms had passed the House and the Senate. An acceptable compromise and the governor's signature are expected within days. In both chambers, there was agreement with the limited law enforcement segment of the bills. In anticipation of the bills becoming law, the FMD has sent many of the

campground managers to the existing Michigan state park ranger training program.

Literature Cited

Lucas, R. 1963. Bias in estimating recreationists' length of stay from sample interviews. *Journal of Forestry* 61:912-914.

McLanc, D. 1992. Bureau of Land Management law enforcement. Presentation by Chief Ranger of BLM to the 1992 Park Law Enforcement Association Annual Law Enforcement and Visitor Protection Workshop, Reno, NV. 12p

Nelson, C. 1995. Camping, trails and dispersed recreation. East Lansing, MI: Michigan State University, Michigan Agricultural Experiment Station, Special Report No. 78. 31 p.

Nelson, C. 1996. Trends in Michigan state forest campground campers 1983-1995. East Lansing, MI: Michigan State University, Department of Park, Recreation, and Tourism Resources. 26 p.

Sampier, S. 1990. If you don't carry a gun and handcuffs. *Journal of the Park Law Enforcement Association* 6(2):14-16.

State Forest Recreation Advisory Committee. 1995. Forest Recreation 2000: A Strategic Plan for Michigan's State Forest Recreation System. Lansing, MI: Michigan Department of Natural Resources, Forest Management Division, Recreation and Trails Section. 15 p.

**ISSUES AND CONCERNS FACING MANAGERS
AND OWNERS OF PUBLIC AND PRIVATE
CAMPGROUNDS IN NEW HAMPSHIRE AND
VERMONT**

Michael R. Sciabarrasi

Extension Specialist, University of New Hampshire, Department
of Resource Economics and Development, 56 College Road,
Durham, NH 03824

Robert R. Robertson

Assistant Professor, University of New Hampshire, Department
of Resource Economics and Development, 56 College Road,
Durham, NH 03824

Abstract: A survey of campground owners and managers was conducted to identify priority issues for future university research and educational outreach efforts. Owners and managers of parks in New Hampshire and Vermont ranked high issues related to campground and facility cleanliness, quality of park environment, camper behavior toward each other, visibility of park entrance, and local linkages

Introduction

Campgrounds are an important part of the natural resource and tourism industries in New Hampshire. In 1993, the New Hampshire Campground Owners' Association (NeHaCa) estimated total camper expenditures in the State at \$64.1 million with site nights rented exceeding one million.

Very little recent information regarding campground operators' assessments of business and industry well-being exist for New Hampshire. In 1995, Cooperative Extension and the Department of Resource Economics and Development at the University of New Hampshire initiated a study to understand the issues and concerns facing the owners and managers of private and public campgrounds.

A primary objective of the study was to gain a better understanding of campground operators' views on business operations, surface water quality, visitor complaints and business ownership. The results will provide extension educators and department faculty with information for identifying educational outreach and research needs.

Methods

The data to examine these issues were obtained from a 1995 survey of campground owners and managers. The survey was developed with the assistance of the Executive Director of NeHaCa. Although the questionnaire was not pretested, the questions reflected concerns, issues, and complaints addressed in similar work done by universities and agencies in other states (Holdnak 1994, Penaloza 1988, and Rollins and Chambers 1990).

The questionnaire was divided into seven sections as follows: Business description, business operations, surface water, visitor complaints/concerns, ownership/management concerns, personal information, and general concerns/comments about the industry. The business description and personal information sections were included to provide a profile of the respondents and their campgrounds. Respondents were asked to indicate the importance of statements related to business operations to assess owners-managers' opinions of business and industry well-being. They were also asked their agreement with statements related to surface water issues, to ownership/management concerns, and the frequency of visitor complaints/concerns.

Mailing lists of 206 private and public (state and county) New Hampshire campgrounds and 68 private Vermont campgrounds were obtained from NeHaCa. The list of private campgrounds in New Hampshire included members and non members of the association. The private campgrounds in Vermont were association members only.

In the second week of September, 274 questionnaires and explanatory letters were mailed to the campgrounds in the two states. A postcard reminder was sent to non respondents in early October. In late October, an additional 25 surveys were mailed to the US Forest Service in New Hampshire.

As of December, 101 usable surveys were received. Eighty-six of the responses were from New Hampshire campgrounds, 13 were from Vermont and two failed to identify their addresses. Eight surveys were returned by the postal service due to improper addressing or expired forwarding orders.

Profiles of Respondents and Campgrounds

Table 1 provides a profile of respondents. At least 70% of the respondents own the campground, consider managing the business as a primary occupation, reside at the campground, and involve family members in business operations. Most have earned a college degree or professional certificate and are actively involved with at least one professional or business association. The average length of time respondents owned or managed a campground is 10 years.

Table 1. Respondent profile

Own the campground	80%
Managing a campground is primary occupation	79%
Campground earnings are principal source of family income	54%
Family residence at campground	71%
Spouse/children involved in business	73%
Earned a college degree or professional certificate	60%
Active member of any professional or business association	72%
Years owned or managed the campground	
Five or less	38%
Six to 10	23%
More than 10	39%

When asked to indicate the importance of 12 various aspects of owning and managing a campground, the statements receiving the highest ranking were providing a quality experience, enjoy

meeting campers, and sense of control or independence. The least important aspects of owning a campground were managing and supervising people.

Many respondents (42%) intend to expand the size of the business in the next five years; however, 90% of respondents do not plan to extend the number of months that their campgrounds are open during the year. Eighty-seven percent of campgrounds opened in May with nearly the same percent (85%) closing in October.

Table 2 shows selected characteristics of the respondents' campgrounds. The means for number of campsites and acres of recreation area are 101 and 368, respectively. Respondents gave campers access to an average of 6.4 different services and 5.7 different recreational facilities. Services such as flush toilets, firewood, telephones, showers and dump stations were available at 75% of the parks. At least half the parks provided recreational facilities identified as playgrounds, game rooms, beach or water fronts, hiking or nature trails, and multipurpose sports fields. More than 70% of campgrounds were near a lake, pond, river, or brook available for recreational use.

Table 2. Characteristics of campgrounds

Average number of campsites by type	
Developed with hookups	72 sites
Modern, no hookups	16 sites
Primitive	6 sites
Other	7 sites
Average recreation area	368 acres
Most common services provided	
Flush toilets	90%
Firewood	90%
Showers	84%
Telephones	81%
Sanitary dump station	76%
General store	64%
Laundromat	53%
Most common recreational facilities provided	
Playground	73%
Game room	60%
Beach/water front	56%
Hiking/nature trails	54%
Multipurpose sports field	53%
Campgrounds adjacent to surface water available for recreational use	72%
Business organization of private parks	
Sole proprietorship	44%
Partnership	13%
Corporation	24%
Publicly owned parks	18%
Campgrounds hiring employees	
Part-time, seasonal	58%
Full-time, seasonal	46%
Part-time, year round	17%
Full-time, year round	20%

Most of the respondents were private parks operated as sole proprietorships. Private corporations were the second most common form of business organization. Only 18% of

respondents managed publicly owned parks. Nearly 60% of respondents hired part-time seasonal employees, while 46% hired seasonal employees on a full-time basis.

Business Operation Issues

Respondents indicated the importance of 25 different statements concerning business operations. Table 3 lists the three issues with the highest percentage responses in each of the four categories.

Table 3. Important business operation issues

<i>Very Important</i>	
-	Cleanliness of campground facilities
-	Camper respect for other campers
-	Quality of environment at campground
<i>Important</i>	
-	Activities available to campers in the local community
-	Recycling of waste
-	Camper convenience
<i>Somewhat Important</i>	
-	Participation in local government
-	Industry wide programs
-	Links with other businesses in the state
<i>Not Important</i>	
-	Availability of funds from local banks
-	Family involvement in business
-	Commercial/residential encroachment

Issues emphasizing the quality of the park environment and campers' behavior toward others were *very important* to campground owners-managers. The three business operation concerns most often checked as *important* by respondents were related to local activities, waste recycling, and camper convenience. Statewide networking and involvement in local government were only considered *somewhat important*.

Many park owners-managers downplayed the significance of available local bank funds, family involvement, and intrusion from development. These issues labeled as *not important* may not be a concern rather than not being an important concern. For instance, funds may be readily available from local banks or funds from local banks may not be needed. This distinction should be kept in mind when interpreting survey results.

Surface Water Issues

Respondents with water frontages on a lake or pond (approximately 48%) were asked to what extent they agreed with 12 statements related to surface water. Table 4 classifies each statement in one of three categories according to the majority of survey responses. The percent is the portion of respondents, with a lake or pond available for recreational use, classifying the statement as designated in the table subheading.

For the most part, campground owners perceive the water quality of lakes and ponds to be good with limited problems. Targeted regulation may be warranted on a limited basis, e.g., banning jet skis at selected sites; however, there is no consensus that additional surface water use restrictions need to be put in place.

Table 4. Agreement with surface water issues

<i>Strongly Agree or Agree</i>	
- The fisheries are very good	65%
- Timely solutions exist for water quality problems	46%
- Jet skis should be banned	42%
<i>Neither Agree nor Disagree</i>	
- Zebra mussels are a problem	50%
- Number of boats need to be limited	43%
- Size of boat motors should be reduced	38%
<i>Disagree or Strongly Disagree</i>	
- Campground run-off contributes to water quality problems	83%
- Additional boat mooring and/or docking facilities are needed	57%
- Algae and "scum" are a problem	50%
- Drunk or rowdy boaters are a problem	50%
- Milfoil is a problem	41%
- The levels of non point pollutants need to be reduced	37%

Visitor Complaints

Respondents were asked how often they heard 25 different visitor complaints. The top three complaints for each survey category are shown in Table 5.

Level of insects and visibility of campground signs are two complaints frequently reported by park visitors. Two other common visitor complaints were cleanliness and pets not on leashes. Complaints seldom heard by park owners-managers involved other campers being inconsiderate, noise level, and campsite prices.

Complaints with respect to litter, water clarity, and garbage pick-up were among the least reported by visitors. The frequently reported complaint about cleanliness may not be related to trash such as paper, but rather to other measures of cleanliness such as toilet sanitation.

Table 5. Visitor complaints and concerns

<i>Very Often</i>	
- Cleanliness	
- Amount of insect pests	
- Visibility of campground sign or entrance	
<i>Often</i>	
- Amount of insect pests	
- Pets not on leashes	
- Visibility of campground sign or entrance	
<i>Seldom</i>	
- Inconsiderate campers	
- Level of noise	
- Price of campsites	
<i>Never</i>	
- Litter	
- Clarity of water	
- Garbage or trash pick-up	

Ownership/Management Concerns

In this section, respondents indicated to what extent they agreed with 16 statements about campground ownership/management.

Responses were viewed as either supporting or refuting prior observations.

Expectedly, owners-managers strongly agreed or agreed with statements recognizing the significance of campgrounds to the tourism industry and the importance of campers to the local economy. A strong majority also recognized the need to cooperate with adjacent property owners and local businesses.

With respect to prior observations related to visitor complaints, more than 90% of park owners-managers agreed or strongly agreed with the need for well designed welcoming signs to attract campers. Nearly 90% felt that campsite rental fees were fair.

Regarding surface water, most respondents neither agreed nor disagreed with the statement that surface water quality is deteriorating. Also, most park owners-managers neither agreed nor disagreed with the position that campground operations are restricted by environmental regulations. The only concern with which most of the respondents disagreed or strongly disagreed stated that the quality of the environment at campgrounds had been reduced because of pressure from use.

With respect to other issues, the campground owners-managers tended to agree with the statement that professional tourism efforts are cost effective, but neither agreed nor disagreed with the cost effectiveness of State efforts. Most neither agreed nor disagreed that the lack of available bank loans has prevented expansion, development of local communities has reduced visitors, or insufficient demand has prevented business expansion or facility improvement. These latter positions support earlier observations about business operations.

Conclusions

Through this survey, campground owners and managers have shared their views of business and industry concerns. As important, owners and managers have also shown their indifference to certain issues.

The issues identified as important concerns related to improving the cleanliness of campgrounds and facilities, maintaining the high quality of the surrounding park environment, instilling camper respect for other campers, improving the visibility of campground entrances and use of signage, and establishing better links with local businesses and communities. These issues need further attention in terms of research and/or educational outreach efforts. Strategies to address these issues will be relevant if they are developed with assistance from a cross section of industry representatives.

Several issues were unimportant to campground owners and managers. Availability of funds from local banks and involvement of family members were not important operational concerns. Also, park owners-managers were indifferent with respect to issues about local development and residential encroachment. Lastly, operators were positive about the quality of the surface water and the environment.

The results reported were a combination of opinions from operators of both public and private campgrounds. Further analysis by type of ownership may show different results for the

two groups. In addition, size of business may influence outcomes. Managers of smaller campgrounds may have different concerns than those overseeing larger parks

Literature Cited

Holdnak, Andy. 1994. Factors impacting the satisfaction of private campsite owners with campground recreation operations. In: Proceedings of the 1994 Northeastern Recreation Research Symposium: 1994 April 10-12, Saratoga Springs, NY, U.S

Department of Agriculture, Forest Service, Northeastern Forest Experiment Station: 93-95.

Penaloza, Linda J. 1988. State and private campgrounds: competition or complimentary?. Madison, WI: Wisconsin Department of Natural Resources: Working paper. 8 p

Rollins, Rick; Chambers, Doug. 1990. Camper satisfaction with Canadian park service campgrounds. In Joanne Vining (ed.), Social Science and Natural Resource Recreation Management. Boulder, CO: Westview Press. 91-103.

**Recreation
Management
Administration**

Demarketing in Park and Recreation Management

Christopher Groff

M.S. Candidate in Parks and Recreation Management, Michigan State University, Department of Parks, Recreation and Tourism, 131 Natural Resources Bldg., East Lansing, MI 48824

Abstract: Demarketing can occur at all levels government, i.e., federal, state, and municipal, and also in the private sector. Demarketing is a viable way to reduce the demand of a product, service, program or park area. A demarketing plan consists of steps that will complete the mission to reduce demand, and if chosen as a demand-reducing option, should be part of the organization's or agency's strategic plan.

Marketing and Demarketing

The popular conception of marketing is that it deals with the problem of furthering or expanding demand. Whether one takes the traditional view that marketing in parks and recreation is finding customers for existing products or the more recent view that it is developing new products for unmet consumer wants, it is seen as a management technology that brings about increases in visitors and facility use and, in turn, an increase in how much money the facility takes in. The marketing professional in parks and recreation should use product, price, place, and promotion variables. Marketing is seen by some as a "fair weather" profession, one that seems important during periods of excess supply. In this respect, marketing differs from other business functions that are critical during all stages of the economy, i.e., accounting, manufacturing, and human resource elements.

But this is not accurate. True, if marketing professionals are seen as responsible for finding customers and drumming up demand, they seem unnecessary when demand becomes great. However, in practice, excess demand is as much of a marketing problem as excess supply. A park and recreation agency may need to reduce total demand or the level of demand in a certain demand state without damaging the visitor experience, the relationships with the various users, and the image of the agency. Philip Kotler coined the term "creative demarketing" in the early 1970's. Reviving his ideas about marketing management is appropriate. This idea can be easily adapted by parks and recreation managers. More formally he defines demarketing as, "that aspect of marketing that deals with discouraging customers (visitors, users) in general or a certain class of customers (visitors, users) in particular on either a temporary or permanent basis." The same marketing principles that deal with shrinking demand or deliberately discouraging segments of the market call for all the major marketing tools. As such, marketing is just as relevant to the problem of reducing demand as it is to the problem of increasing demand. Kotler identifies three types of demarketing (Kotler 1971), two of which are directly applicable to park and recreation managers:

1. *General demarketing*, which is required when an organization wants to shrink the level of total demand.

2. *Selective demarketing*, which is required when a company wants to discourage the demand coming from certain customer classes.

3. *Ostensible demarketing*, which involves the appearance of trying to discourage demand as a device for actually increasing it.

Demarketing and Demand States

Before I describe and explain the two types of demarketing that park and recreation managers should focus on, defining the various demand states is necessary. Since demand is usually the focal point of demarketing, the relationship between demarketing and demand states is crucial.

Demarketing can be described as marketing in reverse (Mahoney 1995). One of marketing's main goals is to influence the level, timing, and character of demand in a way that will achieve an organization's objectives. The same can be written about demarketing in park and recreation management.

Eight different demand states have been described in the literature (Kotler 1982). Each demand state presents different implications for marketing. I deal with the states of demand that are more relevant to demarketing strategies in greater length however.

1. *Negative demand*. A market is in a state of negative demand if a major part of the market dislikes the product and pays a price to avoid it. In some situations, customers may be willing to pay additional fees or costs to avoid facilities they dislike, i.e., paying more for a cleaner park to avoid a polluted one.

2. *No Demand*. In this demand state, target consumers are disinterested in the service or facility, i.e., some markets are not interested in an existing or new type of recreation activity.

3. *Latent Demand*. Many consumers share a strong desire for something that is not being satisfied by an existing facility or service. Latent demand deals with a situation where there are no close substitutes, i.e., an urban population's desire to run a raging river is unsatisfied because there is no river or water park in the area.

4. *Falling Demand*. Falling demand is reflected in the product life cycle. It is generally characterized by lower visitation numbers and lower use levels documented by a decrease in reservations, gate counts, enrollees in programs and services, etc.

5. *Irregular Demand*. Many organizations face demand that varies on a seasonal, daily, or even hourly basis, causing problems of idle capacity and over-full capacity. Managers and marketing personnel will want to include demarketing strategies in their marketing plans. Irregular demand reveals problems associated with fixed costs and budgets, regardless of use or visitation. Fixed costs are analyzed by looking at the overall operation cost per user or visitor.

6. *Full Demand*. Full demand occurs when a park, facility, or program's social and/or biological carrying capacity has been reached. Managers are focused on maintaining use without deterioration of the resource or visitor experience. The

organization strives to maintain the demand level while maintaining quality and consumer satisfaction.

7. Overfull Demand. Some organizations face a demand level that is higher than they can handle. Many US national parks are currently in this state. Resource depletion, crowding and decreased levels of visitor satisfaction are common problems during periods of overfull demand. A demarketing solution is the rationing of recreation experiences, i.e., river rafting permits that allow access on the Colorado River.

8. Unwholesome Demand Unwanted demand in most cases. Types of user behaviors or facility-related uses considered damaging to the resource, the facility, or the user, i.e., graffiti, vandalism, ORV use in non-designated areas, and the operation of a snowmobile while under the influence of alcohol or drugs. Demarketing can be useful in trying to reduce an activity or behavior that constitutes unwholesome demand.

I have added a sub-level to unwholesome demand- incompatible demand. Generally, incompatibility is judged by the parks and recreation professional and it addresses activities that are not suitable to the sustainability of the resource, or recreational activities that are not compatible with each other for environmental or safety reasons.

Demarketing in Parks and Recreation

Many of our national parks, public lands and natural resource areas are facing excess demand for one or more types of recreation or visitor experiences. In a responsible parks and recreation organization, however, attempts are made to act in a framework that respects the marketing concepts of parks and recreation--i.e., visitor satisfaction in harmony with resource protection. It is possible to distinguish at least three different situations that may lead to general demarketing by a Park and Recreation agency or organization. Let us consider each situation briefly.

Temporary Shortages

Many park and recreation agencies find themselves in a situation where the programs or the experiences that they have to offer are in excess demand. Sometimes the excess demand can be a direct result of the management's underestimation of demand for that park or program offering. In other cases, it is attributable to the lack of supply, i.e., national park lands in the peak tourist season. The following are examples of reactions to supply shortages:

1. The National Park Service has determined that the extremely high demand to run the Colorado River over the last 20-30 years during the spring and summer months must be apportioned by permits. The high demand has not only created a shortage of available river space that affects navigability and safety, but has created a shortage of solitude in the river basin. The permitting system allocates permits to commercial and noncommercial users to navigate the river. About 24,000 permits were given out in 1995. The waiting list for a noncommercial permit is from seven to ten years (Aler and Glick 1994).

2. The amount of off road vehicle use for recreational purposes is increasing every year. ORVs, however, can damage landscapes and interfere with other types of recreational activities, so they are

designated to specific "open zones" by the BLM and other public land management agencies. The problem with this designation process is that many of these open areas are becoming overused, and are further damaging what is left of the landscape. This problem is a result of open land scarcity. A demarketing solution would be issuing a limited number of licenses based on the geographical area's carrying capacity on a parcel by parcel basis.

Steps can be taken to encourage reduced consumption and overall demand by setting up the classic marketing instruments in reverse (Kotler 1971). To cause a reduction in resource consumption, overuse, and program demand, marketers and managers can:

1. Decrease advertising and promotion for the park, facility, program, or recreational activity.
2. Create a rationing program, apportionment, or permitting program. Managers can meet demand on a proportionate level. The park or facility can satisfy x% of total demand. The supply can also be allocated to a favored public(s), much like the National Park Service does Colorado River permits. About 70% of the permits are allocated to commercial users as compared with noncommercial users (Wilderness Public Rights v. Kleppe 1979).
3. Increase entrance fees, license fees, permit costs, and program fees.
4. Change the allocation system to a "first come first serve" basis until biological and social carrying capacities have been reached.

Policies for allocating supply and reducing demand should be made by park and recreation managers with marketing professionals playing a major role in advising what impact the alternatives would have on the visitors, users, and participants. Each general solution must keep in mind some degree of public disappointment.

Chronic Overpopularity

There are some situations where a recreation area or program is over popular. The management of the facility or program is geared toward lowering demand levels. Two situations can be distinguished in the field. The first, is when the popularity of a particular park area may be posing a serious threat to the quality of the recreation experience, and also damaging the actual resource that attracts the visitors. The National Park Service has attempted to reduce demand in some of our national parks by implementing management innovations that focus on resource and visitor experience protection. The management plan is officially called the Visitor Experience and Resource Protection Plan. Arches National Park in Utah has been working with the VERP plan since the summer of 1995. One of the main problems that park managers face is crowding. The NPS wants to keep the visitor happy by managing for a quality recreation experience, which comes hand in hand with resource protection and sustainability. The National Park Service used social research studies evaluating visitor preferences and experiences as a base for the development of VERP. They were inclined by the results to provide for a better quality recreation experience and protect the resources that attracted the visitors. The NPS also used biological indicator studies to develop indicator species, develop biological carrying capacities for particular park areas, and park

zones that mirrored the Forest Service's Recreational Opportunity Spectrum zones. The VERP plan is in part a demarketing management technology. The plan is aimed at reducing visitor levels in certain zones of Arches National Park to preserve the quality of the visitor experience and the park's resources.

According to Park Service figures, visitation increased system-wide by 30% in the 1970's and climbed another 35% in the 1980's. Officials predict that by the end of the century, another 60 to 90 million people, above and beyond today's record 275 million, will annually visit the National Parks (Wilkinson 1995). From 1974 to 1984, annual visitation at Arches National Park grew from 238,000 to 345,000. In the last ten years, visitation has doubled to 777,000. There is no reason to believe that this number will not double again over the next two decades.

After decades of ignoring the warning signals, park managers are realizing the hurdles that they must clear to protect the natural resources, preserve park aesthetics and maintain the quality of the visitor experience. The popularity of our national parks has become a product of their own demise. VERP is being pioneered by the Park Service, charting a promising new course for visitor management and biological stability. Before the decade is over, VERP may be used to save many of America's crown jewels from problems attributable to overuse and crowding. The VERP program at Arches and other participating parks is a pilot-test in park management because it will define how many people can be doing what, when, where, and how within the park.

In the second situation, overuse and crowding are results of the managers and policy makers inability to plan for and cope with a high level of demand. Parks are attractive to visitors for a variety of reasons ranging from aesthetics to recreation. With some parks instituting limits on visitors and hours of use, lines of cars and crowded parking lots and fringe areas become frequent occurrences. This type of congestion detracts from the park's solitude and natural beauty and is probably not what the visitor intended to see on his trip to the park. Demarketing would be helpful in this situation. The parks could simply turn away the "extra" visitors, or offer a substitute area or activity. Raising the entrance fees, parking fees, or concession prices is also a demarketing alternative. However, price increases may be viewed as inequitable. The problem with most state and federal parks is that they are scarce resources related to the problem of limited supply. Decreasing demand for a resource when the resource is scarce is difficult and there are no close substitutes.

High demand can lead to overuse and crowding. The NPS already recognizes it has problems related to overuse at many national parks. Rainbow Bridge National Monument is a good example of these problems. Rainbow Bridge was remote and only accessible by foot until the construction of the Glen Canyon Dam in 1963. The dam backed up the flow of the Colorado River into the Glen Canyon, turning the chasm into an artificial lake (Dodge 1991). Some major use-related problems at Rainbow Bridge are graffiti, vandalism, litter, trampled vegetation, crime, noise, and congestion caused by the large number of boats in the canyons leading to the bridge. These use-related problems have increased over the last 25 years and are a direct threat to the visitor experience and resources in the park. Decreasing the frequency of these problematic occurrences related to overuse

may only be possible by demarketing to decrease demand. By decreasing the demand the occurrence of these problems **should** decrease proportionally.

Visitation can be decreased in several ways. Charging fees to enter the area by foot, and also a "toll" fee to enter the canyon by boat may discourage some visitors. Besides a fee system, a social and biological carrying capacity could be set for boaters and "on foot" visitors. When one of the carrying capacities is reached, no more visitors will be allowed into the monument area. Although this seems as if it is depriving some visitors of a desired experience, it may be a necessary tactic to maintain the ecological balance of the resource and the quality of the visitor experience.

Demarketing can go one step further. The congestion problem in the artificial lake can be addressed by the NPS by demarketing the use of small boats in the canyon. The NPS could market the use of a charter boat or ferry boat system, thus decreasing smaller boat traffic on the lake, which in turn would lower the frequency of problems associated with small boats. Besides the congestion in the lake area, the rock climbing, graffiti, and "joyriding" in speedboats could be demarketed by increasing the supervision or law enforcement in the area by installing an NPS floating station or small marine safety patrols.

Rainbow Bridge's crowding problems are a direct result of its geography. It shares a border with Glen Canyon National Recreation Area that is no more than a short motorboat ride away. An objective in the demarketing plan would be to form a partnership with Glen Canyon. Pamphlets or flyers could be given to the recreation area's visitors that would inform and educate them on the differences in conduct and use rules between the Glen Canyon Recreation Area and the Rainbow Bridge Monument Area.

Product or Service Elimination

Demarketing is sometimes called for when a park or recreation organization would like to eliminate a program or the use of a particular facility. Examples of demarketing strategies are personally informing the enrollee why the program is being dropped, offering a full refund and a discount to another program offering, and offering substitutes outside the department. These strategies are warranted where the same residents or friends and family will enroll in other programs that the recreation department offers.

Preparing a Demarketing Plan

I have listed a set of steps that will serve as an outline for preparing a demarketing plan, and I will examine each of them by using the "crowded park" as the demarketing theme. Decreasing visitors to the park during peak hours of the peak season is our objective.

1. *Situation Assessment* The situation assessment is made up of the following components: External analysis; Internal analysis; Facility, Product, Program, and Service audits; and Marketing audits. The situation assessment should result in the following: the identification and understanding of the strategic factors of the organization; the identification of the organization's strengths, weaknesses, opportunities, and threats; the identification of strategic issues; a portfolio analysis; and the creation of a

framework for alternatives. The NPS conducts 'State of the Parks' reports every five years or so. This is the closest thing to a situation analysis that I have found in my research. The NPS needs to create a demarketing plan for the overuse problems that occur during the busy season-the first step is a thorough situation analysis.

2. Creation of Demarketing Objectives Marketing objectives are the guides to the overall demarketing strategy. They should suggest constant evaluation and they should be easily measured. A demarketing objective is no good if it cannot be measured. Setting demarketing objectives is a major determinant of sustainable success. The demarketing objectives must be concurrent with the focus, coordination, and the entrepreneurial views of the agency. There must be a hierarchy of coordinated and measurable objectives known to the staff. Demarketing objectives should specify what is to be achieved, not how it will be achieved. They should focus on affecting and servicing target publics and specify relevancy target markets. Demarketing objectives should be consistent with the expected future environment and capitalize on organizational strengths and situation opportunities. They should also recognize and address relevant organizational weaknesses and situational threats. Demarketing objectives should generate and evaluate alternative marketing mix elements for accomplishing the organization's strategic objectives. A realistic time frame should be specified for objective accomplishment. Demarketing objectives should suggest measurement criteria and methodology and also help identify partners and partnerships. Demarketing objectives may include decreasing "first-time" visitors by three percent, decreasing the number of seasonal visits, decreasing automobile travel to the park, or decreasing visits by families with young children. Alternatives to objectives are management by extrapolation, managing by crisis, managing by subjective objectives, or managing by hope.

3. Identifying and Segmenting the Target Market. Choosing the target market in which you are seeking to shrink demand. The segmentation process starts with the bases of segmentation . . . on what variables are you segmenting? Common segmentation questions are: Are the segmentation variables measurable? Are the segments homogeneous? Are the segmentation bases practical? Are the segmentation bases relevant to the Facility-Products-Programs-Services? After the bases have been chosen, the actual grouping takes place based on a univariate analysis, cross-tabs, clustering, or a discriminant analysis. The groups are then profiled using other variables in a multivariate analysis. Finally, an assessment is done of the market segment. The assessment involves an examination of the relationships between the market segment and the mission and objectives, the return on investment, and the feasibility or capability of sustainable service and sustainable resources.

4. Create Target Market Objective Relevant objectives must be established for the target market segments. These are objectives that need to be accomplished within your target market. They should be consistent with your marketing objectives, i.e., decreasing visits during prime visiting hours for families with two or more children within a 50 mile radius.

5. Positioning Your Program, Facility, or Service.

Organizations must be concerned with how they are perceived by their priority publics and target markets. How they perceive the mission, competence, park or program, facility, or service is vital. The image of an organization is the sum of beliefs, ideas and impressions that individuals and organizations have about the organization. Images are built on perceptions and equal the function of deeds and communications, but rely more on what the customers' perceive and what an organization does, not what it says it does. What images do the different publics have of my organization? What has most influenced these images? Is the image consistent with how you perceive yourself or how you want to be perceived? How can you go about establishing the desired image in the minds of your publics? These are image management questions that are helpful to ask at this stage in the demarketing process. Positioning should be relevant to the mission statement and to the organization's objectives. The organization should be proactive and constantly concerned about its image. Different publics need different positioning strategies. Your position can be mapped on a positioning grid, which will graphically illustrate where your organization is positioned in the eyes of your priority publics. Your position should be constantly monitored and assessed. Positioning must be consistent with an organization's marketing mix to accomplish accurate positioning.

6. Create Demarketing Mix Objectives. The demarketing mix objectives must coincide with overall objectives of the demarketing plan and strategic plan. Demarketing mix objectives are centered around the target market(s) or publics. They guide the demarketing mix by giving shape to the type of mix that will be used and by helping to define some elements of the mix.

7. Develop the Demarketing Mix. The role of each element of the marketing mix- product, price, promotion, and distribution-should be examined for its contribution to an integrated demarketing strategy. The elements of the mix should support and complement each other to develop differential advantages in each of the selected target audiences or publics. A different demarketing mix is usually necessary for each target market.

8. Monitoring and Evaluation. The demarketing plan must be evaluated and monitored. Managers should assess the demarketing plan and ask questions such as: Is the program achieving its objectives? What can be done better? Should we maintain, subtract, or add to our current mix? Besides internal assessment, social, biological, and economic research can test the success of a demarketing plan. Examples of this research in parks and recreation are visitor impact studies, spending patterns, trip lengths, visitor profiles, visitor and user preferences, and evaluation surveys. The data collected from scientifically sound research can be valuable to someone involved with demarketing.

The Need for Demarketing: Practical Examples

Demarketing campaigns for any organization must have clear, attainable, and measurable objectives. In park and recreation management there are some common problems, usually linked to a particular demand state, that demarketing attempts to solve. I have researched some problems that exemplify the need for demarketing. Sometimes, demarketing techniques are already being carried out, but they are not recognized as demarketing.

Conflicting Use

A parks and recreation agency must decide what is the primary use of its fields, trail system, beaches, facility, etc. Manager's decisions are linked to user safety, the compatibility of use with available resources (sometimes non-renewable or scarce), and the different uses and programs demanded by that agency's publics.

Problems arise in policies of allocation, rationing, and apportionment. A little physics comes to mind . . . "every action has an equal and opposite reaction." Demarketing can help solve the conflict between recreation seekers by shrinking demand in one type of activity and marketing the demand for another. Questions will arise such as: Which activity should be chosen as the activity that will be demarketed and why? What will be the mix for marketing this "secondary" activity?

A park and recreation administrator will face situations with a high demand for certain activities that conflict with other activities due to safety or facility and land-use, and in cases where there is a resource compatibility conflict. A solid demarketing plan will attempt to lower the demand in the target publics to help solve the conflicting use problem.

Overuse

Crowding and overuse in our national parks, state parks, and at other facilities is a large problem for recreation managers. Crowding of a park can lead to a decrease in the quality of the visitor experience, traffic and parking problems, resource damage, law enforcement problems, and general safety concerns.

Referring to VERP, the plan has goals to set visitor limits for specially zoned park areas by determining a carrying capacity for each zone that follows the objectives of the NPS- providing a quality visitor experience and protecting limited resources (supply). The NPS is trying to shrink demand (visitor numbers) by setting limits on the amount of visitors allowed to enter certain areas of the park. The NPS is using the VERP plan to decrease and manage demand states at levels determined through the Service's research of the biological impacts of people on the park and the effects of crowding on the visitor experience. Studies that have focused on the social carrying capacity of recreational lands and crowding regarding the visitor experience have been conducted before VERP's inception as a management plan (Manning and Lime, 1993; National Parks and Conservation Association. et al. Colorado State University, 1995).

Vandalism, Graffiti, and Litter

Detrimental acts committed by deliberate offenders such as vandalism, graffiti, and litter are common problems that managers must prepare for and attempt to discourage. However, the ever-increasing amount of visitors and the increasing demand for various kinds of activities in already troubled areas places the responsibility of prevention on the park managers, policy makers, planners, local law enforcement, and field staff. Managing and controlling visitors while the park is closed has become just as important as managing the park while it is open.

The demarketing mix to handle each type of unwanted demand will be different. Decreasing vandalism at a park facility could include a mix of increased law enforcement, Public Service

Announcements that warn against certain activities, and a brochure aimed at educating the target groups on the costs of their actions and the legal penalties that await them if they are caught and prosecuted. The mix for graffiti would be similar, but the creative addition of a graffiti wall or graffiti stone that would let the vandals "vent" on a targeted area may result in a decrease of incidents in other areas.

Littering can be demarketed by using a promotion campaign--i.e., the nationwide campaign featuring Woodsy Owl and other characters with the famous tag slogan, "Give a hoot, don't pollute." The mix to promote this program was mostly via the radio and the TV. A promotional campaign made up of Public Service Announcements, brochures, and leaflets was developed to discourage littering in our forests and parks. Besides the media, the Forest Service used educational and interpretive programs to help fight the littering problem.

Each demarketing mix has different target markets in mind, different objectives to follow, and different communication elements. Demarketing to decrease unwholesome or unwanted activities/actions requires a mix that changes according to the type of activity you are trying to abate or eliminate entirely.

Discussion and Implications

Demarketing is a management tool that can be used to help alleviate demand-related problems in park and recreation settings. There is a need for market research to identify the problems that visitors perceive in the parks, to determine social and biological carrying capacities, and to determine limits of acceptable change. These types of studies need to be conducted usually before demarketing strategies can be applied or included in the strategic plans of an organization or agency. Researchers and managers therefore need to work together to solve these demand-related problems through carefully planned research and planning.

Literature Cited

- Aler and Glick. 1994. Crowds and Conflicts. *Newsweek* 42: 47-52
- Dodge, Sue. 1991. NPS Overlooks Overuse at Rainbow Bridge. *National Parks*. 65: 17-19
- Kotler, Philip. 1971. Demarketing, Yes Demarketing. *Harvard Business Review*. 12: 34-41
- Kotler, Philip. 1982. *Marketing for Non-Profit Organizations*. 2nd ed. Englewood: Prentice-Hall. 45, 67, 78, pp.
- Mahoney, Edward. 1995. *Marketing Planning Lecture*, Michigan State University. *Marketing for Natural Resource Organizations*.
- Wilderness v. Kleppe. 1979. US Court of Appeals, 9th Circuit. 446 US 982 (1980)
- Wilkinson, Todd. 1995. Crowd Control. *National Parks*. 69: 27-32.

Issues in Developing Effective Measures for Decisions of

Use/Attendance/Benefit Changes Over Time

Jay Beaman Ph.D

Adjunct Professor Colorado State, Lakehead & University of Waterloo; Auctor Consulting Associates, Ltd.

Ed Thomson, MA
Senior Researcher, Atlantic Region, Department of Canadian Heritage.

Abstract: There are different perspectives from which one can address accuracy and appropriateness of annual, monthly and daily use counts and even dollar receipts. This paper shows why accurate monthly figures from fiscal accounts and visitor use are not generally the most appropriate statistics to compare performance between years. The link between concept and "accuracy" is examined based on factors contributing to variability in certain data. Better trend measures are presented. It is argued that good measures should not exhibit confounding influences of weather and the way the calendar is structured. A way that such measures can be computed with minimal added cost is given.

Purpose

This paper is to show that typical "performance" measures such as trends in monthly attendance figures that are being used by managers and politicians for taking or supporting decisions and to report on trends in consumption of leisure services are often not, from a logical and mathematical statistics perspective, the most reliable or most appropriate statistics to employ given how they are being used. It is also to show that there are alternatives that are better and that are not costly.

Introduction

Given the recognition as early as the 70's (e.g., see Theobald 1979) that funding for leisure services was in trouble without justification for the money being spent, one finds many volumes of statistics on leisure service provision. There are many types of statistics. These are tied to funding and used in policy, planning and other management documents (i.e., see Knudson 1984 or Zinser 1995). How much time is spent comparing attendance for this month to "comparable" figures for other years? If a difference is found what does it really imply? Does it imply that one year a month had 5 weekends and in the other it had 4? How often has the weather been given as the cause for differences between two years with no clear idea how much effect the weather really has on the statistic?

To understand what the issue is here consider that a recreational visit has been defined by Parks Canada and the US Park Service, as "A recreational visit is a person entering (a site, facility, etc.) to participate in an appropriate recreational activity." Assume that all visitors to a service/facility/park must buy a \$1.00 entry ticket good for the day of their visit and that it is understood that if the person comes on another day then that will be a different visit. Given that accurate records of cash are kept then one has

both cash and a visits figures that are 100% accurate for a day, week, month or year. It might seem that comparing a monthly total for July 1995 to that for July 1996 or comparing a 1995 total to that for 1996 would give a "perfectly" accurate %-change figure. In a way it does. However is there 100% accuracy when a difference of up to 20% can occur because the month compared has 5 weekends in one year and 4 in the other? Was there different weather? Or, is a change that is observed actually a reflection of a fundamental change in client behavior? Given the possibilities one must suspect that any change observed could reflect any of the influences noted and possibly other ones. Just by avoiding errors introduced by the way the calendar is structured, one can improve on %-change computed from "raw" monthly figures. The monthly visit and cash data clearly are "crude" for estimating some trends that are important to decisions.

The accuracy problem with changes in attendance has actually been recognized by Parks Canada since soon after systematic attendance reporting began in the 70's (Stanley and Beaman 1990). From the mid-70's until 1995, attendance at a park or site was computed by multiplying various visual and mechanical counts by conversion factors and adding up the results. It was also in the 70's that Parks Canada adopted a 20% rule for reporting why attendance in a given month differed from that for the same month a year previously. Now, as occurs elsewhere (Knudson 1984 p. 350) some parks do not use accurate information to estimate their attendance. In other cases, for practical purposes, counts and multipliers used are 100% accurate. Given the accuracy of some of the attendance figures Parks Canada has questioned the reasonableness of the 20% rule. For some locations, it seemed that even a 5% decline or increase in attendance should not occur by chance. Regardless of what seemed reasonable, two studies by statisticians¹ failed to establish a better operational criterion than the 20% rule for identifying "significant" enough change that a reason for the change should be provided by a park.

Problem Statement

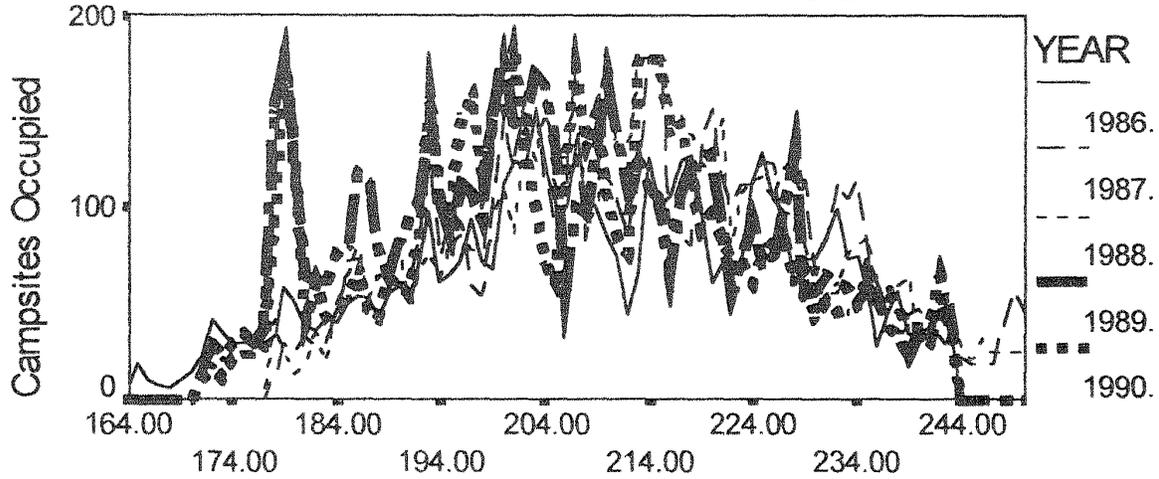
The preceding has made the point that having well collected and accurate statistics about what an organization does on a day to day basis, good operational statistics, does not assure having good information for decisions in relation to trends in use or revenue. Collecting counts and revenue for many services, counts for various entries (pool, theater, park); and counts for trails and roads, whether or not easily done as part of operations, is not generally costly and is seen as providing justification for the resources being used. The obvious question is: How can better use be made of financial, use count and other daily data that it is common for leisure service organizations to have?

Figure 1 shows daily data for two campgrounds for the summer seasons of 1986 to 1990. Basically, what one sees are counts that increase to midsummer and then decline and that also fluctuate weekly. The nature of "date" (X-axis) on the figure may seem

¹With limited accesses to computer (one in the 70's and one in the early 80's- reports cannot be found) of extensive time series of attendance data.

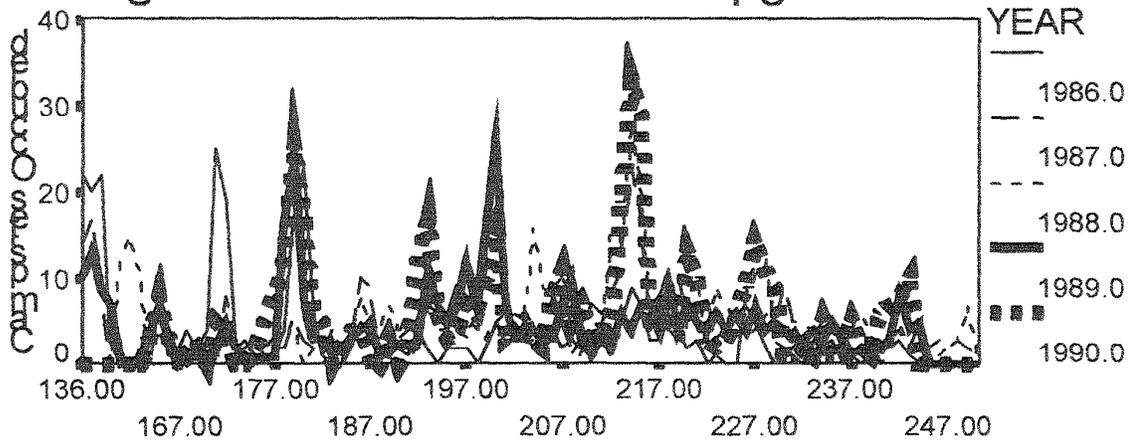
Figure 1: Site Use for 2 Fundy National Park Campgrounds

Figure 1A: Point Wolfe Campground



GDAY: For explanations see part B of the figure and the article.

Figure 1B: Wolfe Lake Campground



GDAY(Day of the year adjusted. See the text for details)

The peak at roughly 179 is the Canada Day weekend peak while 214 is the Aug. 1 weekend. 166 is roughly 15 June while 245 is roughly 1 Sept.

odd in that one may have expected to see dates. However, when several years of data are displayed their weekly cycles for different years must be shifted. The variable "gday" shown on the x-axis gives the number of days in the year up to the day for which a datum is plotted, however, there is a year specific "shift" imposed to cause Saturdays, Sundays etc. to coincide between the years.² In the figure 1986 is a base so one sees markers showing 15 June 86, 1 July 1986, Canada Day, and similar days up to 1 September 1986. The other years are shifted the smallest amount possible to get days of the week to align (87 is shifted 1 day, 88 is shifted 2 days and because of leap year 89 is shifted 3 days in the opposite direction rather than 4 days in the same direction as 87 and 88, etc.). The big "bulge" for Canada Day seems to be in June because July 1 was a Tuesday in 1986 resulting in the emphasis being on the weekend before. Superimposed on the general pattern are peaks and hollows which are clearly not associated with holidays. Some of these show the influence of weather and some show the influence of large groups traveling together. In summary in Figure 1 one can recognize:

- I. Special events
 - a) Festivals/celebration in or otherwise influencing a park
 - b) Unique unexpected events like a bridge or road closure or even a large group of users coming together
- II. Calendar based cyclical patterns
 - a) Annually events that recur on the same date (e.g., Canada Day and 4th of July)
 - b) Annually events that are moved to create a 3 day weekend (August long weekend)
 - c) A general annual pattern (i.e., an increase from spring to a summer peak and then a drop to zero in the fall).
 - d) Excluding holidays, a weekly cycle with the day of the week, at least for July and August for nonwinter activities
- III. Calendar based administrative patterns (beginning and end of operation, change from weekend only, capacity adjustment etc.)
- IV. Weather related variation.

In the figure one sees large fluctuations from day to day and year to year. One might conjecture that these related to the weather. Actually, after that conjecture it was discovered that part of them related to "windstream" caravans. Some almost certainly relate to large groups of other types coming together. What is not obvious from the figure is what happens when the data shown are aggregated so as to report on performance in July or August. Both July and August have a holiday and both have 31 days. However, some years July has 5 weekends including a high volume holiday while in other years it has 4 and August has 5 weekends. The point is that for services that load heavily on the weekend, data totaled for July or August, or any other month, of one year is not really comparable to a month's data totaled for another year. *The number of weekends is a potentially major cause of any difference observed.* Comparing the same months between years should really involve some kind of general "standardization" such as used in demography to correct fertility

²A formula based on the date arithmetic used in computers can be used to without problem up to 2000 when the lack of a leap year causes a 1 in 400/year adjustment to the formula.

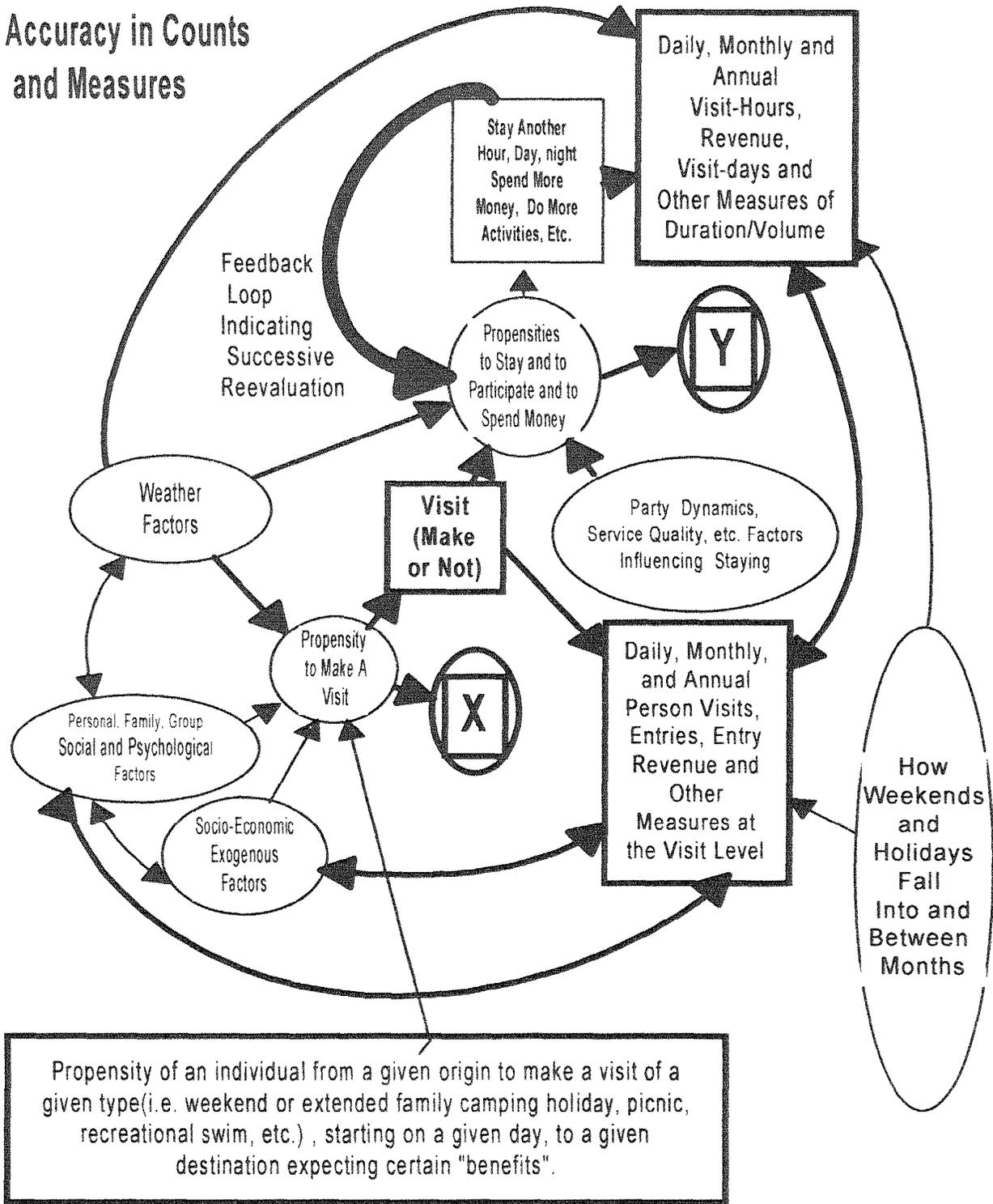
rates for differences in age distributions of populations being compared (e.g., see Barclay 1959, Kitagawa 1964). To compare two different months like July and August, not only is there the factor of weekends and weekdays, one probably does not expect the same total even if numbers of days in the month and numbers of weekends are "controlled." Having a basis for comparison so that a difference is zero if there is "no underlying change between the months" is desirable. What one really needs is an unbiased and efficient estimate of the real rate of growth or decline in use or revenue. One needs a rate like a seasonally adjusted unemployment rate.

One scientific approach to developing an understanding of what one sees in Figure 1, which should lead to better measures, is to determine which variables contribute to the variability that one sees and how. If there were 1) no anomalies caused by special events or administrative action, 2) no random variation, 3) no variation due to factors like weather, and 4) no year to year trends, then all of the curves seen in Figure 1 should fall on top of each other. However, there are the kind of factors listed above causing variation. Though Figure 2 follows some conventions for defining "causal" models (Hayduk 1987), it is just meant to give a general perspective on causality. To the right in rectangular "output variable" boxes numbered 1) and 2) one sees reference to the kind of "operational data" shown in Figure 1 and to the monthly and annual aggregates of these data that one frequently sees published. Also on the right of the figure one sees an elliptical shape connected to the output rectangles 1) and 2) by arrows. The note in the ellipse specifies sources of variance already noted: how holidays fall in a month, how many weekends there are in a month, when there were special events and administrative factors. The arrows indicate that these should all be viewed to "cause" the outputs to have the values that they exhibit.

The figure is indicating that values of variables like revenue and related visitor counts that are literally 100% accurate are caused to vary by a variety of variables. As already noted, having 5 weekends in a month can have real consequences for monthly totals. But, does a user of the data want to think that use is growing when a large %-change is caused by comparing a 5 weekend month to one with 4 weekends? As for nonrecurring special events, including attendance associated with these in monthly or annual totals along with usual use counts and then making comparisons is not logical. No pattern or trend is to be expected in totals for nonrecurring events. If the kinds of unwanted sources of variation between months noted can be corrected for non-trend factors, for example, by dropping problem days in one month and similar problem days in the other month prior to getting totals and calculating rates of change based on a "standard" 28 day month of 4 weeks, then leisure service agencies can be making decisions based on better information.

When one examines Figure 2 one sees that it implies that weather causes changes in "propensities" to behave in certain ways. Propensities are indicated as defining the likelihood that a visit of a given type is made starting on a given date and what or how much is consumed. According to Figure 2, weather influences propensities and propensities determine the magnitudes of

Figure 2: Causal Paths and Correlations Related to Accuracy in Counts and Measures



outputs such as those listed in rectangles 1) and 2). But then isn't it propensities or, e.g., use and revenue based on these and how they are changing that should really be used in much planning and management decision making? In the figure one finds an X and a Y in a rectangle surrounded by an ellipse. An X-type measure for July 1986 would, for example, be an estimate of total visits or entry fee revenue for "good" weather with no special events and with Canada Day and the August 1 holiday related use adjusted based on a long-term average pattern. The X-type and Y-type measures can be thought of as the leisure science equivalent of the seasonally adjusted unemployment rate.

Theoretical Formulation

Beaman and Smith (1976, Beaman 1985) defined a model based on a smooth function and a peaked function which, when added together, yielded the kinds of patterns that one sees in Figure 1. Figure 3 provides examples of both smooth functions and peaked functions. The Functions are for a hypothetical service for different years between 1986 and 1990. The functions are given for 5 years so that one has a feeling for how year to year growth might result in a new smooth or peaked function that is shifted up or down. Figure 3A for peaked functions may appear cluttered and complicated, however, all that one really sees are two peaked functions, one for 1986 and one for 1990. The peaks are based on a pattern that repeats every seven days. It is convenient to think of this pattern as defined by effects that range in value from 0 to 1. The pattern actually shown has the value of 0 for Tuesday, Wednesday and Thursday while the largest value is for Saturday and can be considered to be 1. The magnitude of the Sunday, Monday, or other effect on a particular day in a particular year is shown in the figure as the product of the value of an envelope function and the day effect, say a Monday-effect that applies to the particular day. The envelope value is shown in the smooth curves that go through the tops of the peaks for 1986 and 1990. They display the general pattern that peaks follow. Peaked functions are not shown for 1987 to 1989 because the figure became too cluttered.

In Figure 3 the shifting upward of envelope functions and smooth curves shows an increase in use counts. If two curves are shifted showing a 10% growth then every point on the upper curve is at a count that is 1.1 times the value on the lower curve. For the peaked functions the envelopes get closer and closer together as the years approach 1990. The first curve is determined by .5 times 1990 use counts while the other curves are determined by multipliers of .7, .85 and .95. In the case of the smooth functions the growth multipliers used to generate values for other years based on use counts in 1988. The multipliers are .8, .9, 1, 1.1 and 1.2 for 87 to 90 respectively.

In Figure 4 one sees sums of smooth and peaked functions illustrating estimates for a particular service. This figure would look more like Figure 1 if weather data were used to make it less regular in its shape. However, the goal of modeling is to derive a pattern from which influence of certain factors has been removed so far as possible so one gets better measures of what is really going on without the influence removed. The pattern is what would be expected if there were no administrative perturbations, standard weather, no special events and no holidays and special days. How to model holidays is not pursued here as there are two types 1) a standard long weekend (e.g., Monday off) and 2)

irregular holidays like July 1 in Canada and July 4 in the USA that move around in the week. The later requires a multi-year design matrix and a variety of assumptions to estimate a model. If one has estimated generic curves' relative amplitudes such as the .8, .9, 1, 1.1 and 1.2 series for Figure 3B %-growth trends in amplitudes can be calculated. An increase in amplitude in the peaked function can be taken to reflect increased use by a local/regional weekend user segment. A decrease in amplitude in the smooth function can be attributed to 1) decreased local/regional holiday use or 2) to decreased use by any of several out of region segments. Data identifying user segments is obviously cheap in some cases and allows estimates of more detail about the behavior observed.

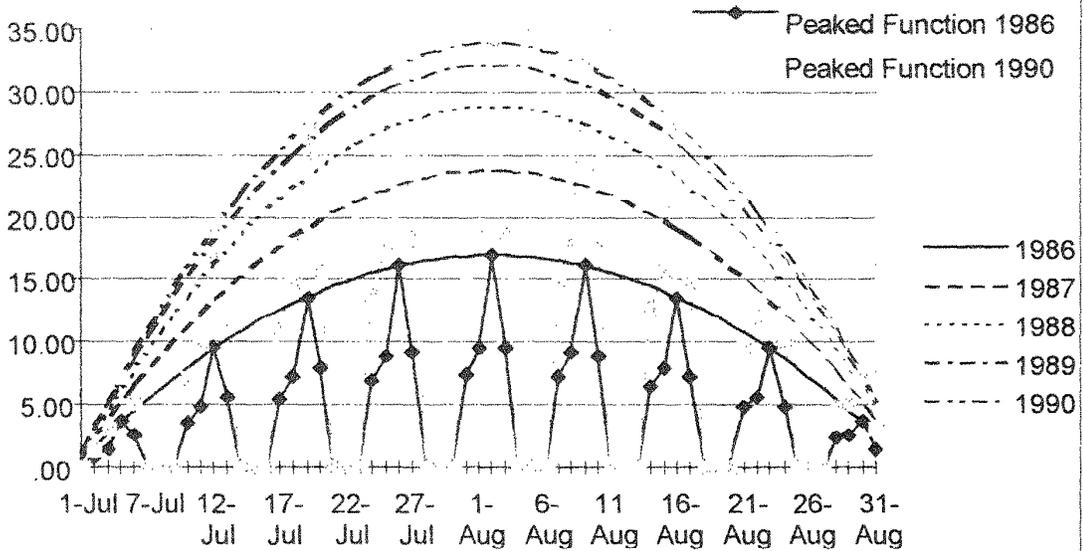
Modeling Using Nonlinear Regression

Regardless of the success of the research that was done by Beaman (1985), it was achieved using a rather large, complicated and somewhat costly to run program on a mainframe computer. That program, without intervention by a knowledgeable analyst, did not necessarily produce valid estimates. Getting valid estimates was costly in both dollars and analysts' time. The 90's have brought incredible computing power to the desktop at low cost along with software that makes the computing power readily useable. Rather than trying to estimate smooth and peaked functions as were done by Beaman (1985) in the 80's, one can specify very general functions and estimate them. Consider Equation 1 below.

The commentary above indicates that the equation is only being estimated for "regular" days (not holidays, special events, etc.). Because administrative changes between 86 and 90 influenced the use counts for June and September for Point Wolfe and Wolfe Lake campgrounds in Fundy National Park, estimation has been restricted to data for "regular" days in July and August for 1986 to 1990 Use counts and related date and min., max. and mean temperature information (purchased by Parks Canada from AES, Canada's Atmospheric Environmental Service) from two AES weather stations proximate to the two campgrounds were the inputs to the SPSS nonlinear regression procedure (SPSS 1993, ch. 7) to estimate Equation 1. It was estimated with some or all of the various functions defining it as specified below:

- $PAMP * \delta(\text{dayofweek})$ is defined by dummy variables and their coefficients ((bsuncft*suncft + bmoncft*moncft + btuceft*tuceft + bthueft*thueft + bfriecft*friecft + bsateft*sateft)) so that coefficients estimated takes on different values for each day of the week and are included in estimated for a date based on Equation 1. This means that an effect for the date is multiplied by other functions for the Peaked function and then this result is added to the result for the smooth function. In this regard each value for a day indicates the relative contribution of that day count compared to other days. The value for Wednesday was arbitrarily set to zero, and effects for other days forced to be >0. Saturday as the peak day was forced to have an effect of 1. Causing these effects to range from 0 to 1 allows the amplitude of the peaked function PAMP to have a unique value that can be estimated.
- PAMP is a constant that is estimated and that, based on how estimation is defined, expresses the amplitude of the envelope of

**Figure 3A: Peaked Functions With A Weekly Cycle
And Envelopes For 1986-1990**



**Figure 3B: Smooth Functions for 1986 to 1990 with Growth
Based on a Linear Function of Calendar Year**

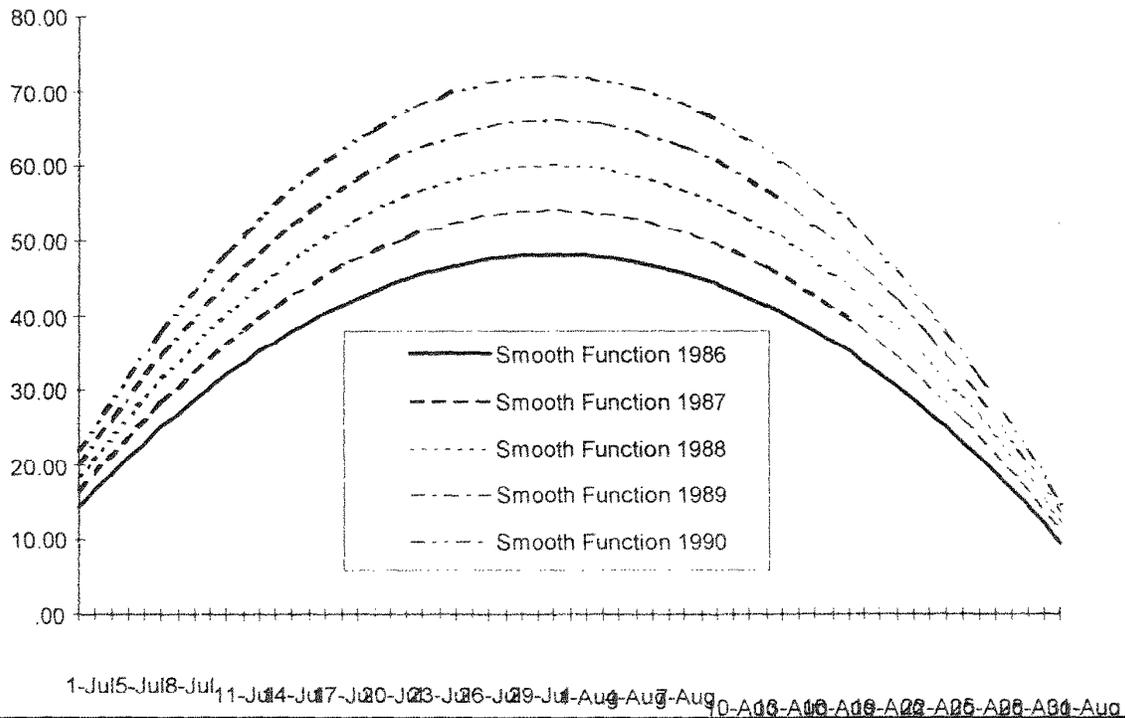
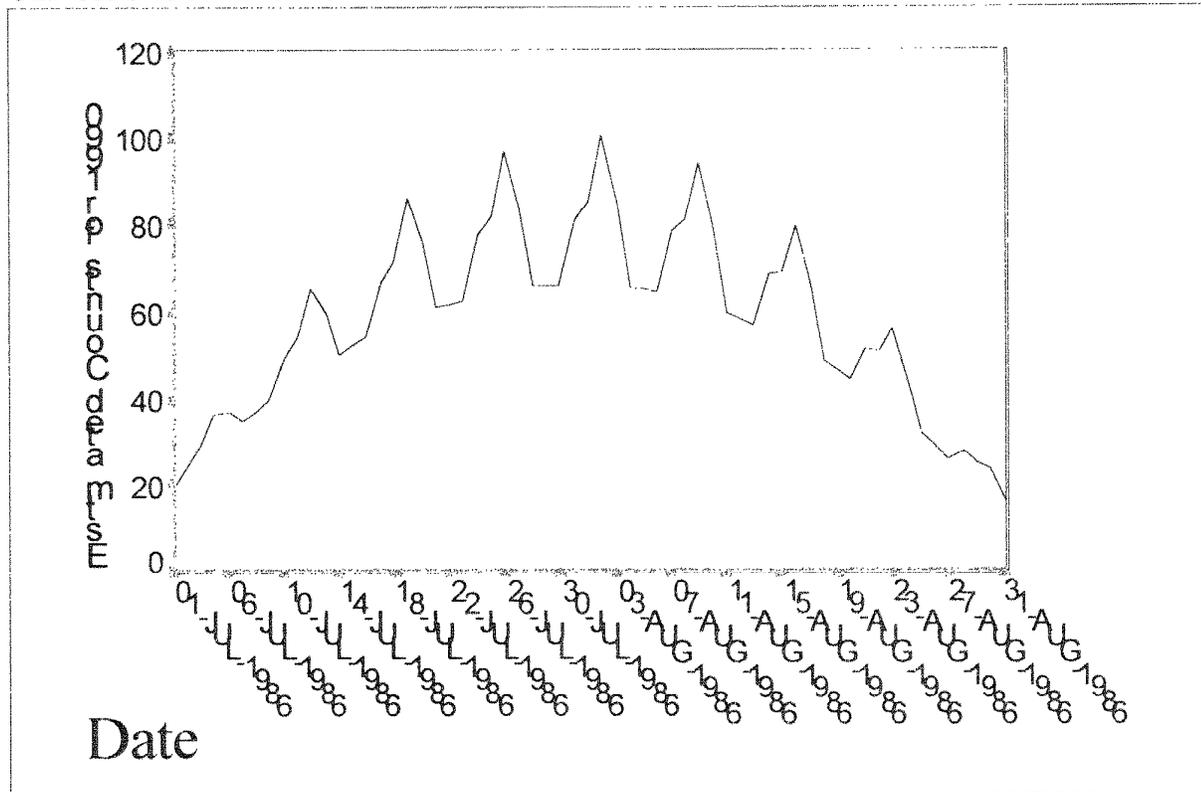


Figure 4: An Estimated Use Count Function Based on the Sum of the 1990 Smooth and Peaked Functions



the peaked function to that of the smooth function in use count units for a particular year.

- $\mu P(gdate) = 1 + pfn1 * cntgday + pfn2 * cntgday^{**2}$ allows for change of amplitude during the season (PAMP being a value applying to day 207) where cntgday is a shifted day of year measured relative to day 207. The peaked function could reflect more weekend use in the spring and fall
- $\tau P(year) = 1 + pt1 * cntyear + pt2 * cntyear^{**2}$ is the peaked function trend factor where cntyear is the actual calendar year minus 1988. For this study the use of cntyear as defined relates any trend to 1988, the central year in the range of years studied.
- $fP(\overset{P}{W}) = 1 + pw1 * temp2day + pw11 * temp2mro$ where temp2day is the high temperature today and temp2mro is the high

Equation 1.

$$Count(pca, date) = \tau P(year) \mu P(gdate) \delta(dayofweek) fP(\overset{P}{W}) + \tau S(year) \mu S(gdate) fS(\overset{P}{W}) + \varepsilon$$

temperature the next day (other functions were used but limited effort went to getting a good model with just temperature).

- $\mu S(gdate) = sfn0 + sfn1 * cntgday + sfn2 * cntgday^{**2} + sfn3 * cntgday^{**3} + sfn4 * cntgday^{**4} + sfn5 * cntgday^{**5}$ where cntgday is a shifted day of year measured relative to day 207 (cntgday = gday - 207).
- $\tau S(year) = 1 + st1 * cntyear + st2 * cntyear^{**2}$ where is centered year as defined for $\tau P(year)$.
- $fS(\overset{P}{W}) = 1 + sw1 * temp2day + sw11 * temp2mro$ where temp2day is the high temperature today and temp2mro is the high temperature the next day.
- $\varepsilon(date)$ is a random variable expressing random variation in an observation for a given date that could be expected to occur by chance.

The Results of Estimation: Implications for Better Estimates for Trends

Many regressions were run as part of the general project of defining and deriving better trend estimates. No details on these regressions are presented here as the only purpose of this presentation was to elucidate the problem, to establish feasibility and to identify matters that need to be considered. However, in general terms, one reason for making many runs was that 1) there are many problems involved in specifying functional forms, initial parameter estimates and constraints on parameters to be estimated and 2) the initial results achieved were not in accord with what was expected. From the beginning any version of Equation 1 used produced a regression that was highly significant with a variety of coefficients identified as significant beyond the .001 level (meaning that even with multiple tests they were significant beyond the .01 level). Unfortunately, significant results can be deceiving. A first interesting result was that there was a highly significant trend to increased weekend activity. Examination of residuals showed that a few observations were causing the "trend." The mention earlier of "windstream caravans" arises because determining why there was a trend to weekends allowed one to recognize that in the mid-80's caravans arrived during the week and in the late-80's they arrived more on the weekend. Their arrival made the days that they were present special since they caused 30 or more sites than would ordinarily have been occupied to be occupied. Days that they impacted on had to be identified and eliminated from the analysis as special. Whether a special event arranged by a park, a local special event, a bridge or road closure, etc. causes anomalous use, these influences should be identified so a trend analysis of regular use does not utilize data for such days. It should also be noted that by having records of different types of special days a park's plans for and budgets for special events can be related to "attendance targets." How much these targets exceed expected regular attendance is a measure of what is being achieved for what is spent.

Having realized that for the early regressions the distribution of residual error (observed-predicted) was not random, a simple model of what error should be expected was developed. This model was based on all parties using a campground behaving independently. Even with the days of caravan use removed the residuals exhibited more than twice the variability predicted. The obvious reason was that in many cases several sites are occupied by parties who are traveling (visiting) together. Unfortunately, no data were available from parties about other parties that are part of their visit "group." Such data are easily collected as part of campground registration. With it one can determine if residual variance exceeds what is expected thus showing structural problems with the model. In this regard for attendance expressed in person visit days, since average party size may be 2.5 for parties visiting by car standard deviations in attendance figures can be expected to be at least $(2.5)^{1/2}$ times as large as if individuals traveled independently. With bus tours and other large party size influences considered, very large variability in attendance can be expected compared to naive expectations.

Multiple nights of stay have been specified as differing between the visits associated with the peaked function and the smooth function. However, starting to sort visitors by segments is now recognized as only a step toward recognizing that the

autocorrelation between Friday and Saturday for the peaked function may be around .9 in some parks while low in others. As well, for the smooth function, long length-of-stay produces autocorrelation between days yet when heavy "turnover" is associated with the weekend, the highest autocorrelation probably occurs during the week. For parks that load for the week, loading on days of a particular week would be highly correlated with random variation being between the weeks.

The kinds of factors just cited have implications for estimation and for the determination of the structural adequacy of a model estimated. Though it may seem that there are many problems, it now also seems clear that with data from campground registrations (Thomson has extensive data for the 80's) and some special information collection on parties traveling together, a version of Equation 1 can be easily estimated and can really be considered to eliminate the effect of weather. Such an equation can be used to produce estimated regular attendance for 28 day months of 4 weeks with no "special" days. Comparing such figures for July 96 and July 95 either for the peaked and smooth function separately or together will then give trend data that has the influence of weather and varying numbers of weekend and special days removed. One can truly claim that for the types of regular users covered one is getting better information to plan and manage by. Furthermore, one can see that there is no need for extensive and expensive data. The problem is getting the computations done. From the work done it is possible to see that problems addressed like getting initial parameter estimates and constraints that were close enough to likely true values so that the estimates converged can be automated. Graphic output will generally allow a nontechnical person to see any serious problem in the fit to observed data. So, what is needed is a database that links weather and use so that queries made to a DSS can result in appropriate estimates. For routine publications "usual" attendance figures would come from accounting type records where as trend figures, which could be confused with rates computed from raw attendance, would be calculated for specific user segments for which it is meaningful using some equation like the one introduced above.

Managerial and Research Implications

This research has produced results that are important for decision makers. Clearly the finding that certain statistics that are currently being used are not really good for part of what they are being used for is an important finding. The positive message is that the kinds of data needed for better trend estimates are readily available to or easily collected by leisure service organizations. They are also easily managed in modern data bases and they can be used to produce better statistics cheaply. Modern DSS, decision support systems, can facilitate managers having and using this more appropriate information in taking their decisions.

This research is important to researchers in several ways. Firstly, it has only opened a highly practical line of research. It leaves a plethora of interesting and challenging problems to be pursued. Basically, it is a feasibility study and thus was restricted to a special "case" (non-holiday days of the peak summer season) for which the chances of success with available data were recognized to be good. Conjectures that standardization/corrections can be made for more complicated "cases" (e.g., the August Civic Holiday 3-day weekend or the July 1/4 Canada/US national

birthday) remain conjectures until somebody proves or disproves them. For those who are mathematically/statistically inclined, this research has only been suggestive. The data and model development possibilities have been identified for numerous research projects. For example, fascinating stochastic process estimation problems need to be solved to get a really good model to correct for the effects of weather. For those whose bent is more toward DSS, AI/Expert Systems and MIS the paper offers a challenge to implement systems. Systems can facilitate/encourage/force users of information to consider the values of what are currently judged to be a best statistics for a decision or, where there is not consensus, systems can present the decision maker with measures that different experts suggest leaving the decision taker to make an assessment of the merits of experts as well as deciding how values of particular measures will/should influence their decision.

Conclusion

In this paper concerns with reliability/effectiveness and concept appropriateness have come together resulting in what the authors see as a unique and useful perspective. Something special happened with a new look at an old problem. Furthermore, one does not need to abandon simple reporting of attendance and financial data with which people are familiar to have better trend statistics. Also there need not be new expensive data collection. Some Parks Canada locations should collect some information on parties traveling together but the most important matter is keeping what is already or readily and cheaply collected in a usable form. Readers may recognize that for many services detailed data by day, origin, etc. are collected and but are aggregate in collection or manually later. The process destroys the "raw" data that would allow good estimates to be made.

Correct accounting figures on dollars received can appear in publications while appropriate detailed data are used to produce trends corrected for weather and weekends in a month. Numbers from which trend estimates are derived need not be published. Given the technology now available, one would hope that soon an MIS/DSS system will query a user about purpose and, without the client having to be aware of how the computation is done, will produce appropriately corrected %-change figures and provide appropriate titling of these so that the user knows what the results are for and that they are not derived directly from "raw" data that the user may have in a published report.

Literature Cited

Archer, B. 1994. Demand Forecasting And Estimation: In J. R. B. Ritchie and C. R. Goeldner (Eds.) *Travel, Tourism, and Hospitality Research: A Handbook for Managers and Researchers*. New York: John Wiley & Sons, Inc. P. 105-114.

Beaman, J. B.: 1985. Park Use Forecasting Procedure. The Fifth International Symposium On Forecasting, June 9-12, 1985. Montreal.

Beaman, J. B. and Smith, S. 1976. A Scheme for Decomposing Park Attendance Loading Curves and Related Analysis Methodologies. In J. Beaman (Ed.) *Canadian Outdoor Recreation*

Demand Study, Vol. 2: Technical Notes. Toronto: Ontario Research Council on Leisure. P. 504-520.

Driver, B. L., Brown, P. J., and Peterson, G. L. 1991. *Benefits Of Leisure*. State College: Venture Publishing.

Gill, P. E. , Murray, W. M.; and Wright, M. H. 1981. *Practical Optimization*. London: Academic Press.

Grimm, Sylvanna; Beaman, J. B.: 1989. Park Use Related Data Recording : A New Direction For The Canadian Parks Service. Proceedings Of The 1989 Northeastern Recreation Research Symposium, April 3-5, 1989, U.S. Department Of Agriculture, Forest Service, North-Eastern Forest Experiment Station, General Technical Report NE-132, Pp. 69-76.

Hayduk, L. A. 1987. *Structural Equation Modelling With LISREL Essentials And Advances*. Baltimore: The Johns Hopkins University Press.

Kitagawa, E. M. . 1964. Standardized comparisons in population research, *Demography* 1: 296-315.

Knudson, D.M. 1984. *Outdoor Recreation*. New York: Macmillan.

Leicester, J.B. and Beaman, J. B. 1969. The Use Of Weather Data In Recreation Planning. *Journal Of The Canadian Association For Health Physical Education And Recreation*. 35 (3).

Mannell, R. C. And Stynes, D. J. 1991. A Retrospective: Benefits Of Leisure. In B. L. Driver, P. M. Brown, and G. L. Peterson (Eds.) *Benefits Of Leisure*. State College: Venture Publishing.

Stanley R. 1991; Beaman, J. B.; Counting Visitors At National Parks : Concepts And Issues. Proceedings Of 1991 Northeastern Recreation Research Symposium. U. S. D. A. Forest Service General Technical Report NE-160. April 7-9, 1991 Saratoga Springs, New York.

Theobald, W. F. 1979. *Evaluation Of Recreation And Park Programs*. NY. John Wiley & Sons.

Thomson E.; Beaman, J. B.; Cotter M. 1990. Effective Management Of Parks And Recreation Information. Proceedings Of The 1990 Northeastern Recreation Research Symposium, February 25-28, 1990, U.S. Department Of Agriculture, Forest Service, Northeastern Forest Experiment Station, General Technical Report NE-145. Pp. 103-110.

Vaske, J.; Beaman, J.; Stanley, R.; Grenier, M. 1995. P-I And Segmentation: Where Do We Go From Here?. *Journal Or Tourism And Marketing Research or Recent Advances in Tourism Marketing Research* (Fesenmaier, O'Leary and, Eds., NY: The Haworth Press)

Zinsler, C. I. 1995. *Outdoor Recreation: United States Parks, Forests and Public Lands*. New York: Wiley.

**AN ANALYSIS OF VEHICLE ACCIDENTS
INVOLVING WHITE TAILED DEER: A
GEOGRAPHIC INFORMATION SYSTEMS CASE
STUDY**

Christopher A. Mueller

Park Ranger, Newport News Park Department, 11523 Jefferson
Avenue, Newport News, VA 23606

David L. Wall

Assistant Professor of Government and Public Affairs,
Christopher Newport University, 50 Shoe Lane, Newport News,
VA 23606

Stuart P. Cottrell

Assistant Professor of Leisure Studies, Christopher Newport
University, 50 Shoe Lane, Newport News, VA 23606

Abstract: This paper is an analysis of vehicle accidents involving the Virginia white-tailed deer (*Odocoileus virginianus*) in the city of Newport News, Virginia over three years using a personal computer based Geographic Information Systems (GIS). The study was a pilot project to identify capabilities of a PC based vector GIS software in an educational and management setting. GIS capabilities were used to create a map of accidents per mile to specifically identify the most dangerous stretches of roadway. The maps were used to make decisions on implementation of resource management actions to prevent and reduce the numbers of future incidents resulting in property damage and death of members of the species.

Introduction

Resource management presents a number of unique and difficult challenges, especially for those parks located in largely urban environments. One means to deal with these complex relationships is via computer technology through the use of geographic information systems (GIS). GIS allows resource manager(s) to collect a wide variety of data on both the natural and human environment to use as alternative sources of information to enhance planning and land use management decisions. As a management tool, GIS provides the resource manager with visual and analytical abilities, combined with archival data storage access and retrieval methods to create visual maps of the land area in question: thus, showing the unique characteristics of the land (Burrough 1992, Huxhold 1991, Powers 1994, Star and Estes 1990).

Historically, maps have been used for navigation to and through unfamiliar terrain. This concept can be applied in today's information driven society to help park and recreation administrators navigate their way through an ocean of data (Wicks, Backman, Allen, and Blaricom, 1993). The purpose of this paper is to demonstrate the useful application of GIS in

decision making as it pertains to safety of park patrons and wildlife resources.

Case Study in Newport News, Virginia

This study was undertaken as a pilot project to evaluate the usefulness of a moderately priced PC based GIS software in an urban-resource management environment. Within the legal boundaries of the city of Newport News, Virginia, are a number of traditional urban green space parks (e.g., predominately grassy areas), as well as several parks maintained in a more natural environment (i.e., predominantly wooded areas with a mix of hardwood and evergreen native species). It is those parks preserved in a more natural environment that present a more interesting challenge to resource managers. These more natural environments require some of the same management techniques, including GIS, as those areas generally considered more wilderness like in nature (Friel and Haddad 1992; Bruce 1992). Of concern for this study is the relatively large population of Virginia white-tailed deer (*Odocoileus virginianus*) supported in these parks. With areas surrounding these parks being urban in nature, consisting of residential subdivisions, high-speed highways, and low density industrial parks, the interactions between humans and deer present safety concerns for the resource manager. This type of problem, traffic management and resource management, is one faced by a number of US National Parks (Spear and Cottrill 1993).

This study was initiated by one of the co-authors while enrolled in a GIS course at Christopher Newport University. In that course each student had to develop and execute a GIS based analysis. The impetus for this study was a letter from the Newport News City Engineer sent to both the Director of Parks and Recreation and the Director of Waterworks, concerning the problem of traffic accidents involving deer. According to the City Engineer's letter, there were only 34 traffic accidents involving deer between October 1990 and September 1993. This number seemed low in relation to personal experiences of park rangers in Newport News who were tasked with the investigation and removal of carcasses resulting from deer/vehicle accidents. This was one reason for continued study of the issue. A reply to the City Engineer's letter from the Director of Waterworks (Mueller 1994) made excellent points concerning the difficulty of controlling the deer population. This letter inspired the investigator to use GIS to address this issue to provide information through visual analysis that might indicate methods to reduce the number of vehicle/deer accidents.

The abilities of GIS to combine different types of data (i.e., area, line, and point), seemed particularly well suited to this study. The area data necessary included location, size, type, and shape of Newport News parks. Line data includes streets, roads, and highways found within the city, while point data consisted of the locations of vehicle/deer accidents. First, it was necessary to gather data concerning deer strikes, then enter that data into a database. Next, the data was analyzed to create interpretative maps. Then, to better understand the situation and present the information in a more visual manner, site photographs and aerial photographs were incorporated.

Data Acquisition and Entry

The first step was to gather data concerning traffic accidents involving deer, more specifically termed as deer strikes. Dates and location of deer strikes were gathered from Newport News Park Department records. There were a total of 125, including the 34 discussed above, beginning February 1990 and ending December 1993. The raw data was not extremely accurate in terms of geographic information. For some of the deer strikes, exact street addresses were given. For most, only estimations of where accidents occurred, by yard and foot measurements to landmarks near their locations, were given. For example, strikes that were difficult to plot were: 1) May 25, 1990, Route 143 just North of campsite entrance; and 2) June 15, 1990, Route 105 just West of golf course entrance. In this case study, since many of the locations were not given either as a street address or with latitude and longitude, locations were estimated visually from within GIS.

Under ideal conditions, data on the location of deer strikes would be given either as an exact street address or with the exact latitude and longitude of the deer strike. If the location of the deer strike was given as an exact street address then most GIS programs can geocode that particular address. That is, given an

address the software provides an accurate estimation of the latitude and longitude of that address. That data (latitude and longitude) then becomes part of the database. Alternatively, and with the relatively low cost of hand held GPS (global positioning system), accurate estimates of longitude and latitude can be obtained. The margin of error for most hand held GPS devices provide the necessary degree of accuracy for the construction of such a database useful for this type of analysis.

Visual Analysis of Deer Strikes

After the data was entered it was visually analyzed. It was obvious, even prior to visual presentation, that the majority of the accidents would be plotted on or near park land, in particular, Newport News Park, located in the northern part of the city. This park is 8,500 acres of mostly natural vegetation. Figure 1 is a map that indicates the location of the deer strikes (gray areas are parks). While an inspection of the data prior to being mapped lead to the belief that most strikes would occur near Newport News Park, this was a function of the relatively small number of total points in this pilot database. For large databases, and in particular those where the data can be geocoded with the computer, such obvious patterns would not emerge until after the data had been put into a database and displayed with GIS.

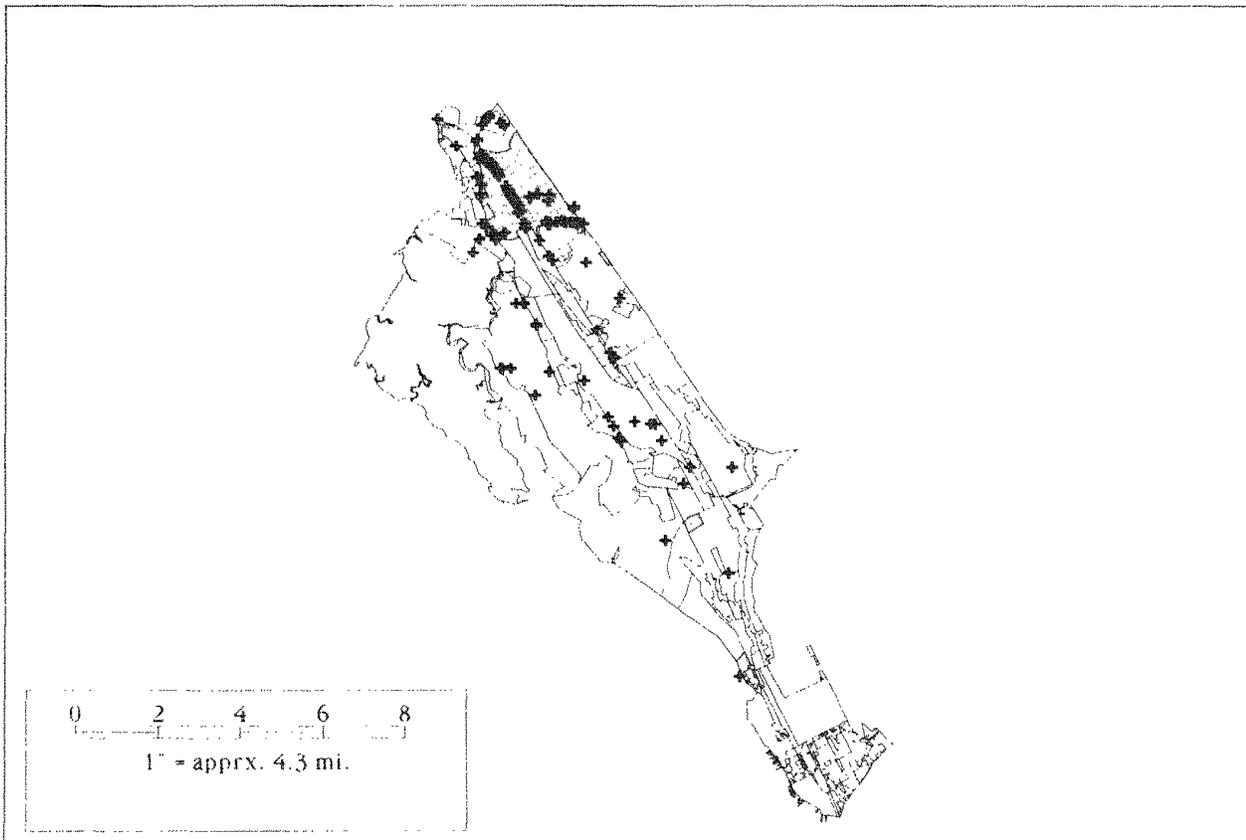


Figure 1 Deer strikes and land use in Newport News

A second map (Figure 2), Deer Strikes Per Mile, both shows those areas that are most problematic, and utilizes some of the true analytical operations of the GIS, ones that are virtually impossible to perform without a GIS. The GIS capability employed to produce this map provides the user with the ability to calculate new data values on the basis of information contained in different databases or map layers. In this case, data from the point database or layer (deer strikes), is utilized to create a new variable within the line database for streets and roads. The line database on streets and roads contains several variables on each street segment. The information can include such variables as, length of line segment, speed limit, type of road, number of lanes, etc. Utilizing the GIS we calculate a new variable, the number of deer strikes per mile. Then using the mapping capabilities of the GIS, the width of road segments are made proportional to the number of deer strikes per mile. Obviously the wider the road segment the higher the number of deer strikes per mile. As indicated, those areas that are most problematic are closest to the park areas, in particular Newport News Park in the northern part of the city. This map and the subsequent one show the concentration around Newport News Park, with Route 143 (Jefferson Avenue) and Route 105 (Fort Eustis Boulevard), both four lane, high speed roadways, being the worst in the city. In

addition, certain intersections were also revealed to be problematic.

A final map (Figure 3), is a larger-scale map in contrast to Figure 2, and focuses in on the area in and around Newport News Park.

Additional Visual Information

In order to better understand the data that was gathered and to further incorporate some of the capabilities of the particular software, GisPlus, (Caliper Corporation) additional information, in photographic form was also gathered. The additional visual data included photographs of sites and areas that had reported accidents, topographical maps, and Virginia Department of Transportation aerial photographs.

The site photographs were, simply, color photographs scanned as PCX image files. These image files were, then, linked in the database to their actual locations. The user can, upon request, view a photo image that is associated with selected locations. Most of the photos show that the areas through which the roads run are heavily wooded on one or both sides. The use of topographical maps and aerial photographs presented several

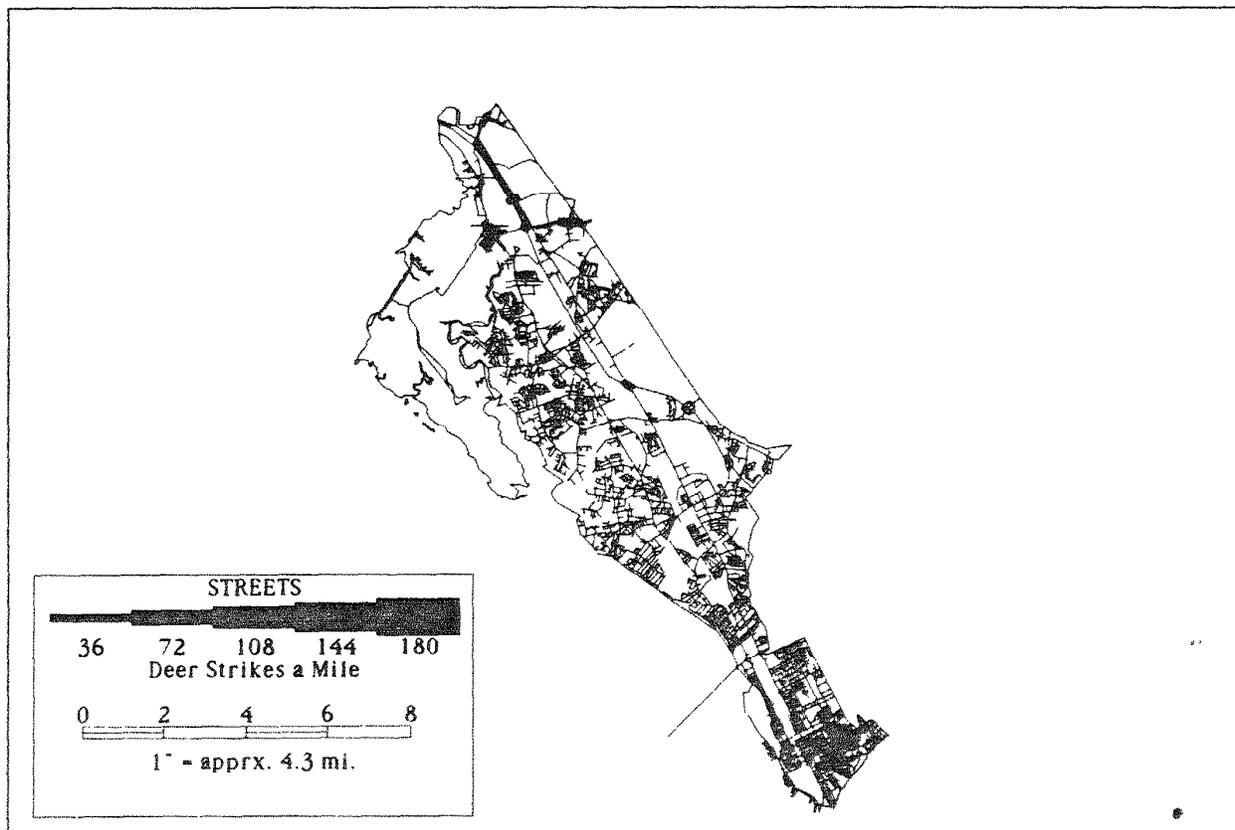


Figure 2. Deer strikes per mile: Newport News streets.

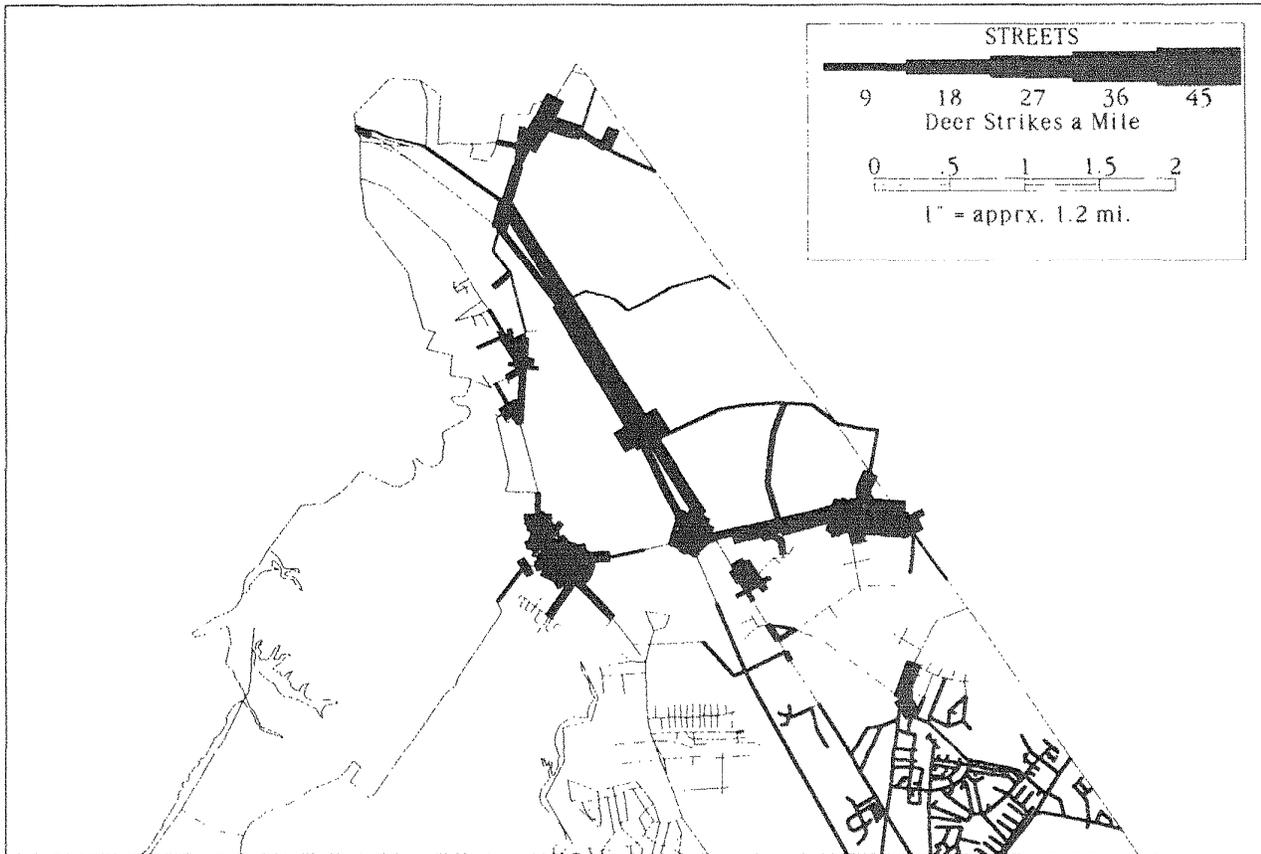


Figure 3. Concentration of deer strikes near Newport News park.

problems. The following discussion will discuss the difficulties incurred.

In addition, both topographical maps and aerial photographs were scanned as PCX image files. The GisPlus software provides for the capability of displaying these image files as background to the map. This should provide the user with the ability to visually inspect the map of the location of deer strikes (Map 1) and to display at the same time as background the aerial photograph of the area. In our particular case this was not entirely successful. Matching the aerial photographs to an existing electronic map requires matching three points from the photograph to three points in the existing map. The street map that we utilized was the 1990 U.S. Census Topologically Integrated Geographic Encoding and Referencing System (TIGER) files. TIGER files can be purchased through the U.S. Census Bureau. There are some inaccuracies in the street maps meaning that street locations are not always exact. Thus, there was a slight mis-match between any three known points on the aerial photograph and three known points on the street map. More accurate TIGER files can be purchased from third party vendors and would easily solve this

problem. A lack of funding meant this was not an option for this study.

Recommendations and Management Implications

In summary, there is a deer/vehicle accident problem in the Newport News Park area. The original information gathered by the engineering division was incomplete mentioning only 34 of 125 accidents for the period and does not give a true representation of the extent and clustering effect of deer strikes. The few GIS maps generated in this project give a good indication of where further management should be taken. From the analysis, two actions were recommended to aid in the prevention of accidents in the Newport News Park area. Because Newport News Park is an excellent habitat for the white tailed deer indigenous to the area, vehicle-deer accidents will continue in the foreseeable future. We recommend further public education to include more visual signage and lower speed limits in the most dangerous areas to increase driver reaction time. Secondly, we encourage the need for further study to include additional information about each deer strike.

Recommendations for further study are to add speed limits to the street database, and time and season to each deer strike to the point database. This would provide additional information for analysis as well as enhance the knowledge gained from that analysis. With regard to the speed limit variable, the speed limit in areas of highest concentration of accidents is generally forty-five miles an hour or greater. This information is based on observations during site visitations and not from the data available in the street database utilized in the GIS study. This would have provided further refinement of the relationship between locations of deer strikes and street conditions if the data had been available for computer manipulation.

The second variable not studied was the time of day the deer strike occurred. This data was not available at the time of the study, but it was recorded in incident reports written by members of the park service. The study that engineering completed in late 1993 showed that, of the information gathered concerning 34 accidents, 76 percent occurred after dark. If this was true for the rest of the accidents it could support a hypothesis concerning the need for better warning signs or lower speed limits in the area after dark.

The final variable not included was season of the accident. Because a male deer drops its guard during mating season while pursuing a female, a condition of sexual excitement known as rut, the hypothesis is that there is a greater occurrence of accidents during the fall mating season. This would provide consideration for increased public education during that dangerous season.

Although deer strikes are not an overwhelming problem in the city of Newport News, it is one of the many problems that park managers must deal with on a day to day basis. This pilot project demonstrates one way that GIS can be incorporated into management practices in an urban-resource management environment. The prevention of deer strikes would help the city by lowering the cost of law enforcement calls to the prevented accidents, decrease damage to personal property, prevent

possible injuries, and allow for more sensible management of the deer population.

Literature Cited

- Bruce, David. 1992. GIS Helps Protect Koala Habitat. *GIS World*. 5(7):44-49.
- Burrough, P.A. 1992. *Principles of Geographical Information Systems for Land Resources Assessment*. New York: Oxford University Press.
- Friel, Chris; Haddad, Ken. 1992. GIS Brings New Outlook to Florida Keys Marine Resources Management. *GIS World*. 5(9):32-36.
- Huxhold, William. 1991. *An Introduction to Urban Geographic Information Systems*. New York: Oxford University Press.
- Mueller, Frederick W. 1994. *Traffic Accidents Involving Deer*. Management memo, City of Newport News, VA, Public Utilities (Waterworks).
- Powers, Aleta. 1994. GIS Efforts Target Long-Term Resource Monitoring. *GIS World*. 7(5):37-39.
- Star, Jeffrey; Estes, John. 1990. *Geographic Information Systems: An Introduction*. Englewood Cliffs, New Jersey: Prentice Hall.
- Spear, Bruce; Cottrill, Bill. 1993. GIS Manages Grand Teton, Yellowstone Park Road. *GeoInfo Systems*. 3(10):52-55.
- Wicks, Bruce E.; Backman, Kenneth F.; Allen, Jeffrey; Blaricom, Donald V. 1993. Geographic Information Systems (GIS): A Tool for Marketing, Managing, and Planning Municipal Park Systems. *Journal of Park and Recreation Administration*. 11(1):9-23.

**Festivals
and
Travel**

MOTIVATIONS FOR ATTENDING A FAMILY-CENTERED, NON-ALCOHOLIC FESTIVAL: AN EXPLORATORY STUDY OF A REGIONAL FIRST NIGHT® EVENT

Pamela H. Mower

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

Deborah L. Kerstetter

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

Abstract: The purpose of this study was to investigate the motivations of individuals attending a First Night® event and whether they differed with respect to socio-demographic characteristics. Four primary dimensions of motivations, "entertainment," "family fun," "alcohol free," and "sense of community" were uncovered. Specific age groups and income groups differed with respect to the importance they placed on two of the four dimensions. Festival managers should heed this information and use it in their program planning.

Introduction

Throughout history celebrations and festivals have offered communities the opportunity to mark special occasions through art, ritual and festivity (Uysal & Gitelson, 1994). They have the potential of strengthening a feeling of oneness and expressing the social norms and values of the community (Chacko & Schaffer, 1993). Celebrations and festivals "help people re-discover their city, learn about diverse cultures and get acquainted with old traditions..." (Earls, 1993, p. 32).

While researchers have a "sense" of the importance of festivals and special events to communities and visitors, they have continued to study their meaning. For example, in 1991 Getz provided a demographic profile of a typical festival attendee. Hebler (1988) and Holloway (1985) both hypothesized that the resurgent popularity of festivals and events was a result of changing social patterns. The vast majority of research conducted on festivals and special events, however, has dealt with the economic impacts of these functions to the host community. These studies have looked at festivals and special events in terms of their economic contribution to the local community. Only recently have researchers begun to focus on why people attend festivals and special events and what this suggests to marketers, festival managers, and host communities (c.f., Gitelson, Kerstetter & Kiernan, 1993; Lee & Kerstetter, 1995; Mohr, Backman, Gahan & Backman, 1993; Wicks & Fesenmaier, 1993). However, to the knowledge of these researchers, no research has focused on the motivations of individuals who attend

a family-centered, non-alcoholic festival, First Night®. Thus, the purpose of this study was to investigate the motivations of individuals attending the inaugural First Night® State College and whether these motivations differed with respect to socio-demographic characteristics.

The Festival

Eighteen years ago in Boston, some residents were concerned about a degenerating sense of community in their city. This was most apparent around the holidays when the people of Boston would celebrate New Year's Eve anywhere but in the city. These people, led by Zaren Earls, developed First Night®. It is the intention of First Night® celebrations to be a community/family-centered, non-alcoholic alternative to traditional New Year's Eve revelry. Earls wanted to use this celebration to "help people re-discover their city, learn about diverse cultures and get acquainted with old traditions..." (1993, p. 32). This concept has been very successful, not only in Boston, but in the 160 plus communities that also were host to First Night® events in 1995.

Methodology

Data for the study were collected from a sample of 337 individuals who visited First Night® State College between 10am and 8pm on December 31, 1994. Individuals were asked to complete an on-site interview and, if they agreed, a follow-up questionnaire at home. The follow-up questionnaire contained questions about the visitor's motivations for attending First Night® State College and also more specific questions about the respondent's demographic characteristics. A postcard was sent approximately one week after the Festival to the entire sample reminding them of the study and thanking them for their involvement. A second-follow-up questionnaire was sent to nonrespondents two weeks later. Seventy-four percent (n=251) of the sample responded.

Descriptive statistics were employed to show the frequency distribution of responses and the mean of each item. To find out whether there were specific types of motivations for attending First Night®, principal axis factor analysis with a varimax rotation was employed. The relationships between types of motivations and socio-demographic variables were determined via multiple and one-way analyses of variance.

Results

The overall factor analysis specified a four-factor solution that accounted for 57% of the variance (Table 1). Coefficient alphas for the factors were .81 or higher. Given the items that loaded on the first factor, the investigators chose to call it "Entertainment." Factor 2 was named, "Family Fun" and Factor 3 was given the title, "Alcohol Free." The final and fourth factor was titled, "Sense of Community."

The relationship between the four motivation dimensions (factors) and socio-demographic characteristics (i.e., age, education, gender, income) was tested using MANOVA and oneway analysis of variance. MANOVA revealed that there were significant differences between three of the four socio-demographic characteristics, age, education and income and the motivation dimensions. Gender was not significantly

Table 1. Results of the principal axis factor analysis of motivation statements.

	F1 Entertainment	F2 Family Fun	F3 Alcohol Free	F4 Sense of Community	Communalities
To experience the performing arts	.8872				.8533
Because I enjoy the performances	.8000				.7320
To see or hear the entertainment	.7544				.5906
I like the variety	.5038				.5120
Because the family would enjoy it		.8657			.8459
The family can do something together		.7776			.6632
To help bring the family together		.7405			.7190
It sounded like a fun thing to do		.4472			.6330
Because I expected it to be fun		.4122			.5844
Because [it] is an alcohol-free event			.8374		.8395
To support alcohol-free events			.7912		.7651
So I can show support for the community				.8067	.7655
To be a part of a community celebration				.7655	.6433
Because I am a member of this community				.7333	.6231
Eigenvalue	6.535	1.858	1.438	1.081	
% of variance	34.4%	9.8%	7.6%	5.7%	
Cumulative variance	34.4%	44.2%	51.7%	57.4%	
Standardized item alpha	.84	.86	.81	.84	

related to the dimensions. However, follow-up analyses using oneway analysis of variance with the Scheffe test as a criterion indicated that only age and income were significantly related to the motivation dimensions (Table 2).

Individuals comprising the older age group (40 years of age or older) were more inclined than the younger age group to agree that the "Entertainment," "Family Fun," and "Alcohol Free" dimensions were important reasons for choosing to attend a First Night® event. In addition, people who fell into the highest household income bracket (\$60,000+) were significantly more likely than those who reported their household incomes to be less than \$39,999 to feel that the notion of this being an alcohol free event (Factor 3) was an important reason for their attendance at First Night®.

Conclusions and Implications

The motivation dimensions found through this study partially support previous research conducted on festivals and special events. These researchers did find that people place importance on, and are motivated by, their need for entertainment and family fun at festivals. However, many individuals were also motivated by the fact that First Night® contributed to a "sense of community" and offered people an option to the traditional New Year's Eve drinking festivities.

The fact that this research uncovered two motivations previously unrecognized in the literature brings up a couple of implications. First, is the emergence of an alcohol free motivation dimension. This may lend

Table 2. Relationship between socio-demographic characteristics and motivation types using oneway analysis of variance.

Socio-demographic characteristics	F1 Entertainment	F2 Family Fun	F3 Alcohol Free	F4 Sense of Community
Age				
18-39	4.49	4.56	3.93	not sig.
40 and older	5.05	5.24	4.79	
Income				
Under \$39,999	not sig.	not sig.	4.04 ^a	not sig.
\$40-59,999			4.48	
\$60,000+			4.94 ^a	

^a/ Similar superscripts indicate significant difference at the .00 level. For example, respondents who reported earnings less than \$40,000 per year were less likely to have been motivated to attend First Night® State College for the alcohol-free environment than individuals who reported earnings greater than \$59,999 per year.

credence to recent societal campaigns against all forms of substance abuse. Many people surveyed in this study were motivated to attend First Night* because of its alcohol free aspect. This may be because we live in a very litigious society and the inherent risks of alcohol consumption are becoming too great. Secondly, these findings may suggest that there is a viable market niche for alcohol free, community and family-oriented events such as First Night*.

Festival and event professionals should note that individuals are motivated to attend events like First Night* for various reasons. They should use this information in program planning to reach the audiences attracted to their events. In addition, should they be able to promote to the various segments of their market, they would be wise to do so. They should create campaigns that would appeal, for example, to the individual who is motivated to attend the event for its "alcohol-free" nature and simultaneously promote to the individual who is coming for "family fun."

Further research needs to be conducted to determine the generalizability of the results from the State College First Night* to other First Night* communities. In the future, research should investigate whether the motivation dimensions uncovered in this study are applicable to other types of festivals and special events. It would also be interesting to try to learn why individuals are motivated to attend these types of events for the reasons stated.

Literature Cited

- Backman, K., Backman, S., Uysal, M., & Sunshine, K. (1995). Event tourism: An examination of motivations and activities. *Festival Management & Event Tourism*, 3: 15-24.
- Chacko, H., & Schaffer, J. (1993). The evolution of a festival: Creole Christmas in New Orleans. *Tourism Management*, 475-482.
- Earls, Z. (1993). First Night* celebration: Building community through the arts. *Festival Management & Event Tourism*, 1: 32-33.
- Getz, D. (1989). Special events: Defining the product. *Tourism Management*, 10: 125-137.
- Gitelson, R., Kerstetter, D., Kiernan, N. (1993). Evaluating the educational objectives of the 1991 Ag Progress Days. Paper presented at The International Festival Association, San Antonio, Texas, November.
- Hebler, L. (1988). The roles of government in planning in tourism with special regard for the cultural and environmental impact of tourism. In McSwan (Ed.), *The roles of government in the development of tourism as an economic resource*, Seminar Series #1, pp. 17-23. Centre for Studies in Travel and Tourism, James Cook University, Townsville, Australia.
- Holloway, J. (1985). *The business of tourism*. London: Pittman.
- Lee, H., & Kerstetter, D. (1995). A regional arts festivals' market: Can it be segmented by residence? Paper presented at the North East Recreation Research Symposium, Saratoga Springs, New York, April.
- Mohr, K., Backman, K., Gahan, L., & Backman, S. (1993). An investigation of festival motivations and event satisfaction by visitor type. *Festival Management & Event Tourism*, 1: 89-97.
- Uysal, M., & Gitelson, R. (1994). Assessment of economic impacts: Festivals and special events. *Festival Management & Event Tourism*, 2: 3-9.
- Wicks, B., & Fesenmaier, D. (1993). A comparison of visitor and vendor perceptions of service quality at a special event. *Festival Management & Event Tourism*, 1: 16-19.

CROWDING AT AN ART FESTIVAL: A REPLICATION AND EXTENSION OF THE OUTDOOR RECREATION CROWDING MODEL

Hoon Lee

Graduate Student, Leisure Studies, School of Hotel, Restaurant
and Recreation Management, Penn State University, University
Park, PA 16802

Deborah Kerstetter

Assistant Professor, Leisure Studies, School of Hotel, Restaurant
and Recreation Management, Penn State University, University
Park, PA 16802

Alan R. Graefe,

Associate Professor, Leisure Studies, School of Hotel, Restaurant
and Recreation Management, Penn State University, University
Park, PA 16802

John J. Confer, Jr.

Instructor, Leisure Studies, School of Hotel, Restaurant and
Recreation Management, Penn State University, University Park,
PA 16802

Abstract: The purpose of this paper was to apply the perceived crowding model developed in backcountry settings to a festival setting. Festival participants in an urban area may have different characteristics from individuals exploring natural areas. Thus, the applicability of the social carrying capacity theories to defining the quality of a festival experience needs to be tested. Only three of the six independent variables were significant predictors of perceived crowding. Eleven percent of the variance in the perceived crowding measure was explained by three independent variables. However, it is worth noting that individuals who had some comparative experience felt more crowded at the festival. The expectation of crowding variable was also found to influence perceived crowding strongly. In addition, estimated density was directly related to perceived crowding. This finding supports the results of past research that has suggested a positive relationship between actual density and perceived crowding. Among the independent variables, only perceived crowding influenced overall satisfaction significantly. Individuals' perception of crowding negatively influenced their overall satisfaction.

Introduction

Festivals and special events play many important roles-- as attractions, image makers, animators of static attractions, and catalysts for other developments. Increasingly, they are also viewed as "part of the new wave of alternative tourism, which minimizes negative impacts, contributes to sustainable development, and fosters better host-guest relations" (Getz, 1991, p. 5).

To date, researchers interested in festivals and special events have predominantly focused on descriptive analyses and profiles of visitors. Thus, many individuals including contributors to the journal, *Festival Management and Event Tourism (FM&ET)*, have recommended application of different or new theories/techniques, methods, and approaches/perspectives to the festival and event tourism area.

One theory that these researchers feel has application to the festival and event management area is social carrying capacity. The concept of social carrying capacity has been linked with the notion of crowding (Stankey & McCool, 1989).

People participate in leisure and recreation activities with the expectation that their action will lead to certain rewards (Driver & Tocher, 1970; Graefe et al., 1984; Vroom, 1964). Expectancy could be defined as the belief that a certain act will be followed by a certain outcome (Schreyer & Roggenbuck, 1978). The specific expectations are influenced by personal and environmental factors such as situational variables, personality characteristics, and the type and amount of previous experience (Graefe et al., 1984; Lawler, 1973; Schreyer & Roggenbuck, 1978). Expectancy theory has several important implications for the theory of social carrying capacity. First, most people take part in leisure and recreation activities to satisfy a variety of expectations (Driver & Tocher, 1970; Graefe et al., 1984; Hendee, 1974). Second, particular expectations tend to be associated with particular activities. Nevertheless, considerable variation in expectations may be expected among individuals engaged in the same activity or using the same environment, or even within a given individual at different times (Graefe et al., 1981; 1984; Schreyer and Roggenbuck, 1978).

Expectations

Graefe et al (1984) believe that expectations influence the perception of a recreation experience. Participants of leisure and recreation may have expectations about particular aspects of their experience. The weak relationships often found between actual encounters and perceived crowding can be increased by adding expectations and preferences for encounters to the predictive model (Roggenbuck, 1992). Andereck and Becker (1993) studied perceived crowding by applying social interference and stimulus overload theories at Fort Sumter National Monument in Charleston, South Carolina. In their study, path analysis with decomposition of correlation was used to model the relationships between the independent variables of density, expectations, preferences for density, and the dependent variable of perceived crowding. The results showed expectations for density at the Fort contributed substantially and directly to perceived crowding at Fort Sumter. Shelby, Heberlein, Vaske, and Alfano (1983) explored the effects of expectations on perceived crowding in six different recreation settings. Their results showed strong and consistent support for the expectations hypothesis. In each setting, seeing more people than expected caused people to feel more crowded. However, the strength of the effect varied across settings. When individuals saw fewer or the same number of people as expected, crowding levels were extremely low (3% and 4%, respectively). When more people than expected were encountered, crowding increased to 42%.

Prior Experience

Environmental perceptions may be influenced by when the recreationist first visits a particular area (Vaske et al., 1980), or by the frequency of visitation (Bryan, 1979; Graefe, 1981; 1984). Recreation experience has been related to crowding in some studies (c.f., Ditton et al. 1983; Vaske et al. 1980), but not in others (Absher and Lee 1981; Roggenbuck, 1992; Stankey 1980; West 1981). There is some evidence to suggest that "first-time users have little or no expectations of the activity, but they then begin to evaluate future engagements against past experience" (Schreyer et al., 1976). Vaske et al. (1980) found this to be the case among boaters. The boaters who first experienced the Apostle Islands years ago when use levels were low felt much more crowded at current use levels. Heberlein and Dunwiddie (1979) observed that more experienced campers tended to choose campsites farther from other campers (in Roggenbuck, 1992). However, Vaske et al (1994) did not find the different crowding perceptions between repeat and first time visitors. Hammitt and Patterson (1991) also showed a weak relationship between past experience and coping behavior.

Situational Elements

Graefe et al. (1984) argue that geographic features of resources may reduce the number of contacts between visitors and thereby lessen the impact of use levels. Human responses, especially psychological consequences, were commonly correlated with weather matrixes (Persinger, 1980). Both Holdnak (1990) and Graefe and Fedler (1986) found situational variables, such as temperature and weather, affected respondents' overall satisfaction. Density, the actual number of visitors per unit area, has been shown by many to be related to perceived crowding. The relationship between density and satisfaction has not been well established. The so called "satisfaction model," where density predicts satisfaction, is weak at best and in many studies density was an insignificant predictor of visitor satisfaction.

Social Group and Group Size

Social groups can be categorized as the family group, friendship group, and family-friendship group. In addition, the social aggregate groups can be defined based on occupation, education, income, sex, age, marital status, size of town, ages of family members, and size of family (Field & O'Leary, 1973). Graefe et al (1984) suggested that group size can be the cue for determining the extent of perceived similarity between different user types. Differences in responses have been reported for encounters with groups of different sizes. Lime (1972) showed that most users felt seeing large parties reduced the perceived quality of the experience (in Graefe et al. 1984, p. 416).

Satisfaction

Satisfaction represents the quality of a recreation experience, and is a major goal of leisure and recreation management. "Besides investigating satisfaction derived from leisure activities, a tradition that dates back to the 1930s, researchers have explored satisfaction with marital relationships, family relationships, health care services, jobs, communities, and life in general" (Shelby & Heberlein, 1986, pp. 43-44). Overall satisfaction has been influenced most strongly and most directly by subjective evaluations of specific aspects of the experience. And, situational outcomes influence overall satisfaction in an indirect manner as

they are filtered through various subjective evaluations (Graefe & Fedler, 1986). One of the most important and thoroughly investigated relationships has been the effect of crowding on satisfaction (Williams, 1988). Stankey and McCool (1989) suggested reconsidering the utility of user satisfaction as a criterion for the measurement of capacity. Although there may be a limited relationship between use level and satisfaction, satisfaction remains a major focus of concern.

Stankey and McCool (1989) concluded several things about social carrying capacity. First, social carrying capacity is a complex phenomenon. Second, although there is a great diversity among recreationists in the kinds of use conditions, there are patterns in what is sought. Third, although people are apparently extremely versatile in their ability to cope with a wide range of use conditions and still report satisfactory experiences, it is also apparent that they have strong preferences for the kinds of experiences they seek. In a recent article, Confer et al (1995) tried to apply the satisfaction and crowding models developed for low density back country and wilderness research to a developed, high density front country setting. They found support for the models; however, the amount of variance explained was somewhat lower for their beach user study than is typically found in backcountry studies.

The rapid and widespread growth of special events is unlikely to continue unabated. According to Wicks and Fesenmaier (1993), "the rate of growth in numbers of events will diminish as demand for these recreational and tourist activities is fulfilled" (Wicks & Fesenmaier, 1993). To minimize loss of demand, Rosenow and Pulsipher (1979) suggest that tourism become more environmentally and culturally responsible and developed to increase both the quality of experience of visitors and the quality of life of residents. In addition, capacity to absorb tourism has to be considered, and limits imposed where necessary (in Getz, 1991). Thus, the purpose of this study is to apply the perceived crowding model to a festival setting and to define the quality of a festival experience.

Hypotheses

The notion of social carrying capacity is usually incorporated in outdoor recreation settings. While festival participants in an urban area may have different characteristics from individuals exploring natural areas, the social carrying capacity theory will be useful in defining the quality of a festival experience. In this study, the expectancy theory underlying the notion of social carrying capacity has been adopted to explain perceived crowding.

The hypotheses for the study are as follows:

H1: Comparative experience, prior experience, situational elements, group size, estimated density and expectations will influence perceptions of crowding at an arts festival.

H2: Perceived crowding, comparative experience, prior experience, and group size will influence overall satisfaction.

Methods

Data Collection

The Central Pennsylvania Festival of the Arts (CPFA) was created in 1967 with the primary objective of stimulating the local economy in the downtown area of State College, Pennsylvania during the summer. A random sample of individuals attending the 1995 festival was selected over a four day period. Upon completion of a one-page on-site survey, respondents were asked to complete a more extensive follow-up questionnaire. If they agreed, they were asked to write their mailing address on a form and were given a follow-up survey. A total of 969 individuals completed the on-site questionnaire. Five days after the last day of the Festival, a reminder postcard was mailed to individuals who had agreed to complete the follow-up survey. The postcard reinforced the value of the study and encouraged recipients to send in their questionnaire if they had not already done so. A second follow-up questionnaire was mailed two weeks later to individuals who had not responded. Five-hundred ninety-one individuals completed both the on-site and follow-up questionnaires, resulting in a response rate of sixty-one percent.

Path Analysis

Path analysis was developed by Wright (1925) as a method for studying the direct and indirect effects of variables taken as causes of variables taken as effects. "Path analysis is a method of decomposing structural relationships between variables in a structural equation model to distinguish that part of the relationship consisting of what the researcher believes to be the causal effect from that part that is spurious or irrelevant" (Kcane, 1994, p.160).

Path analysis has three advantages over the conventional regression technique. First, one can use the intercorrelations to obtain better estimates of the effects of other variables on the dependent variable, by forcing the researcher to specify a model of the interrelationships between the explanatory variables. Second, it has the opportunity to assess which variables in the model have the strongest causal relationship with the dependent variable. Third, one can model the specific ways in which this causal relationship is brought about and assess the relative strengths of each (Breen, 1983; in Kcane, 1994).

Path Model

To determine peoples' perception of crowding (X7), six exogenous variables (X1 to X6) were introduced into the model. Three exogenous variables (X1, X2, X6) and the perceived crowding variable (X7) were introduced to determine the impact on overall satisfaction (X8) (See Figure 1).

Variables used in the analyses were classified into two categories. First, exogenous variables were variables whose variability was assumed to be determined by causes outside the causal model. Comparative experience, whether or not individuals have visited a nearby, less crowded festival was the first exogenous variable. First visit/repeated visit and expectation of crowding comprised the second and third exogenous variables. Respondents were asked if the number of people encountered was more than, less than, or about the same as they expected. Estimated density was the fourth exogenous variable. The fifth exogenous variable, hourly temperature record, was obtained from the local airport, University park airport. Lastly, group size was included.

Endogenous variables, whose variation is explained by exogenous or endogenous variables in the system, included perceived crowding and overall satisfaction. This study used five Likert type questions for perceived crowding with "not at all crowded" and "extremely crowded" as the end points to measure perceived crowding. Overall satisfaction was measured on a seven-point scale with 1="low" and 7="high"

Results

Among the Festival participants, above one third had visited a nearby, less crowded festival (yes="33.2%," no="66.8%"). About 80% of the participants also had attended this festival before (yes="83.0", no="17.0"). In the expectation of crowding, 53.9 % of participants answered "as many as I expected." Only 9.6 % of participants had met more other visitors than they expected. During the four-day festival, about fourteen thousand people took part in the Festival per day. Average temperature and group size were about 87° and three people respectively. The Festival participants' feeling of crowding was below "moderately crowded" (mean score="2.17"). In addition, their overall satisfaction was fairly high (mean score="5.45") (See Table 1).

Table 1. Descriptive analysis results for variables included in the path models.

Variable Name	%	
Comparative Experience (X1) ^a	33%	
Prior Experience (X2) ^a	83%	
Expectation of Crowding (X3) ^b	10%	
Variable Name	Mean	Std. Dev.
Estimated Density (X4) ^c	14200	5190
Temperature (X5) ^d	87°	5°
Group Size (X6) ^e	3.1	2
Perceived Crowding (X7) ^f	2.2	0.9
Overall Satisfaction (X8) ^g	5.4	1

a/ Percentage of respondents answering yes.

b/ Percentage of respondents indicating they saw more people than expected.

c/ Total daily estimated attendance

d/ Average daily air temperature in degrees Fahrenheit

e/ Average size of group in number of people

f/ Measured on a 5-point Likert scale where 1="not at all crowded to 5="extremely crowded

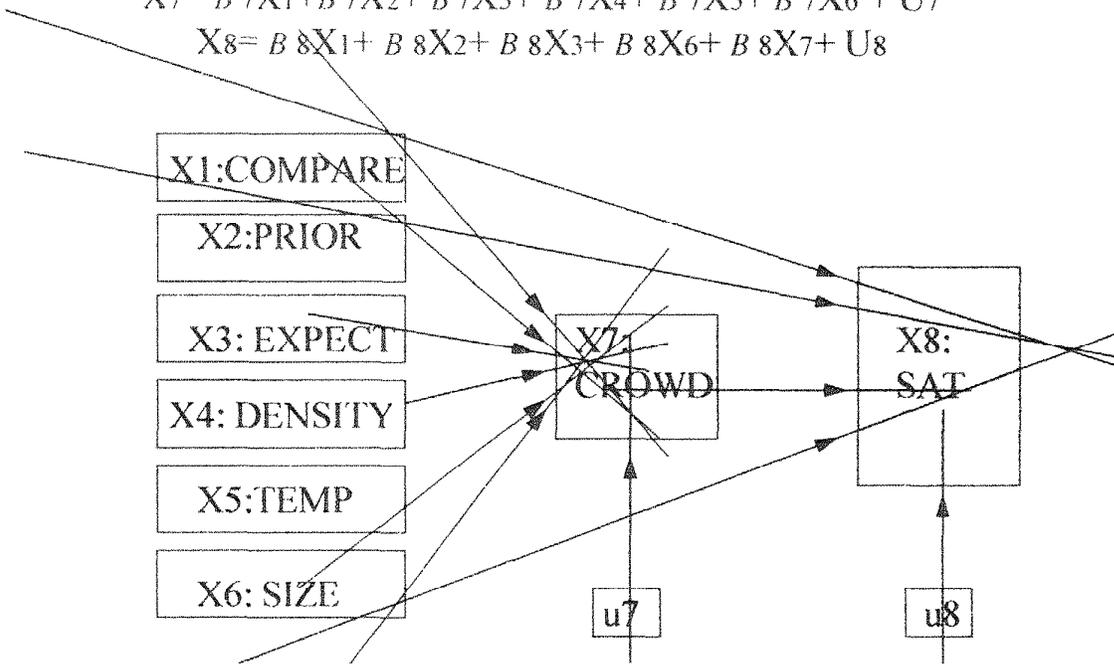
g/ Measured on a 7-point Likert scale where 1="low to 7="high

With respect to the first hypothesis (H1), only three of the six independent variables (X1, X3, and X4) were significantly related to perceived crowding (X7). Eleven percent of the variance in perceived crowding was explained by the three independent variables. The temperature was a not significant predictor. Perhaps the four days of the festival were not enough to get the wide range of temperature change. Prior experience and group size were also not significant in this festival setting.

The percent of variance explained is less than has typically been reported through research in outdoor recreation settings (Heberlein, et al. 1979; Vaske, et al. 1982). However, it is worth noting that individuals who had some comparative experience

$$X7 = B7X1 + B7X2 + B7X3 + B7X4 + B7X5 + B7X6 + U7$$

$$X8 = B8X1 + B8X2 + B8X3 + B8X6 + B8X7 + U8$$



Where:

- X1: Comparative Experience
- X2: Prior Experience
- X3: Expectation of Crowding
- X4: Estimated Density
- X5: Situational elements
- X6: Group Size
- X7: Perceived Crowding
- X8: Overall Satisfaction
- U7, U8: error term

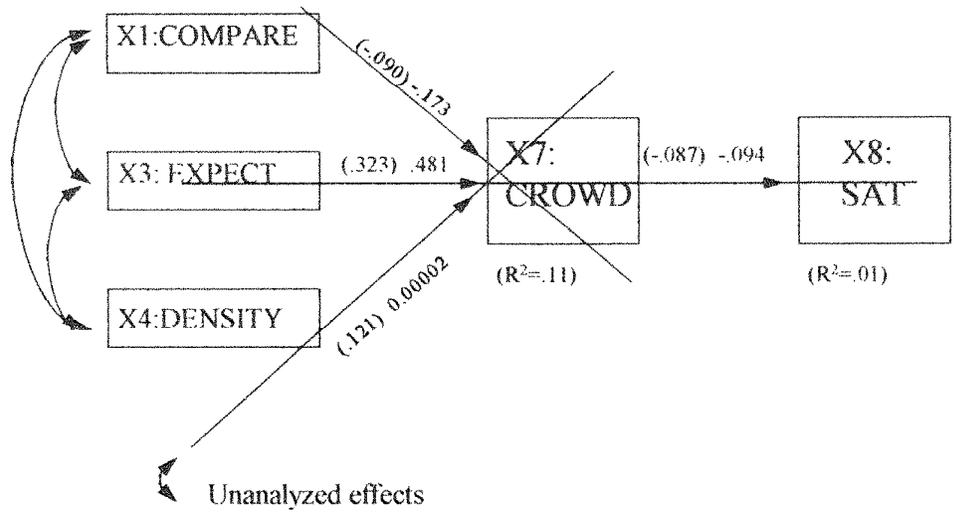
Figure 1: The Initial Path Model

(X1) felt more crowded at the Festival. The expectation of crowding (X3) was also found to influence perceived crowding strongly. For example, when visitors saw more people than they expected, they felt more crowded at the Festival. This result could be explained by the expectancy theory. In addition, estimated density (X4) was related to perceived crowding (X7). This finding supports the results of past research that suggested a positive relationship between actual density and perceived crowding (c.f. Absher, 1980; Absher and Lee, 1981; Ditton et al., 1982; Graefe, et al., 1984; Hammitt et al., 1982; Heberlein and Baumaartner, 1978; Heberlein et al., 1982; Heberlein and Vaske, 1977; Lee, 1975; Randall, 1977; Shelby, 1976, 1980; Shelby and Covin, 1979).

Among the independent variables, only perceived crowding (X7) influenced overall satisfaction (X8) significantly. Individuals' perception of crowding negatively influenced their overall satisfaction ($R^2 = .008$). The aim of path analysis is to decompose

the zero order correlation between two such variables into components due to these various effects. The basic theorem of path analysis can be stated as $r_{ij} = \sum p_{ik} \cdot r_{jk}$, where k is an index referencing those variables having a direct impact on X_j and the subscript i referencing the dependent variable in the pair (Keane, 1994). In this study's model, two types of effects, direct and indirect effects on overall satisfaction (X8) were found. (Figure 2).

The variables X1, X3, and X4 had some indirect effects on overall satisfaction (X8). However, perceived crowding, X7, was the only variable found to have a direct effect, although the overall strength of the relationship was weak. Although some correlation coefficients had a fair amount of spurious effects, X1 (.048) and X4 (.068), in the model, their path coefficients still had a significant total causal effect of 0.008 and 0.011 for X1 and X4, respectively (See Table 2).



() B's : Path coefficient, standardized coefficient
 b's : Path regression coefficient, unstandardized coefficient

$$X7 = -.090X1 + 0.323X3 + 0.121X4 \quad R^2 = .113$$

$t \quad -2.14 \quad t \quad 7.70 \quad t \quad 2.93$
 $p \quad .033 \quad p \quad .000 \quad p \quad .004$

$$X8 = -.087X7$$

$t \quad -0.94 \quad p \quad .040 \quad R^2 \quad .008$

Figure 2: Modified Model with Insignificant Paths removed

Table 2. Path analysis results: path effects on overall satisfaction (X8).

Explanatory Variable	Direct Effects	Indirect Effects	Total Causal Effect	r
X1	-	.008	.008	.048
X3	-	-.027	-.027	.047
X4	-	-.011	-.011	.068
X7	-.087	-	-.087	-.070

Conclusion

Enhancing the quality of a visitor's experience is the main purpose of festival management. Past research on outdoor recreation has shown that the quality of a visitor's experience may be influenced by his or her perception of crowding. This study was conducted to apply the theory of perceived crowding to a regional festival

Though this study was conducted within a festival setting, the explanatory variables were not much different from those found through outdoor recreation research (c.f. Graefe et. al., 1984, Stankey & McCool, 1989). Perceived crowding was influenced by individuals' expectation of crowding, estimated density, and their comparative experience. Expectation of crowding had the most significant impact on perceived crowding, supporting the theory of expectation. Heberlein (1992), and Werner and Kaminoff (1983) suggested appropriate information could reduce the density and perception of crowding in a recreation or tourism

destination. Based on the results of this study managers should not worry if photographs used in promotional channels (e.g., newspaper stories, brochures, festival guides) depict crowds because the percent of variance explained was not strong and visitors did not feel much crowding in this festival setting. However, the manager should continue to monitor visitors' responses to crowding because "comparative experience" was related to perception of crowding. As people continue to have more experience with similar/other festivals their expectations of "what is crowded" may change. In time, people may begin to perceive large numbers of other visitors at the festival as dense and as such feel crowded.

Although the relation between perceived crowding and satisfaction was significant, the direct and indirect influences were weak. This may be because there are different motivations in a festival setting such as to have fun, to do different things, and to buy art crafts. In addition, the relationship generated between perceived crowding and satisfaction suggests that an alternative model may need further attention, such as Herzberg's two-factor theory of satisfaction. Satisfaction and dissatisfaction are conceptually distinct and independent (Dorfman, 1979; McCool & Peterson, 1982; Stankey & McCool, 1989). Generalizations about perceived crowding at tourism destinations such as festivals would be inappropriate at this time; thus, it is hoped that future research will be conducted at other destinations with

different festivals and using similar methodology (e.g. path analysis, logit model, etc.).

Literature Cited

Absher, J. 1980. Sociological carrying capacity research: Communication the results. In Proceedings: Social Research in national Parks and Wildland Areas. (Gatlinburg, Tennessee: USDI nation Park Service), 78-84.

Absher, J. D. & R. G. Lee. 1981. Density as an incomplete cause of crowding in Backcountry Settings. *Leisure Sciences*. 4 (3): 231-247.

Anderock, K. L. & R. H. Becker. 1993. Perceptions of carry-over crowding in recreation environments. *Leisure Sciences* 15:25-35.

Bryan, H. 1979. Conflict in the great outdoors: Toward understanding and managing for diverse user preferences. Bureau of Public Administration, Sociological Studies No. 4. University of Alabama, Tuscaloosa.

Confer, John J., A.R. Graefe, J.M. Falk. 1995. Crowding on the beach: Examining the phenomena of over- and under-manning in alternative environments. In: Proceedings of 1995 Northeast Recreation Research Symposium April 3-5, 1989, Saratoga Spa State park, State Parks management Research Institute, Saratoga Springs, NY. Burlington, VT: USDA Forest Service: General Technical Report NE-218.

Ditton, R. B., A. J. Fedler, & A. R. Graefe. 1982. Assessing recreational satisfaction among diverse participant groups. In *Forest and River Recreation: Research Update*, pp. 134-139. University of Minnesota Agricultural Experiment Station. Miscellaneous Publication 18. St. Paul.

Ditton, R. B., A. J. Fedler, & A. R. Graefe. 1983. Factors contributing to perceptions of recreational crowding. *Leisure Sciences* 5 (4): 273-288

Dorfman, P. W. 1979. Measurement and meaning of recreation satisfaction: A case study in camping. *Environment and Behavior* 11: 483-510.

Driver, B. L., & S. R. Tocher. 1970. Toward a behavioral interpretation of recreation, with implications for planning. In *Elements of Outdoor Recreation Planning*, Ed. B. L. Driver, pp. 9-31. Ann Arbor, Michigan: The University of Michigan Press.

Field, D. R. and J. T. O'Leary. 1973. Social groups as a basis for assessing participation in selected water activities. *Journal of Leisure Research* 5 (Spring): 15-25.

Getz. 1991. *Festivals, special Events, and Tourism*. New York: Van Nostrand Reinhold.

Graefe, A. R. 1981. Understanding diverse fishing groups: the Case of drum fishermen. In *Marine Recreational Fisheries VI*, pp. 69-79. Washington, D. C., The sport Fishing Institute

Graefe, A. R., R. B. Ditton, J. W. Roggenbuck, and R. Schreyer. 1981. Notes on the stability of the factor structure of leisure meanings. *Leisure Sciences* 4(1): 51-66.

Graefe, A. R., J. J. Vaske, & F. R. Kuss. 1984. Social carrying capacity: An integration and synthesis of twenty years of research. *Leisure Sciences* 6(4): 395-431.

Graefe, A. R., & A. J. Fedler. (1986). Situational and subjective determinants of satisfaction in marine recreational fishing. *Leisure Sciences*, 8: 275-295.

Hammit, W. E., C. D. McDonald, and F. P. Noe. 1982. Use level and encounters: Important antecedents of perceived crowding among non-specialized recreationists. USDI National Park Service Southeast Regional Office and USDA Forest Service Southeastern Forest Experiment Station. Research Note. 13 pp.

Hammit, W. E., & M. E. Patterson. 1991. Coping behavior to avoid visitor encounters: Its relationship to wildland privacy. *Journal of Leisure Research*. 23 (3): 225-237.

Heberlein, T. A. 1992. Reducing hunter perception of crowding through information. *Wildl. Soc. Bull* 20(4): 372-374.

Heberlein, T. A., & P. Dunwiddie. 1979. Systematic observation of use levels, campsite selection and visitor characteristics at a High Mountain Lake. *Journal of Leisure Research*. 11 (4): 307-316.

Herberlein, T. A., & R. M. Baumgartner. 1978. Unpublished Data. Department of Rural Sociology University of Wisconsin, Madison.

Herberlein, T. A., & J. J. Vaske. 1977. Crowding and visitor conflict on the Bois Brule River. Technical Report WIS WRC 77-04. University of Wisconsin, Madison: Water Resources Center.

Herberlein, T. A., J. N. Trent, and R. M. Baumgartner. 1982. The influence of hunter density on Firearm Deer hunters' satisfaction: A field experiment. *Transactions of the 47th North American natural Resource and Wildlife Conference* 47: 665-676.

Hendee, J. C. 1974. A multiple-satisfaction approach to game management. *Wildlife Society Bulletin* 2 (3): 104-113.

Holdnak, A. 1992. The impacts of marine debris, weather conditions, and unexpected events on recreational boater satisfaction on the Delaware Inland Bays. Unpublished Dissertation. The Pennsylvania State University, University Park, PA.

Keane, M. J. 1994. Path analysis technique. *Annals of Tourism Research*. 24(1): 160-164.

Lawler, E. E. 1973. *Motivation in work organizations*. Monterey, California: Brooks/Cole.

Lee, R. G. 1975. The management of human components in the Yosemite national park ecosystem (Yosemite, California: The Yosemite institute), 134 pp.

- Lime, D. W. 1972. Large groups in the boundary waters canoe area-- their numbers, characteristics, and impact. USDA Forest Service Research Note NC-142. North Central Forest Experiment Station. St. Paul, Minnesota. 4 pp.
- McCool, S. F. and M. Peterson. 1982. An application of the two factor theory of satisfaction to recreational settings. Report submitted to Forestry Sciences Laboratory, Intermountain Forest and Range Experiment Station, Missoula, MT.
- Persinger, M. A. 1980. *The Weather Matrix and Human Behavior*. New York: Praeger.
- Randall, J. 1977. The windshield experience: Visitor density, perceived crowding and satisfaction in a drive-through Dunes Park. M.S. Thesis. University of Wisconsin, Madison
- Roggenbuck, J. W. 1992. Use of persuasion to reduce resource impacts and visitor conflicts. In *Influencing Human Behavior: Theory and Applications in Recreation, Tourism, and Natural Resources Management*, ed. Manfredi, M. J. Champaign, Illinois: Sagamore Publishing Inc., 149-208.
- Shelby, B. 1976. Social psychological effects of crowding in wilderness: The case of river trips in the Grand Canyon. Ph.D. Dissertation. Colorado State University, Ft. Collins
- Shelby, B. 1980. Crowding models for backcountry recreation. *Land Economics*, 56(1): 43-55.
- Shelby, B., & R. B. Colvin. 1979. Determining use levels for the Fogue River. Water Resources Research Institute. WRR1-63. Oregon State University, Corvallis.
- Shelby, B., & T. A. Heberlein. 1986. *Carrying capacity in recreation Settings*. Corvallis, OR: Oregon state University Press.
- Shelby, B., T. A. Heberlein, J. J. Vaske, & G. Alfano. 1983. Expectations, preferences, and feeling crowded in recreation activities. *Leisure Sciences*, 6 (1): 1-13.
- Shreyer, R., & J. W. Roggenbuck. 1978. The influence of experience expectations on crowding perceptions and social-psychological carrying capacities. *Leisure Sciences* 1 (4): 373-394.
- Schreyer, R., J. W. Roggenbuck., S. R. McCool, L. E. Royer, & J. Miller. 1976. *The Dinosaur National Monument Whitewater Recreation Study*. Logan, UT: Utah State University 165 p.
- Stankey, G. H. 1980. A comparison of carrying capacity perceptions among visitors to two wildernesses. Res. Paper INT-242. Ogden, UT. U. S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. p. 34.
- Stankey, G. H. & S. F. McCool. 1989. Beyond social carrying capacity, in *Understanding Leisure and Recreation*, Ed Jackson, E. L. & T. L. Burton. State College, PA: Venture Publishing, Inc.
- Vaske, J. J., A. R. Graefe, & A. B. Dempster. 1982. Social and environmental influences on perceived crowding. In *Proceedings: Wilderness Psychology Group Conference*, ed. F. E. Botcler. 211-227. Morgantown, WV: West Virginia University.
- Vaske, J. J., M. P. Donnelly, & T. A. Heberlein. 1980. Perceptions of crowding and resource quality by early and more recent visitors. *Leisure Sciences* 3 (4): 367-381.
- Vaske, J. J., M. P. Donnelly, R. M. Doctor, and J. P. Petruzzi. (1994). *Social carrying capacity at the Columbia Icefield: Applying the visitor impact management framework*. Department of natural Resource Recreation and Tourism , Human Dimensions in Natural Resources Unit, Colorado State University. Fort Collins: Co. HDNR Unit Report 11.
- Vroom, V. H. 1964. *Work and Motivation*. N. Y.: John Wiley and Sons.
- West, P. C. 1981. Perceived crowding and attitudes toward limiting use in backcountry recreation areas. *Leisure Sciences*, 4 (4): 419-426
- Wicks, B. E., & D. R. Fesenmaier. 1993. A Comparison of visitor and vendor perceptions of service quality at a special event. *Festival management & Event Tourism*, 1(1): 19-26.
- Williams, D. R. 1988. Great expectations and the limits to satisfaction: A Review of recreation and consumer satisfaction research. In *Proceedings, Benchmark 1988: A national Outdoor and Wilderness Forum*. Nashville, NC: USDA Forest Service, Southeastern Forest Experiment Station.
- Werner, R. E., & Kaminoff, R. D. 1983. Improving Environmental Information: Effects of signs on perceived crowding and behavior. *Environ and Behav*, 15: 3-20.
- Wright, S. 1925. *Corn and Hog Correlations*. Washington: US Department of Agriculture.

THE ECONOMIC IMPACT OF CONFERENCES AND CONVENTIONS

Stephen C. Grado

Assistant Professor, College of Forest Resources, Box 9681,
Mississippi State University, Mississippi State, MS 39762-9681

Charles H. Strauss

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

Bruce E. Lord

Senior Research Assistant, School of Forest Resources, The
Pennsylvania State University, 206 Ferguson Building,
University Park, PA 16802

Abstract: A 1993 study in southwestern Pennsylvania, based upon 25 travel-related activities, was used to determine the economic impact of travel and tourism. Expenditures from conferences and conventions were included in a business and transient travel activity. A 1994 study established conferences and conventions as a separate travel activity. Annual visitation totaled 970,051 for the activity. Nonresident visitors spent an average of \$134.20 per activity day. The value-added component of the economic impact totaled \$98.4 million and 4,188 jobs were supported.

Introduction

In recent years the conference and convention trade has been expanding at a rapid rate (Listokin 1985; Braun 1992). Many communities and states have planned strategies to attract more of these events to their areas. Not only is the conference and convention activity considered an economic windfall for these communities but it is also viewed as a mechanism to accelerate the overall travel and tourism trade further (Rutherford and Kreck 1993). The result is more business for those commercial and industrial sectors capable of absorbing conference and convention delegate spending (Braun 1992). One way of evaluating the contribution of these events to an area is to assess the economic impact of this activity.

A 1993 study of travel and tourism in southwestern Pennsylvania was based upon 25 travel-related activities. The study was used to determine the economic impact of travel and tourism in a nine-county region of southwestern Pennsylvania (Strauss, Lord, and Grado 1994). The region consisted of Bedford, Blair, Cambria, Fayette, Fulton, Huntingdon, Indiana, Somerset, and Westmoreland counties. Participants in these activities included visitors to tourist and recreational sites and events throughout the region, and also business and transient travelers. Visitor expenditure profiles, total expenditures, and nonresident expenditures were identified for each activity. The expenditure profiles included entrance fees, lodging, transportation, food, and related trip purchases such as souvenirs. Initially, in 1993, expenditures from conferences and conventions were included in

the business and transient travel activity. In a 1994 repeat of the overall study, conferences and conventions were established as a separate travel activity to evaluate their economic contribution to the region's travel and tourism trade.

Objectives

All of the study objectives were directed toward the conference and convention trade in the nine-county region. The first objective was to identify the major conference and convention facilities for each county. The second objective sought to identify and define the types of conferences and conventions attended by visitors and vendors. The third objective was to determine the attendance for the activity. The fourth objective was to establish conference attendee residence and their trip-related expenditures within the nine-county region. The final objective was to use the survey data to determine the economic impact of conferences and conventions.

Procedures

A sequence of procedures was used to achieve each of the above objectives. First, a list of conference facilities was compiled from various sources including brochures, tourism publications, and research publications on southwestern Pennsylvania. Additionally, the area's travel promotion agencies were consulted. As a result there was a total of 37 host facilities in 8 of the 9 counties of the region. During this process it was decided to categorize the hosts into three facility types; hotels/motels, colleges/universities, and resorts.

Conferences and conventions were categorized by this study into four main types: 1) Business/Professional, 2) Academic, 3) Heritage-Related, and 4) Special Interest. These categories were identified because they describe individuals and the primary activities taking place at each event. Business/Professional conferences are those events attended by business executives or professionals organized to recognize achievements, share ideas, learn more about the workplace, and meet fellow professionals. Academic conferences are attended to gain or share further knowledge about a particular educational subject. These conferences are generally held on college campuses. Heritage-Related conferences are attended to gain further knowledge about the culture or history of a particular time, event, or heritage-related attraction. Additionally, many heritage-related groups hold their monthly or annual meetings in the region. Special Interest conferences include all events not previously defined by the above categories.

Each facility offering conferences and conventions was then contacted by telephone to establish a contact person (e.g., conference coordinator) and confirm a mailing address. During the telephone interview, a list of the number of conference rooms and the visitor capacity per room was established for each facility throughout the region. Also, the number of operating days per year for each host facility was established. From this information the total potential conference capacity in visitor days per year for the facility could be determined. This potential capacity was identified by this study as the facility capacity.

Next a survey form with a list of instructions and a cover letter was developed and mailed to the conference coordinator at each facility to gather data on actual conferences and conventions

hosted during 1994. The conference coordinator was asked to provide (for each conference type) the average daily attendance and the length in days of each event. In many incidences this information was not known or the coordinator felt they could not reveal the information. As an alternative, the conference administrator could provide the name and phone number of a conference organizer so that attendance could be more directly acquired by our staff. Once collected, this data was used to calculate the actual attendance in visitor days for conferences and conventions at each facility.

A sequence of tasks was followed to determine the total number of visitor days by attendees in the region. The visitor days for each conference event were calculated by multiplying the average daily attendance times the length of the conference in days. For all facilities responding to the survey, total attendance was the summation of the visitor days from the individual events. A summation of known visitor days divided by the facility capacity equaled the capacity utilization for respondents. Estimates were then made for nonrespondents. Capacity utilization of facilities responding to the survey could be used to estimate visitor days of nonrespondent facilities. Estimates were developed for each conference facility type: hotels/motels, colleges/universities, and resorts. Visitor days for all conference facilities were then totaled. A listing of the regional visitor days for conferences by conference facility type can be located in Table 1.

Interviews of the public were also conducted at host facilities for each conference type to identify the residence, travel itinerary, and trip-related expenditure profiles of conference attendees. On-site expenditures and regional expenditures included registration fees, lodging, food, transportation, and other trip related purchases (e.g., exhibit costs, souvenirs).

Economic Impact

Expenditures by residents did not represent an influx of new money to the region and were excluded from the impact analysis. Nonresident expenditures, identified by type of purchase during the interview process, were further classified by the industrial sector producing the good or service. This reorientation facilitated data entry into the Impact Analysis for Planning (IMPLAN) model. IMPLAN is a computerized data base and modeling system for constructing regional economic accounts and regional input-output tables. An input-output analysis assesses the change in the overall economy that results from a corresponding change in some activity (e.g., conference

and convention activities). The model relies on two sets of data. The first is a 528 sector input-output transaction table based upon the Bureau of Economic Analysis' National Input-Output table (USDC 1984). This describes the utilization and production of commodities by 528 manufacturing, commercial, and government sectors in the United States economy. The second is the county-level data to be used for developing a regional input-output structure that describes total output, employment, and the components of final demand and value-added for the sectors within the region.

The IMPLAN model of the region was then used to derive the direct and secondary (indirect and induced) impacts resulting from these conference and convention expenditures. The combination of direct, indirect, and induced impacts were measured as the total value of goods and services produced regionally, value-added to the regional economy, and annual employment.

Direct sales represent the portion of regional expenditures by nonresident that are retained by regional businesses. These sales are final demands on the regional industries producing the good but do not include the value of the good produced outside the region. Direct sales were further analyzed by IMPLAN for their secondary impacts. Indirect sale impacts result when regional businesses sell their products. These businesses then turn around and purchase inputs such as labor and materials from other sectors of the regional economy (Johnson and Moore 1993). The induced sales impacts occur from household consumption generated by the employment tied to direct and indirect sales. An example would be the contributions to the regional economy from the wages spent by hotel and lodging employees. Value-added represents that portion of the total sales impact directed to employment income, capital use, taxes, and profit.

Results

Facility and Visitor Surveys

Survey forms were sent out to 37 conference facilities in the region. The survey forms were followed up by a telephone inquiry for those not responding. Ultimately,

Table 1. Conference/Convention frequency and attendance estimates by type

Conference/Convention Type	Number Of Events	Average Event Days	Annual Visitor Days	Visitor Day Distribution
Business/Professional	1708	2.89	693,861	71.5%
Academic	342	2.78	52,893	5.5%
Heritage Related	104	1.91	9,210	0.9%
Special Interest	573	2.82	214,087	22.1%
Total	2727		970,051	100.0%

a 41% return was achieved from this procedure. There were returns from 3 of 7 resorts, 5 of 7 colleges/universities, and 7 of 23 hotels/motels.

A total of 132 on-site visitor surveys were completed during ongoing conferences. These interviews were undertaken at hotel/motel, college/university, and resort settings covering all four conference types

In the region there were 2,727 conferences in total. The average length was 2.82 days (Table 1). Business/Professional events dominated the activity (71.5%), followed by the Special Interest category (22.1%). A total of 61.1% of the events were held at resorts, 33.4% at hotels/motels, and 5.5% at colleges/universities.

Residence and Visitor Days

The conference facilities responding to the survey represented 59% of the estimated annual visitor days. The total number of visitor days in the nine-county region for conferences totaled 970,051 (Table 1). Of these, 8,295 visitor days were attributed to vendors. Participant visitor days totaled 961,756. Most visitors coming to the area for conferences were from outside the region. The out-of-region attendance to regional conferences by participants was 655,642 visitor days (68.2%). A total of 306,114 attendees lived in the region (31.8%). Among all participants, 22% visited other recreational sites on the day of the on-site interview.

Visitor Trip-Related Expenditures

Average expenditures for conference and convention participants were identified on a visitor day basis. All visitors averaged \$114.53 per activity day with nonresidents spending 85% more than residents. Most of the difference can be attributed to lodging expenses and additional meals at the lodging facility. Table 2 provides the total expenditures by type in the region for resident and nonresident attendees during the conference.

Most trip expenditures by all visitors were spent at the host facility on food, lodging, souvenirs, parking fees, and conference registration fees. For nonresidents 76.9% of the on-site expenses were spent on lodging, food, and fees. Souvenirs and vendor purchases were 23.1% of the total

on-site expenses. Conference attendees also spent additional money in the region while their conference was in session. Among off-site expenditures the next highest totals for all visitors were attributed to goods and services (e.g., shopping), food (e.g., restaurants and groceries) and transportation costs. Overall, lodging expenses were incurred primarily at the hotel/motel, college/university, or resort at which the conference was located. For residents there were no off-site lodging expenses. This category was minimal for nonresidents as well.

Economic Impact

Regional expenditures made by nonresident visitors to conferences and conventions resulted in total sales impacts of \$163.3 million among regional businesses (Table 3). The direct sales accounted for 33.3% of this activity, with secondary impacts representing the remaining 66.7%. The value-added component of total sales provided \$98.4 million to the local economy. Employee income constituted \$57.3 million of this regional benefit and was distributed more than 4,188 full and part-time jobs.

The regional economic impacts were summarized by industry groups (e.g., Mining) (Table 3). Each industry group in the table represents an aggregation of industrial sectors in the regional economy. For example, Mining represents those businesses providing ores, sand, stone, and gravel. Services include the Hotel and Lodging Places and the Automobile Repair and Services sectors. Government includes federal, state, and local enterprises.

The Services group was the main beneficiary of conference activity with a value-added to the economy of \$44.5 million. The Finance, Insurance, and Real Estate group and the Wholesale and Retail Trade Group were the next two largest recipients, with value-added of \$18.8 million and \$17.7 million, respectively. The total sales impact realized by the Finance, Insurance, and Real Estate group (\$26.7 million) was exclusively from secondary sources. The Services group had the next highest secondary sales impact at \$25.9 million. This impact represented business and household demands for financial services and household investment in personal real estate. Jobs were found primarily in the Services group (63.0%) and the Wholesale and Retail Trade group (23.2%).

Table 2. Total expenditures of vendors and visitors by residence and type of purchase.

Residence	Resident	Resident	Nonresident	Nonresident
Expenditure Type	\$	%	\$	%
On-site	17,901,270	80.2	79,887,574	89.8
Transportation	920,554	4.1	2,228,617	2.5
Lodging (off-site)	0	0.0	93,796	0.1
Food	1,207,077	5.4	2,522,111	2.8
Goods and Services	2,288,461	10.3	4,186,315	4.7
Total	22,317,362	100.0	88,918,413	100.0

Table 3. Total regional economic impacts of visitors to conferences and conventions.

Industry	Direct Sales	Secondary Sales	Total Sales	Value-Added	Employee Income	Jobs #
Agriculture, Forestry, Fisheries	\$9,600	\$1,791,000	\$1,800,600	\$587,000	\$235,500	33.76
Mining	\$40,500	\$514,700	\$555,200	\$420,600	\$133,300	3.57
Construction	\$0	\$4,618,500	\$4,618,500	\$2,719,200	\$2,053,000	98.92
Manufacturing	\$35,200	\$12,247,100	\$12,282,300	\$4,469,700	\$2,842,100	132.89
Transportation, Commun., Utilities	\$179,200	\$13,389,800	\$13,569,000	\$7,420,100	\$2,895,800	100.19
Wholesale and Retail Trade	\$4,469,800	\$20,525,400	\$24,995,200	\$17,691,900	\$11,590,700	970.98
Finance, Insurance, Real Estate	\$0	\$26,737,800	\$26,737,800	\$18,812,700	\$3,053,500	170.50
Services	\$49,613,900	\$25,920,700	\$75,534,600	\$44,512,600	\$33,182,100	2,637.72
Government Enterprises	\$99,200	\$3,131,300	\$3,230,500	\$1,797,600	\$1,337,000	39.55
Total	\$54,447,400	\$108,876,300	\$163,323,700	\$98,431,300	\$57,323,000	4,188.08

The ratio of the total sales impact to direct sales impact is called the Type II multiplier. This multiplier identifies the strength of the regional economy in providing indirect linkages within the business community and in meeting the induced demands of those people employed by the direct and indirect sectors. For the conference and convention activity the multiplier was 3.0.

Conclusions

Most of the conference and convention attendees were nonresidents. This infusion led to a substantial influx of money into the region as they spent an average of \$134.20 per activity day. When nonresidents spend money, it creates an economic impact within lodging facilities, restaurants, gas stations, and for other local merchants. The total sales impact was \$163.3 million creating a value-added of \$98.4 million. The key beneficiaries of the activity were the Service sectors, the Wholesale and Retail Trade sectors, and the Financial, Insurance and Real Estate sectors. The Services group includes Hotel and Lodging Places that delivered most of the value-added (\$44.5 million) to the region.

Often the indirect sale impacts overshadowed the direct sale impacts for a particular sector grouping (e.g., Manufacturing). Direct sales in the Hotel and Lodging Places sector require utilizing inputs from other sectors in their production systems. Inputs that are regionally produced generate additional indirect economic impacts. Therefore, there was a larger indirect impact in the Manufacturing group. Local businesses produce items consumed during the conference and convention trade (e.g., pencils, paper products, etc.) that need to be produced and supplied to the lodging industry.

The expenditures tied to the conference and convention activity also supported 4,188 full and part-time jobs. This was a result of both direct and indirect sales within the region. The economic impact in the region also reflects the spending of salaries by this employment base on regional products and services. For example, both the Hotel and Lodging Places sector and the Eating and

Drinking Establishments sector are labor intensive. The employees in these sectors are going to spend their salaries on services in the region where they live. Illustrating this was the Financial, Insurance, and Real Estate group that received all of its impact from secondary expenditures in the region, mostly from household incomes.

There was a link between conference and convention sales and types of employment. For certain industry groups the results suggest that higher wage jobs, largely supported by secondary sales, were created in addition to the low wage jobs usually associated with travel and tourism. For example, in the Transportation, Communications, and Utilities group the average employee income per job sustained was almost \$29,000 per year.

The conference and convention activity was an important component of travel and tourism in the region. The off-site expenditures by attendees match, in many cases, the total trip-related expenditures for other tourists in the region participating in recreational activities (Strauss, Lord, and Grado 1995). A comparison was made between the 1994 conference and convention activity and the travel and recreation related activities in the 1994 impact study (Strauss, Lord, and Grado 1995). The total expenditures and total sales impacts tied to conferences and conventions were greater for this activity than for any of the other recreational activities. The only activities that measured higher were the combined activities of business and transient travel.

The Type II multiplier for conferences and conventions was 3.00. This was among the higher multipliers for all travel and tourism related activities in the region. The average ratio among all activities was 2.96 (Strauss, Lord, and Grado 1995). The higher ratios identified activities aligned with sectors that were labor intensive and used greater proportions of regional production inputs. As an example, recreational activities with higher on-site entrance fees or lodging expenses tended to have higher

Type II multipliers. Conferences and conventions certainly followed this path.

Literature Cited

Braun, B.M. 1992. The economic contribution of conventions: the case of Orlando, Florida. *Journal of Travel Research*, 31(Winter):32-37

Listokin, D. 1985. The convention trade: a competitive economic prize. *Real Estate Issues*, (Fall/Winter):43-46.

Rutherford, D.G. and L.A. Kreck. 1994. Conventions and tourism: financial add-on or myth? Report of a study in one state. *Journal of Travel & Tourism Marketing*, Vol. 3(1):49-63.

Strauss, C.H., B.E. Lord, and S.C. Grado. 1994. Economic impact of travel and tourism in Southwestern Pennsylvania during 1993. School of Forest Resources, The Pennsylvania State University, University Park, PA, May, 1994, 80 pp.

Strauss, C. H., B. E. Lord, and S. C. Grado. 1995. Economic impact of travel and tourism in Southwestern Pennsylvania during 1994. School of Forest Resources, The Pennsylvania State University, University Park, PA, 85 pp

Thunberg, E.M. and J.C. Crotts. 1994. Factors affecting travelers' overnight stay behavior. *Journal of Travel & Tourism Marketing*, 3(1):1-17.

USDC. 1984. The detailed input-output structure of the U. S. economy, 1977. The use and make of commodities by business. Vol. 1. U.S. Department of Commerce, Bureau of Economic Analysis, Washington, DC.

**Outdoor
Recreation
Values**

ADDING VALUE TO THE OUTDOOR

RECREATION EXPERIENCE

Glen D. Alexander

Chief, Ohio State Parks
1952 Belcher Drive, C-3
Columbus, OH 43224

Abstract: Ohio State Parks has focused its operational direction toward giving its customers services and experiences that extend beyond the customer's original expectations. This paper explains how the idea of added value has helped to increase fee revenues, improve customer satisfaction, and build upon our visitation and market share.

The parks and recreation business has entered a new era of fewer tax dollars available for operating facilities and programs. There is a growing trend toward "self-sufficiency" - that is covering a greater and greater percentage of operating costs with fee revenues. Most park systems are also working on ways to work "harder and smarter and do more with less" through cost-cutting programs.

Whether an organization concentrates on just cutting costs, or ventures into the revenue generation realm, it needs to keep the compass point concept of "adding value to the outdoor recreation experience" ever before it. We define adding value as: the **surplus or deficit of perceived value** the customer receives from any service modification over the value he tenders for it. The concept of added value applies to services that are free and those one pays for.

Whether the customer receives a cut in services from a cost cutting program or pays increased fees due to a revenue generation initiative, the customer's reception of the change depends upon his or her perception of the "added value" which results. Remember that we have defined "added value" such that it can be either positive or negative. The support or resistance of your customer base to any given revenue generating or cost cutting initiative depends upon their perception of the added value attached to it.

Ohio State Parks has achieved excellent results by paying attention to "adding value" in its revenue generation initiatives. Ohio State Parks have increased revenues from \$12,000,000 in 1992 to a projected \$20,500,000 in 1996 (Fiscal year ending June 30, 1996). Today, 41% of its operating funds come from revenues, versus 23% just four years ago. These results were possible because our customers perceived that, as we increased fees, added new fees, and implemented cost cutting program changes, the value they received from the services we provide increased to a greater degree. Our customer resistance to these changes has been quite manageable, and support for our initiatives has been increasing, as evidenced in our customer satisfaction survey and by increasing visitation and units sold.

Graphical representation of customer satisfaction levels is shown in a four-year history of our customer satisfaction survey in Figure 1. A graphic of our last ten years history of revenue generation success is shown in figure 2 and Table 1.

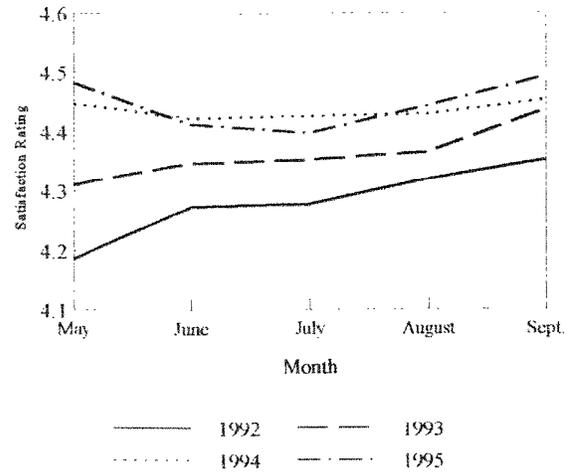


Figure 1. Ohio State Parks customer satisfaction rating.

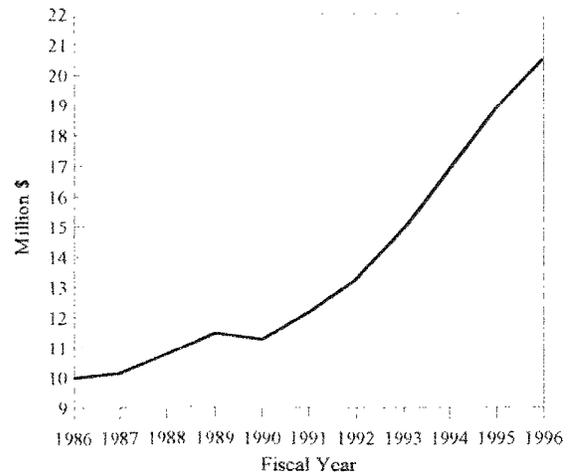


Figure 2. Ohio State Parks revenues received and deposited.

The discussion of our application of the concept of "added value" to achieve these two goals breaks down into six topic areas:

1. Adding value with new services for a profitable fee.
2. Adding value to existing free services while placing a new, first-time charge on them.
3. Adding value to services while implementing cost cutting programs.

4. Adding value with increased prices while boosting the perception of increased value for the customer.
5. Adding value to existing services to increase market share and use levels.
6. Adding value to the shoulder seasons as a marketing tool to attract customers in slack periods and increase sales volume.

Table 1. Ohio State Parks total revenue and percent annual change.

Fiscal Year	Total Revenue	Inc/Dec Amount	Percent Change
1986	\$9,986,938	\$490,059	5.2%
1987	\$10,122,514	\$135,576	1.4%
1988	\$10,747,947	\$625,433	6.2%
1989	\$11,460,785	\$712,838	6.6%
1990	\$11,261,846	(\$198,939)	-1.7%
1991	\$12,154,618	\$892,772	7.9%
1992	\$13,244,099	\$1,089,481	9.0%
1993	\$14,909,566	\$1,655,467	12.6%
1994	\$16,859,550	\$1,949,984	13.1%
1995	\$18,877,786	\$2,018,236	12.0%
1996	\$20,500,000	\$1,622,214	8.6% ^a

a/ This reflects closure of facilities for major remodeling.

Adding value with new services for a profitable fee.

One of our best examples of this effort is the addition of Rent-a-RVs to our campgrounds. There is a market out there for a fully set up, air-conditioned, carpeted, micro-waved, TV'd, fully outfitted RV for rent. The market may be, in part, seniors and also families who want to experience camping without the hassle of tents, mosquitos, smokey fires, heat and humidity, and the like. Another part of this market is folks who want to try out RV camping before they purchase their own RV.

This is a thin market and locations must be chosen next to large urban areas in our larger campgrounds. Any given location will only support from three to six of these units. We purchase 28-foot RV trailers and connect them on a campsite to all utilities. We calculate our return on investment on a minimum of 100 nights per season and plan to have the RVs fully depreciated within 15 to 30 months. Their life expectancy is five to seven years, at which time we will sell them in the after market and recover part of our original investment to defray the cost of their replacement.

Customers love them - especially single-parent families. They fill a niche in the marketplace and generate new business for us.

We have also purchased bicycles and paddle boats for rental in many campgrounds and day use small lake areas. Sometimes the park manager purchased used equipment and fixed it up to keep investment low in case theft became a problem. Theft has been almost negligible. Kids seem to like running around on an eclectic collection of kids bikes, and used equipment is preferred sometimes. We do buy some new bicycles and a nice new tandem bike for the adults. This gives our customers "something to do." "Something to do" is a request that comes through on our

customer satisfaction survey strongly. It also more than pays for itself.

Adding value to existing free services while placing a new, first-time charge on them.

Our picnic shelters were free to all, and in many locations they had experienced low levels of use. We established a reservation system and a fee for reserving many of them, up to a year in advance. We experienced increased usage often as people found out that they did not have to have "grandpa" get up at 4:00 a.m. to go sit at a picnic shelter so they could be assured of having it for a family gathering.

There has been virtually no customer resistance, since most appreciate the idea that they can now plan for family reunions and the like at our picnic shelters. Our maintenance crews also like the reservation system because they can assure customers a freshly-cleaned shelter for their reserved time. Customer satisfaction has increased on two counts.

Many of our campgrounds have experienced "curiosity drive throughs" by people who do not wish to stay there but want to see what is going on. There are also many people and vehicles who want to "visit" someone in the campground. We put a \$1.00 or \$2.00 fee on these drive-throughs, extra and visiting vehicles to attempt to cut down the traffic. Amazingly, we encountered very little customer resistance. The people who were not our customers would not pay the nuisance fee. Those with legitimate business seemed not to mind and understood what we were trying to do.

The best example of customer reception was in one park's campground whose manager had some real misgivings about an added fee for something before which had been free. He was personally approached by, and received a number of letters from, mothers who had real concerns about child safety with as many vehicles as had been driving around the camp ground before the fee went into effect. After the fee went into effect they were pleased with the decrease in unnecessary campground traffic and increased child safety.

Adding value to services while implementing cost-cutting programs.

Check in procedures for our cabins and campsites, until recently, entailed the completion of three different forms that had to be filled out by hand. Cash was kept in a cash drawer or even a "cigar box."

We consolidated the forms down to one universal form and installed cash registers and computers as appropriate. Now we use the cash register receipt for the customer rather than a hand receipt. Check in times have significantly speeded up and the number of attendants needed in check stations has decreased to some extent. Customers, of course, like the much shorter check in procedures, employees like the automation (once they got used to it), and we have saved some labor costs.

The same idea applies to the timing of restroom cleaning. In many locations, cleaning was scheduled for the busiest times so that customers got as clean a restroom as possible. In too many other locations, restroom cleaning was scheduled for after the

busiest times so that there would little conflict with customers and the resultant mess could be most efficiently cleaned up.

If, in fact, cleaning is scheduled before these busiest times, the conflict with customers is reduced and restrooms can be cleaned much faster, with much greater customer satisfaction and with the most cost effective use of employee time.

Adding value with increased prices while boosting the perception of increased value for the customer.

The idea of adding value through differential pricing is one that customers tend to like. It seems inherently fair that if someone gets something extra, there should be an appropriate fee for it. We have installed differential pricing in a variety of situations quite successfully. Slightly higher fees for campsites or cabins that have direct water access or a special view, holiday times when we have to pay time-and-a-half to all employees, amenities such as electricity at campsites and fireplaces in cabins all have relatively high levels of customer acceptance. Sometimes, customers routinely ask for the higher priced offerings, and use levels have actually gone up for some higher priced locations.

We have found that modest price increases are reasonably well accepted when they are tied to the perceived added value of improved amenities or general improvements in physical plants such as repainting, repaving, or fixing up generally.

Adding value to existing services to increase market share and use levels.

In response to customer requests, we initiated the sale of firewood, ice, and camper food and sundries at most campground check in stations. We did not add any extra physical plant nor any additional check in personnel. This idea, like the acceptance of credit cards for payment of fees, enables the camping or cabin or boat dock customer to stay longer without having to travel some distance outside the park. It provides convenience to our customers. This has helped to extend our length of stays and has generated profits from sales of goods.

In response to requests in our customer surveys for "something to do," we have started "free game boxes." These large boxes or cabinets are full of both outdoor items like horse shoes, soft balls and bats, volleyballs, basket balls and soccer balls and indoor games like Monopoly, Scrabble, and children's games. All of our customers can check out these games free of charge. We have already installed horse shoe pits, sand volleyball courts and basketball hoops, and provide large, mowed areas for soccer and softball. The reception to this has been quite positive among our customers. Many parents appreciate the indoor games for rainy days with their children. Theft has also been negligible.

One of our most innovative park managers got a slightly used, portable, 9-hole miniature golf course for a very reasonable price. Rather than charge a fee, he set it up for free use in a beautiful pine shaded area of his campground. He sold 2,000 more

campsites this past summer than he had sold the previous summer. There is surely some relationship there.

Our park naturalist program is, of course, the most traditional example of adding value to the existing services within state parks. Regrettably, in today's cost-cutting atmosphere, naturalist-led programs are the first to go. We have restored our naturalist programs to levels that are the greatest in the history of the system. As my long time naturalist manager put it: "the good old days are today" for park naturalists. This example of adding value to existing services is what differentiates state parks from all other outdoor recreation offerings.

Adding value to the shoulder seasons as a marketing tool to attract customers in slack periods and increase sales volume.

The shoulder season provides one of the best opportunities for us to use the idea of "added value" to deliver higher customer satisfaction, generate more business, and better use our existing physical plant. Park operation is a fixed-cost business. Once a park is open, it generates over 80 percent of its costs in utilities and labor. Our season has historically been the Memorial Day to Labor Day 100-day period. May and September have had some shoulder use depending upon weather conditions and holiday dates.

The fall season in the Midwest, up through mid November, is usually a period of sunshine, low humidity, and pleasant temperatures. It is an ideal time to be outdoors. However, the press of work schedules and school attendance leaves a limited amount of time for recreation for which we have to compete. The only way we can effectively compete for people's limited leisure time during this most ideal time of year is to add value to their stays with us beyond what they expect during the summer season. We have begun doing that with harvest festivals, Halloween campouts, and a great variety of special events that we can use to add value to the customers' stay with us in the fall.

We have found that price cutting is not an answer in this period to attract business. People will not accept services they do not want even if they are offered free of charge. If the service is something they desire, they will pay a reasonable price for it. The answer is using added value to compete for people's scarce leisure time successfully. Each year Ohio's state parks have seen their greatest increase in usage during the fall months as more parks carry out special fall programs

A Closing Comment

The idea of "adding value to the outdoor recreational experience" is a thread that pulls together three program areas in which we have some success. The areas of increasing fee revenues, improving customer satisfaction, and building visitation and marketshare are all positively affected by application of added value initiatives. Adding value is also supported by our employees, who like the idea of being part of a team that is recognized for the high quality services it provides.

ENVIRONMENTAL VALUES, ENVIRONMENTAL ETHICS, AND NATIONAL FOREST MANAGEMENT: AN EMPIRICAL STUDY¹

Robert E. Manning

Professor, University of Vermont, Recreation Management Program, School of Natural Resources, 356 Aiken Center, Burlington, VT 05405.

William Valliere

Research Assistant, University of Vermont, School of Natural Resources, 361 Aiken Center, Burlington, VT 05405

Ben Minter

Graduate Research Assistant, University of Vermont, School of Natural Resources, 210 Aiken Center, Burlington, VT 05405

Introduction

Management of the national forests is an important public policy issue in the environmental arena. Specific natural forest management issues are highly diverse and include clear cutting, preservation of endangered species and biodiversity, wilderness designation and management, sustainability, and tradeoffs between competing uses. Often, these issues are highly controversial.

Information on public attitudes toward such issues can be useful in helping to guide appropriate national forest management, and many such studies have been conducted (e.g., Dunlop 1992; Dennis 1988; Shindler et al. 1993). However, it may equally useful to explore the underlying ideas that may drive such attitudes. We think the environmental values and ethics of the public may help explain attitudes toward national forest management. Thus, this study focused on three primary variables.

Environmental Values

Nature can be seen to carry many values that may be important to humans. These values can be understood as the functions or products of nature from which humans derive material or nonmaterial benefits. Examples include nature as a place for outdoor recreation and nature as a source of raw materials for economic development. Some values in nature may accrue directly to individuals, while others may be more indirectly diffused through society as a whole.

Environmental Ethics

It is inevitable that humans interact with nature, but what ideas govern or structure this interaction? What is the appropriate

relationship between humans and nature, and how is this determined? For the purposes of this study, environmental ethics are defined as the diversity of ideas that drive human-nature relationships. Examples include stewardship of nature as a religious duty and natural rights of nature.

Attitudes Toward National Forest Management

As noted above, national forest management issues are diverse. Moreover, public attitudes toward these management issues have been found to vary. However, a unifying theme among many of these management issues concerns the degree to which national forests should be managed for material or nonmaterial uses. Thus, this general issue was used in this study as the focus of public attitudes toward national forest management.

Study Objectives and Methods

The overall purpose of this study is to explore the variables described above empirically. For example, what are the environmentally-related values and ethics of the public? Moreover, how are these values and ethics related to attitudes toward national forest management? To answer these questions, three objectives were defined for this study:

1. Conceptualize and classify environmental values and ethics.
2. Develop scales to measure environmental values and ethics.
3. Analyze relationships between environmental values and ethics and attitudes toward national forest management.

The first objective was pursued through literature review. There is a rich literature in history, philosophy, and a variety of environmentally-related fields regarding environmental values and ethics. Much of this literature is reviewed in contemporary texts, including Bailes (1985), Calicott (1995), Des Jardins (1993), Elliot and Gare (1983), Glacken (1956), Hargrove (1989), Merchant (1993), Nash (1983;1989), Petulla (1988), Simmons (1993), Taylor (1986), Rolston (1988), Van De Veer and Pierce (1994), Worster (1977; 1993), and Zimmerman (1993). Based on this literature, 11 potential values of national forests were identified as shown in Table 1, and 17 environmental ethics were identified as shown in Table 2. The 17 environmental ethics were further classified into five broad categories. We do not necessarily suggest that these broad categories of ethics are ideas that clustered together within segments of society. These categories represent groups of ideas that we feel have some conceptual commonality.

The second study objective involved development of scales to measure the values and ethics outlined above. Values were measured by means of a battery of statements describing the 11 potential values of national forests. Respondents were asked to rate the degree of importance they attached to national forests as a place to attain these values. A six-point response scale was used, ranging from "not-at-all important" to "extremely important."

Ethics were measured by means of a battery of statements that attempted to capture alternative dimensions of each of the 17 environmental ethics. Two components of support for each statement were measured. The first measured the extent to which respondents agreed with the statement. An eleven-point response scale was used, anchored at "strongly agree" and "strongly

¹This study was supported through a cooperative agreement with the USDA Forest Service, North Central Forest Experiment Station, and the McIntire-Stennis Forestry Research Program.

disagree." The second component measured the importance respondents placed on each statement in influencing their attitudes toward natural resource and environmental issues. A six-point response scale was used, anchored at "not-at-all important" and "extremely important." An initial battery of 104 statements was pretested on a group of 150 undergraduate students who were asked to comment on any problems, ambiguities, or other difficulties in interpreting and responding to the statements. Based on this pretest, 42 statements were retained. Each environmental ethic was measured with between two and four statements. Representative statements are shown in Table 2.

Table 1. Environmental Values

Value	Average Importance Rating*
Aesthetic	5.55
Education	5.15
Recreation	5.07
Therapeutic	5.07
Ecological	4.56
Scientific	4.44
Intellectual	4.34
Historical/cultural	4.31
Moral/ethical	3.84
Spiritual	3.54
Economic	2.36

* 1= "not at all important," 6= "extremely important."

The third study objective was accomplished by means of a survey of a representative sample of Vermont households. The values and ethics scales were incorporated into a written questionnaire.

In addition, a third battery of questions was developed to measure attitudes toward management of the Green Mountain National Forest, in Vermont. These questions were directed at the general issue of material versus nonmaterial values as described earlier. A series of 15 statements was constructed, and respondents were asked the extent to which they agreed with each statement. A five-point response scale was used, anchored at "strongly agree" and "strongly disagree." The 15 statements are shown in Table 3.

The study questionnaire containing the above measures was administered to a representative sample of 1500 Vermont households chosen from telephone directories covering the state. The questionnaire was administered in the spring of 1995 following procedures recommended by Dillman (1978). Two-hundred seventy-two questionnaires were returned as undeliverable, reducing the sample size to 1228. Six hundred twelve completed questionnaires were returned, yielding a response rate of 50 percent.

Study Findings

National Forest Values

Findings regarding the values associated with the Green Mountain National Forest are shown in Table 1. Most values were judged relatively important by respondents. In fact, 8 of the 11 values received an average rating of at least "moderately" important. Three values in particular were rated very highly: aesthetic, ecological, and recreation. Five values--educational, moral/ethical, historical/cultural, therapeutic, and scientific--make up a second tier of importance. A third tier of forest values drew relatively low importance ratings and included intellectual, spiritual, and economic values.

Table 2. Environmental ethics

Environmental Ethics		
Category	Ethic	Representative statement
Anti-environment	Threat to survival	Nature is a threat to human survival.
	Spiritual evil	Nature is evil.
Benign Indifference	Storehouse of raw materials	Nature is a valuable storehouse of raw materials
	Religious dualism	Humans were created as fundamentally different from the rest of nature.
Utilitarian Conservation	Intellectual dualism	The ability to think makes humans fundamentally different from the rest of nature.
	Anthropocentric humanism	Human cruelty toward animals is wrong because it could lead to cruelty toward other humans.
Stewardship	Efficiency	Humans should manage nature as efficiently as possible.
	Quality of life	Nature is important because it adds to the quality of our lives.
	Ecological survival	Protecting ecological processes is important to human survival.
	Religious/spiritual duty	It is our religious/spiritual duty to take care of nature.
	Future generations	Nature should be protected for future generations.
Radical environmentalism	God's creation	Humans should protect nature because it is God's creation.
	Mysticism	All living things had a spirit.
	Humanitarianism	Humans should not cause needless pain and suffering to animals
	Animism/organicism	Nature should be protected because it is sacred
	Pantheism	Nature should be protected because all living things are interconnected
	Liberalism/natural rights	Nature should be protected because all living things have a right to exist.

Table 3. Attitudes toward National Forest Management

Statement	Mean Score
Management of the Green Mountain National Forest should emphasize production of timber and lumber products.	3.28
Clearcutting should be banned on the Green Mountain National Forest.	1.77
Mineral exploration and extraction should be encouraged on the Green Mountain National Forest.	3.76
Greater protection should be given to fish and wildlife habitats on the Green Mountain National Forest.	1.86
Some existing wilderness areas on the Green Mountain National Forest should be open to logging.	3.37
Greater efforts should be made to protect the remaining undisturbed forests on the Green Mountain National Forest.	1.83
Endangered species laws should be set aside on the Green Mountain National Forest to preserve jobs.	3.87
More wilderness areas should be established on the Green Mountain National Forest.	2.37
The economic well-being of timber workers and their families is more important than preservation of undisturbed forests on the Green Mountain National Forest.	3.81
Management of the Green Mountain National Forest should emphasize a wide range of benefits and issues rather than timber and wood products alone.	1.84
The economic vitality of local communities should be given highest priority when making Green Mountain National Forest decisions.	3.24
Management of the Green Mountain National Forest should focus on the forest as a whole and not on its individual parts (such as bears and trees).	2.20
Logging on the Green Mountain National Forest should not be allowed to disrupt the habitats of animals such as bears.	2.18
Logging on the Green Mountain National Forest should be allowed even if it diminishes the scenic beauty of the area.	4.07
Ski areas should be allowed to with-draw water from streams on the Green Mountain National Forest even if there are some ecological impacts.	3.73

a/ 1 = "strongly agree"; 5 = "strongly disagree"

Environmental Ethics

Findings regarding environmental ethics are shown in Figures 1 and 2. As these figures illustrate, most environmental ethics received some degree of support and importance from respondents. Nearly all ethics elicited mean agreement responses on the positive side of the scale, and most drew at least "moderate" importance ratings.

Some environmental ethics enjoy relatively high levels of agreement and importance. All four environmental ethics in the utilitarian conservation category received high mean agreement and importance ratings. Stewardship ethics were also widely embraced by respondents, with three of the four ethics in this category receiving strong support. In addition, three environmental ethics in the radical environmental category

enjoyed high mean agreement and importance scores.

Respondents tended to be largely equivocal toward environmental ethics in the benign indifference category, as evidenced by relatively low agreement scores associated with these three environmental ethics. Lastly, environmental ethics making up the anti-environment category were generally rejected by respondents and considered relatively unimportant in influencing respondents' attitudes toward natural resource policy

Attitudes Toward National Forest Management

Findings regarding attitudes toward national forest management are shown in Table 3. Considerable diversity in attitudes among statements is evident. However, usually, statements that emphasized material values in national forest management met with more disagreement than agreement. Conversely, statements that emphasized nonmaterial values in national forest management met with more agreement than disagreement.

Relationships Between Environmental Values and Ethics and National Forest Management

The final objective of this study was to analyze the relationships between environmental values and ethics and attitudes toward national forest management. This required several statistical operations. First, respondent scores on the 15 national forest management statements were aggregated in a composite index. Respondents received an overall index score ranging from 1 to 5, with 1 representing a strong materially-oriented attitude toward natural forest management and five representing a strong nonmaterially-oriented attitude.

Second, a factor analysis was performed on the environmental ethics data. As a data reduction technique, this permitted the identification of a relatively small number of variables that could be used in a multiple regression analysis. It also facilitated the identification of underlying relationships among the environmental ethics statements that might not otherwise have been directly observable. This was important as it provided a statistical test of the validity of the classification of environmental ethics upon which this portion of the study was conducted.

Responses on the agreement and importance scales for each of the 42 environmental ethics items were multiplied and the products were subjected to factor analysis using Alpha extraction and Varimax rotation. Items with a rotated loading score of .35 or greater were considered significant and determined to be a part of the resulting factors.

Ten environmental ethics factors were produced from the 42 scale items. Overall, factor analysis of scale item statements produced environmental ethics similar to those constructed through literature review and described earlier in this paper. There were, however, several differences. Figure 3 presents the resulting environmental ethics factors, with revised titles, and their relationships to the originally conceptualized environmental ethics. Mean index scores for the resulting environmental ethics were created through averaging the scores for each statement contained within each environmental ethic factor. This index score ranged from -30 to 30, following the multiplication of the original agreement (-5 to 5) and importance (1 to 6) scales.

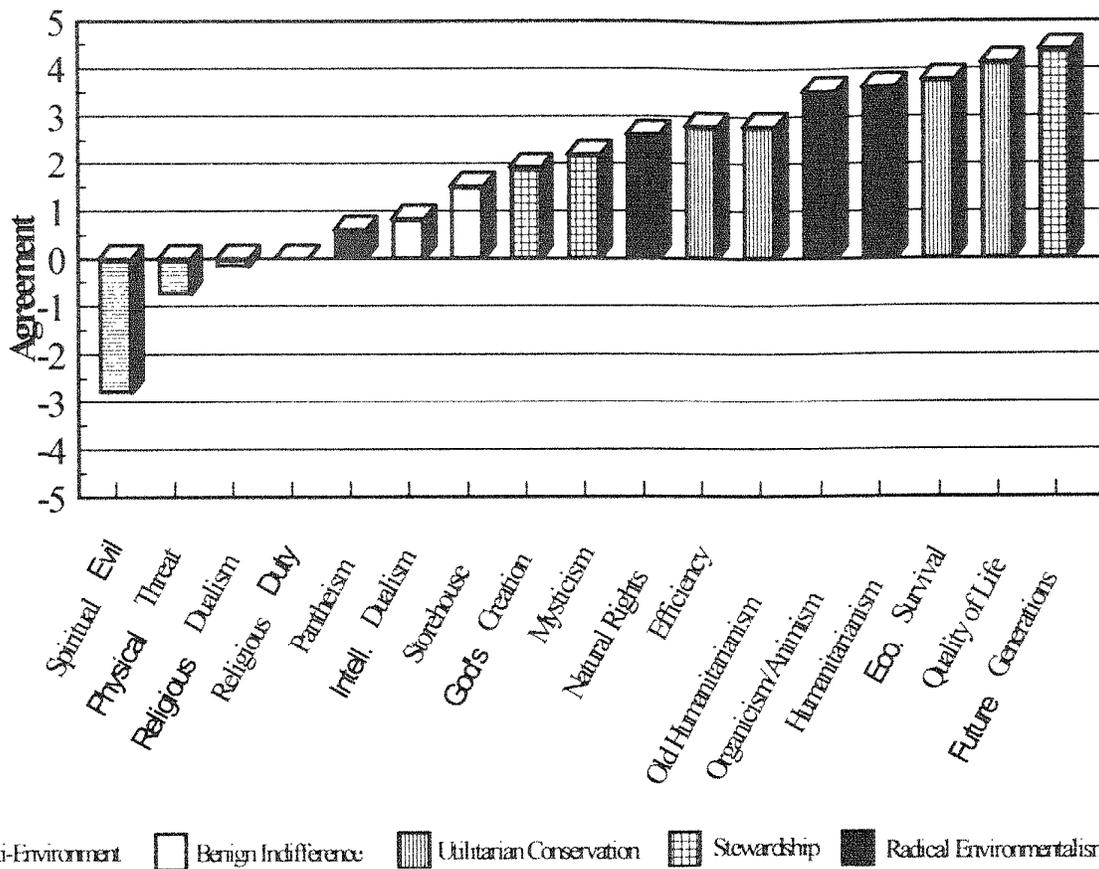


Figure 1. Environmental ethics - agreement.

Third, a series of three regression analyses was performed. This analysis was conducted to determine the amount of variation in attitudes toward national forest management explained by forest values and environmental ethics. Results are presented in Tables 4 through 6.

Table 4 presents the results of the multiple regression analysis for attitudes toward national forest management and forest values. Six forest values entered into the regression equation at a statistically significant level. These six values produced an R^2 of .4896, indicating that they explained approximately 49% of the variation in attitudes toward national forest management.

Table 5 presents the results of the multiple regression analysis performed for attitudes toward national forest management and environmental ethics. Six environmental ethics entered into the multiple regression analysis at a statistically significant level. Moreover, these six environmental ethics produced an R^2 of .4664, explaining approximately 47% of the variation in attitudes toward national forest management.

Table 4. Regression analysis between forest values and attitudes toward National Forest management.

Independent Variables	B	Beta	S.E.
Ecological value	-.1130	-.2364	.0186
Aesthetic value	-.0578	-.1187	.0195
Spiritual value	-.0282	-.0960	.0115
Moral/ethical value	-.0452	-.1182	.0161
Economic value	.1883	.5089	.0117
Scientific value	-.0399	-.0960	.0154
R^2	.4896		

Table 5. Regression analysis between environmental ethics and attitudes toward National Forest management

Independent variables	B	Beta	S.E.
Liberalism/natural rights	-.0039	-.0823	.0022
Dualism	.0053	.1174	.0021
Religious duty	.0056	.1045	.0024
Organic sustainability	-.0240	-.3199	.0036
Storehouse	.0211	.4165	.0022
Quality of life	-.0129	-.2045	.0027
R^2	.4664		

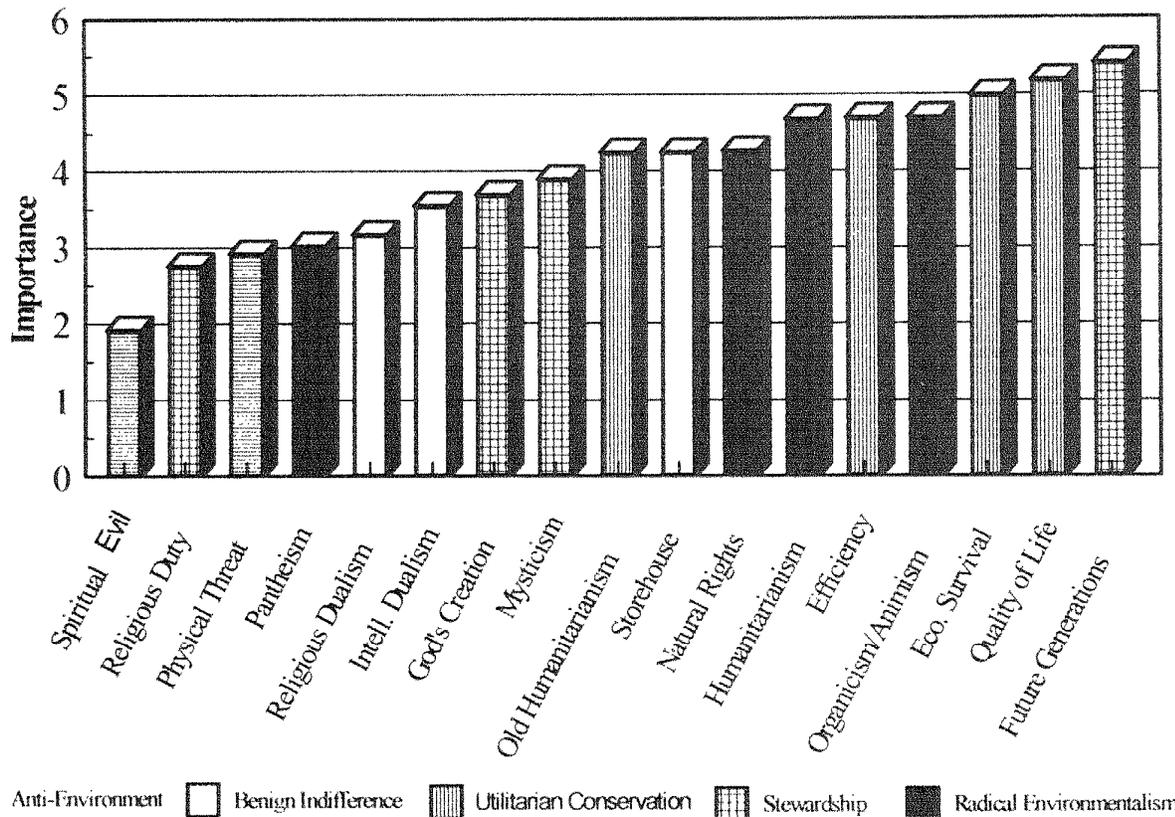


Figure 2. Environmental ethics - importance

Table 6 presents the results of the regression analysis performed for attitudes toward national forest management and environmental values and ethics. Four forest values and five environmental ethics entered into the analysis at a statically significant level. These nine independent variables produced an R^2 of .5999, explaining approximately 60% of the variation in attitudes toward national forest management.

Table 6. Regression analysis between forest values, environmental ethics, and attitudes toward National Forest management.

Independent variables	B	Beta	S.E.
Ecological value	-.0758	-.1604	.0195
Spiritual value	-.0367	-.1231	.0131
Moral/ethical value	-.0431	-.1139	.0168
Economic value	.1315	.3582	.0138
Dualism	.0038	.0834	.0018
Religious duty	.0065	.1222	.0023
Organic sustainability	-.0148	-.2004	.0032
Storehouse	.0105	.2083	.0021
Quality of Life	-.0098	-.1576	.0024
R^2	.5999		

Conclusions

Several conclusions might be drawn from this study. First, environmental values and environmental ethics can be isolated and measured. Traditionally, such environmentally-related values and ethics are treated primarily at a conceptual level. However, these intellectual notions can be defined more explicitly, classified, and measured through scale development and associated survey and statistical techniques. While the values and ethics-related classification and measurement scales are subject to continued refinement, they suggest that an empirical approach can be potentially productive and useful.

Second, the descriptive study findings provide some direct insights into environmentally-related values and ethics of the public and how these values and ethics apply to the national forests. Respondents value national forests for many reasons. While more direct or individually-related values, such as recreation and aesthetics, are rated as most important, less direct of more societally-oriented values, and also more abstract values, such as ecological protection and expression of moral/ethical obligations, are also rated as important. The public also subscribes to a diversity of environmental ethics, including those that might be generally described as anthropocentric (including stewardship and utilitarian ethics) and biocentric (including radical environmental ethics).

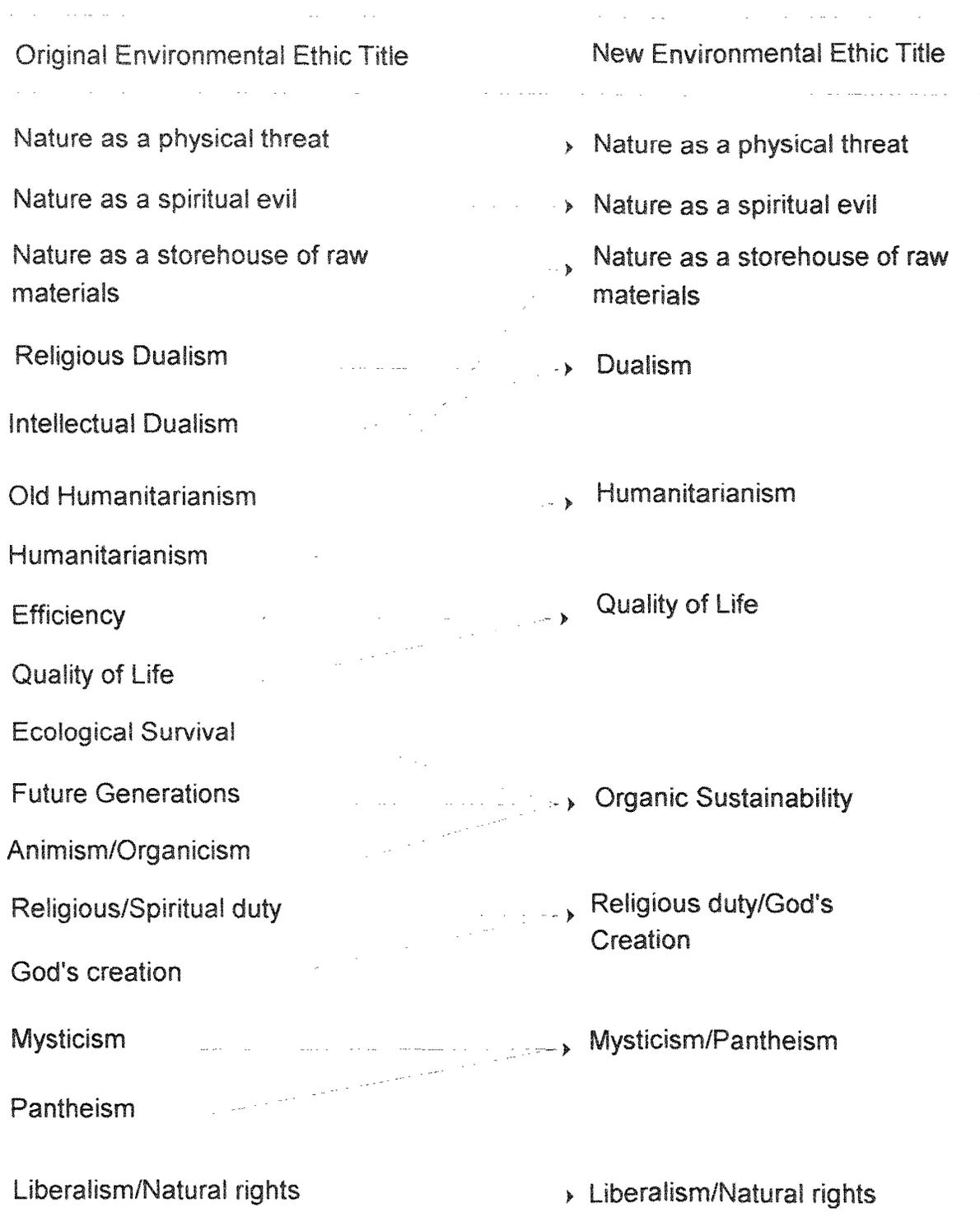


Figure 3. Environmental Ethics: Revised Titles from Factor Analysis.

Third, descriptive findings also provide insight into public attitudes toward national forest management. While a diversity of attitudes was represented, respondents tend to favor nonmaterial benefits of national forests over material benefits.

Finally, the analytical findings from this study provide insights into the relationships between environmental values, environmental ethics, and national forest management. Taken together, values and ethics explain approximately 50 percent of the variation in respondent scores on the overall national forest management scale. These statistical relationships mean that beliefs in selected environmental values and ethics are associated with certain attitudes toward national forest management. These types of relationships may help establish an empirical basis for comprehensive national forest management. For example, some national forests (or areas within national forests) may emphasize selected environmental values and ethics and adopt associated national forest management policies. This approach may allow national forest managers to more effectively meet the diverse and sometimes competing values and ethics of the public while avoiding potential conflicts.

An important limitation of this study is that it focused specifically on the Green Mountain National Forest and the residents of Vermont. Future studies should broaden this geographic base.

Literature Cited

- Bailes, K. (ed.). 1985. *Environmental history: Critical issues in comparative perspective*. Lanham, MA: University Press of America.
- Callicott, J. 1995. *Earth's insights: A survey of ecological ethics from the Mediterranean Basin to the Australian Outback*. Berkeley, CA: University of California Press.
- Dennis, S. 1988. Incorporating public opinion surveys on national forest land and resource planning. *Society and Natural Resources*, 1:309-316.
- Des Jardins, J. 1993. *Environmental ethics: An introduction to environmental philosophy*. Belmont, CA: Wadsworth Publishing Company.
- Dillman, D. 1978. *Mail and telephone surveys: The total design method*. New York, NY: John Wiley and Sons.
- Dunlop, R. 1992. *Trends in public opinion toward the environment: 1965-1990*. Philadelphia, PA: Taylor and Francis.
- Elliot, R. and A. Gare (Eds.). 1983. *Environmental philosophy*. University Park, PA: Pennsylvania State University.
- Glacken, C. 1967. *Traces on the Rhodian Shore: Nature and culture in western thought from ancient times to the end of the eighteenth century*. Berkeley, CA: University of California Press.
- Hargrove, E. 1989. *Foundations of environmental ethics*. Englewood Cliffs, NJ: Prentice Hall, Inc.
- Merchant, C. (ed.). 1993. *Major problems in American environmental history*. Lexington, MA, D.C. Heath.
- Nash, R. 1983. *Wilderness and the American mind*. New Haven, CT: Yale University Press.
- Nash, R. 1989. *The rights of nature*. Madison, WI: University of Wisconsin Press.
- Petulla, J. 1988. *American environmental history*. Revised edition. New York NY: Macmillan Press.
- Rolston, H. 1988. *Environmental ethics*. Philadelphia, PA: Temple University Press.
- Shindler, B., P. List, and B. Steel. 1993. Managing federal forests: Public attitudes in Oregon and nationwide. *Journal of Forestry*, 91:36-42.
- Simmons, I. 1993. *Environmental history: A concise interpretation*. Cambridge, MA: Blackwell Publishers.
- Taylor, P. 1986. *Respect for nature: A theory of environmental ethics*. Princeton, New Jersey: Princeton University Press.
- VanDeVeer, D., and C. Pierce. 1994. *The environmental ethics and policy book*. Belmont, CA: Wadsworth Publishing Company.
- Worster, D. 1977. *Nature's economy: A history of ecological ideas*. Cambridge, MA: Cambridge University Press.
- Worster, D. 1993. *The wealth of nature: Environmental history and the ecological imagination*. New York, NY: Oxford University Press.
- Zimmerman, M. (ed.). 1993. *Environmental philosophy: From animal rights to radical ecology*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

VALUE DIFFERENCES BETWEEN CONSUMPTIVE AND NONCONSUMPTIVE RECREATIONISTS

Rod Zwick

Associate Professor, Lyndon State College, Lyndonville, VT
05851

David Solan

Associate Professor, Mansfield University, Mansfield, PA
16680

Abstract: This paper explores personal value differences and similarities between consumptive and nonconsumptive recreationists (hunters/anglers vs. nonhunters/nonanglers). A Mann-Whitney μ revealed that hunters differed from nonhunters on 10 of the 18 Terminal Values of the Rokeach Value Survey; anglers and nonanglers exhibited almost an identical differentiation on the same values. Consumptive recreationists displayed a more personal security orientation in their value patterns as compared with nonconsumptive recreationists. Nonconsumptive recreationists were characterized by a societal orientation in their value patterns compared with those engaged in consumptive activities. An examination of the basic or "core" personal values may provide a greater understanding of conflict among groups or individuals over policies related to wildlife or natural resource management.

Introduction

A theory of behavioral and environmental setting choices in the leisure sciences continues to enjoy a popular appeal. Much of the research has focused on individual manifestations of such behavior-motive systems (accounts) for activity and setting choices, satisfactions in recreation, leisure attitude, psychological outcomes, and activity choice classification and typology systems (London et al. 1977; Crandall 1980; Brown and Haas 1980; Samdahl and Kleiber 1981; Gracfe et al. 1981). Although much progress has been made, Schreyer et al. (1984) note that the capacity to predict activity or setting choices has not been widely demonstrated--many managerial and theoretical questions remain.

In the search for more predictive understanding, one subset of individual/intersubjective level variables that offers promise is that of human/personal values. Although enjoying a rich history in the broader social sciences, values have been somewhat but not totally neglected in the leisure sciences. Value formation has been associated with camping, surfing, and fishing social worlds (Etzkorn 1964; Bryan 1977; Cheek et al. 1976); different value systems between users and resource managers have been noted (Clark et al. 1971); users holding different values have been associated with nontraditional uses of national parks (White and Schreyer 1981); and values successfully differentiated travel personality types and independent versus group travelers (Madrigal 1995). Jacob and Schreyer (1980) noted that values as cultural evaluations influence definitions of natural resources and

the establishment of a normative order of behavior for such places. In more theoretical discussions, Klausner (1969), Burch (1969, 1970), Cheek and Burch (1976), Burdge and Field (1972), Schreyer et al. (1984) suggest that personal values influence choice of recreation activities and settings to obtain desired leisure experiences.

These research efforts suggest the broad applicability of the concept of personal values to the leisure sciences. The purpose of this paper is a further application of the study of personal values to outdoor recreation activity choice decisions as they relate to consumptive and nonconsumptive users of natural resources. Specifically, this study explores:

- 1) value differences between those recreationists who engage in natural resources harvesting activities and those who do not (hunters/anglers vs. nonhunters/nonanglers).
- 2) value similarities between those recreationists who engage in natural resource harvesting activities and those who do not (hunters/anglers vs. nonhunters/nonanglers).
- 3) research and managerial implications of any differences or similarities.

Methods

The purpose of this study was to explore values and value patterns of residents of rural communities, and to examine if basic personal values could be discerned which differentiate between those who engage in natural resource harvesting activities and those who do not (i.e., differences between consumptive and nonconsumptive groups)

Data was collected using a mail survey of a stratified random sample of residents selected from 48 different towns within the Northeast Kingdom of Vermont, and eight communities in central western Massachusetts. A nonduplicative sample frame was constructed for each Vermont community using their respective tax roles and voter registration lists; in Massachusetts, town clerks supplied lists of the resident population for each community surveyed. The sample of residents selected from each community was based on a proportional representation of the total population across the sample communities; no fewer than 20 residents were selected from any single community. An initial survey was sent to 970 Northeast Kingdom residents and 1099 Massachusetts residents from the eight communities. Eight hundred eight (887) usable questionnaires were received, 443 usable surveys were received from the Northeast Kingdom. Four hundred forty-four (444) surveys were received from Massachusetts residents.

The effective response rate for the Northeast Kingdom was 50.2%; the response rate for Massachusetts was 43.6%. A follow-up sample of 150 of the original nonrespondents (83 usable responses) was sent a reduced set of questions to check on non response bias. No statistically significant differences were found in gender, educational level, participation in hunting or fishing, or age. The Massachusetts sample was, however, significantly different in three communities regarding income. The follow-up mail survey of nonrespondents also revealed no

difference in ($p \leq .05$ on all 18 terminal values) value patterns from the initial sample of respondents

Instrumentation

The framework for empirically studying patterns of values was built on Milton Rokeach's work (1973). Rokeach (1973) maintained that values exist as hierarchical (ranked) beliefs about end-states of existence (terminal values) and preferred ways of behaving (instrumental values). Using a reduced set of 18 terminal and 18 instrumental values, individual value patterns may be discerned or aggregated to represent a value pattern of a community or community type. The reliability and validity of the Rokeach instrument have been thoroughly tested and verified (Homant 1967); value patterns and value domains have been seen to be more reliable and effective predictors of attitudes and behaviors than single values. Because terminal values have been more reflective of personal orientations (Park 1971) they were used for analysis in this study.

Rokeach Value Survey (Form D) was used to ascertain value hierarchies of individuals. Form D of the Value Survey uses gummed labels, allowing the respondent to arrange the values in a hierarchical pattern without having to physically having to write a rank next to the value. Besides the Rokeach Value Survey, each respondent also received a 45-question instrument that asked them about their harvesting activities. Using a method developed by Feather and Peay (1975), values were rescaled using normal (z) transformation to be used in analysis with both parametric and nonparametric statistical techniques. Both instruments were pretested with 28 residents across the two states; the activity/demographic questionnaire was subsequently revised and retested until a final instrument was developed.

Analysis and Findings

A Mann-Whitney μ was employed to explore the differences in values between those who engage in selected resource harvesting activities and those who do not. The results revealed a significant difference between hunters and nonhunters on 10 of the 18 terminal values (See Table 1). Hunters' mean scores on the values "Comfortable Life," "Exciting Life," "Family Security," "Freedom," and "Pleasure" were significantly lower, suggesting a higher ranking. Conversely, nonhunters had significantly higher mean rankings (lower means) on "Equality," "Inner Harmony," "Wisdom," "World at Peace," and "World of Beauty." An interpretation of these values suggests that hunters display a *personal security* orientation versus a more altruistic or *societal* value pattern of nonhunters.

Differences in value patterns between anglers and nonanglers depicted in Table 2 showed remarkably similar patterns to those of hunters and nonhunters--10 of 18 values were ranked significantly different. Value pattern differences between anglers and nonanglers only varied from the hunter versus nonhunters on the value "Mature Love" and the value "Wisdom." Value patterns were very similar. Anglers had a significantly lower mean score on the value "Mature Love" (ranked 6th compared with 11th for nonanglers), and showed no differentiation on the mean value ranking of "Wisdom." Again, the *personal security* versus *societal* value orientation emerged.

Table 1: Differences in terminal value means for hunters and nonhunters

Value	Hunters	Nonhunters	Significance (p)
Comfortable Life	8.75	10.79	<.001**
Equality	10.32	9.17	.001**
Exciting Life	11.40	12.44	.003**
Family Security	3.52	4.67	<.001**
Freedom	5.11	6.46	<.001**
Health	3.93	4.07	.412
Inner Harmony	10.43	8.32	<.001**
Mature Love	8.83	9.35	.240
National Security	11.57	12.41	.077
Pleasure	11.27	12.34	.002**
Salvation	13.12	13.19	.188
Self-Respect	7.20	6.67	.081
Accomplishment	9.56	9.36	.649
Social Recognition	14.12	14.08	.231
True Friendship	8.37	7.83	.095
Wisdom	9.37	8.44	.010**
World at Peace	10.54	9.09	<.001**
World of Beauty	13.22	11.87	<.001**

* Significant at $\alpha \leq .025$

Table 2: Differences in terminal value means for anglers and nonanglers

Value	Anglers	Nonanglers	Significance(p)
Comfortable Life	9.64	10.77	.002**
Equality	10.00	8.95	<.001**
Exciting Life	11.65	12.64	.001**
Family Security	4.04	4.69	.012**
Freedom	5.68	6.49	.005**
Health	4.19	3.91	.211
Inner Harmony	9.31	8.48	.014**
Mature Love	8.73	9.69	.005**
National Security	12.09	12.24	.845
Pleasure	11.57	12.51	.002**
Salvation	13.39	13.01	.848
Self-Respect	6.81	6.93	.388
Accomplishment	9.70	9.13	.065
Social Recognition	14.01	14.17	.911
True Friendship	7.91	8.07	.615
Wisdom	8.92	8.45	.126
World at Peace	10.35	8.64	<.001**
World of Beauty	12.59	11.87	.017**

** Significant at $\alpha \leq .025$

A further disaggregation of the data to harvesters (i.e., those who hunt or fish, or engage in both) and nonharvesters, exhibited similar patterns to those of hunters vs. nonhunters and anglers vs. nonanglers. The exception was that the value "Sense of Accomplishment" emerged as differentiating harvesters from nonharvesters, while the value "Wisdom" did not (See Table 3). Values of harvesters were differentiated from nonharvesters on 11 of the 18 Terminal Values.

An examination of the total sample, state, and hunter and angler rankings in Table 4 indicate consistent high rankings for the top three values of "Health," "Family Security," and "Freedom," and similar low rankings across groups on "Social Recognition" and "Salvation." Hunters and anglers are distinguished, however, by

their higher rankings on "A Comfortable Life," "Exciting Life," and "Pleasure," suggesting a greater concern for an enjoyment/excitement or hedonistic domain; and higher rankings on the interpersonal domain characterized by the values "Family Security" and "Mature Love."

Table 3: Terminal value differences between harvesters and nonharvesters.

Value	Harvesters	Non Harvesters	Significance(p)
Comfortable Life	9.71	10.80	.002**
Equality	9.93	9.02	.003**
Exciting Life	11.67	12.69	<.001**
Family Security	3.97	4.80	<.001**
Freedom	5.59	6.60	<.001**
Health	4.16	3.93	.378
Inner Harmony	9.26	8.45	.015**
Mature Love	8.85	9.62	.027*
National Security	12.06	12.28	
.649Pleasure	11.63	12.51	.004**
Salvation	13.36	13.01	.798
Self-Respect	6.93	6.69	.344
Accomplishment	9.76	9.06	.021**
Social Recognition	14.10	14.08	.371
True Friendship	7.91	8.03	.691
Wisdom	8.95	8.39	.066
World at Peace	10.31	8.63	<.001**
World of Beauty	12.56	11.83	0.017**

* Significant at alpha \leq .05

** Significant at alpha \leq .025

Table 4: Rank of terminal value means for selected samples.

Value	Total	VT	Mass.	Hunters	Anglers
Comfortable Life	12	12	12	6	9
Equality	10	11	9	10	11
Exciting Life	15	16	15	14	14
Family Security	2	2	2	1	1
Freedom	3	3	3	3	3
Health	1	1	1	2	2
Inner Harmony	7	7	6	11	8
Mature Love	8	9	8	7	6
National Security	16	13	16	15	15
Pleasure	13	15	14	13	13
Salvation	17	14	17	16	17
Self-Respect	4	4	4	4	4
Accomplishment	9	8	10	9	10
Social Recognition	18	18	18	18	18
True Friendship	5	5	5	5	5
Wisdom	6	6	7	8	7
World at Peace	11	10	11	12	12
World of Beauty	14	17	13	17	16

Discussion

The study findings showed a relatively stable pattern of the top three ranked values across regions and respondent harvest status. Personal values, however, did differentiate between those who engaged in consumptive recreational activities such as hunting and fishing and those who did not. Moreover, there was a similarity in the values that differentiated between these groups.

An examination of the value patterns revealed that respondents who were classified as consumptive recreationists (or harvesters) displayed a more personal security orientation than those who were classified as nonconsumptive recreationists. Conversely, nonconsumptive recreationists were characterized by a more societal value pattern (i.e., respondents ranked "Equality," "Inner Harmony," "Wisdom," "World at Peace," and "World of Beauty" higher in their value patterns). Of particular significance to natural resource managers is the higher ranking for the value "World of Beauty" by nonharvesters (ranked 13th by both nonanglers and nonhunters) compared with harvesters ("World of Beauty" was ranked 16th by anglers and ranked 17th by hunters). Many studies have found this value to be highly correlated with positive environmental attitudes and consistently ranked in the 13th or 14th position in value hierarchies. This present study suggests that anglers and hunters may possess different attitudes toward environmental concerns or nature and suggests further study of their attitudes toward the natural environment.

The results of this study imply that natural resource managers and policy makers should consider personal values when considering policy change, mitigating conflict, and developing or planning communication strategies for building consensus. Such knowledge of values would be important in developing ways to carry out or communicate policy change and provide an understanding of the needs and motives of conflicting groups.

Policies that threaten the core values of personal/family security and freedom, such as a reduction in property rights or perceived rights to use of resources may be met with strong resistance in these rural areas by traditional wildlife harvesters. Even more specifically, hunter and angler concerns with "Family Security" "Mature Love," "A Comfortable Life," "Exciting Life," and "Pleasure" as compared to nonhunters and nonanglers suggest that such interpersonal and apersonal factors of enjoyment/excitement could very well conflict with the more external orientation of nonutilitarian users who are concerned with equality and more global world views. An examination of these two differing core value patterns may be at the heart of differences between utilitarian and nonutilitarian groups on single issues such as animal rights or posting of land, and strongly suggest that mediation may be much more difficult than simply dealing with the single issue, because they are "core" values affecting the entire belief system.

Personal values, thus, are an important segmentation variable for distinguishing among groups or social aggregates. The idea of value systems comprising different value domains or hierarchical patterns is also important because most situations in life activate multiple values. Often these multiple values are in conflict both internally within the individual and externally between groups, requiring they be resolved by the individual's value system or between value systems of groups. The latter is a more difficult task.

Determination of values relation to specific issues or specific demographic/socioeconomic criteria remain to be explored. We are now in that process, examining the value—value orientation—attitude—behavior relationship. For managers and others wanting to assess core or deep values, a reduced set of the Rokeach, or the more parsimonious List of Values (LOV) may be

administered in a relevant setting. These require little effort or time, but can provide critical linkages between values and the choices and behavior they drive.

Literature Cited

- Burch, W.R., Jr. 1969. The social circles of leisure: Competing explanations. *Journal Leisure Research*. 1: 125-147.
- Burch, W.R., Jr. 1970. Recreation preferences as culturally determined phenomena. In: B.L. Driver, Ed., *Elements of Outdoor Recreation Planning*, Ann Arbor, MI: The University of Michigan Press.
- Brown, P.J. and G.E. Haas. 1980. Wilderness recreation experience: The Rawah case. *Journal Leisure Research*. 12: 229-241.
- Bryan, H. 1977. Leisure value systems and recreational specialization: The case of trout fishermen. *Journal Leisure Research*. 9: 174-187.
- Burdge, R.J. and D.R. Field. 1972. Methodological perspectives for the study of outdoor recreation. *Journal Leisure Research*. 4: 63-71.
- Cheek, N.H. and W.R. Burch. 1976. *The Social Organization of Leisure in Human Society*, New York, NY: Harper and Row.
- Cheek, N.H., and Field, D.R. and R.J. Burdge 1976. *Leisure and Recreation Places*. Ann Arbor, MI: Ann Arbor Science Publishers.
- Clark, R.N., Hendee, J.C. and F.L. Campbell. 1971. Values, behavior, and conflict in modern camping culture. *Journal Leisure Research*. 3: 143-159.
- Crandall, R. 1980. Motivations for leisure. *Journal Leisure Research*. 12: 45-53.
- Elzkorn, K.P. 1964. Leisure and camping: The social meaning of a form of public recreation. *Sociology and Social Research*. 49: 76-89.
- Feather, N.T. and E.R. Peay. 1975. The structure of terminal and instrumental values: Dimensions and clusters. *Australian Journal of Psychology*. 27: 151-164.
- Graefe, A.R., Ditton, R.B., Roggenbuck, J.W., and R. Schreyer. 1981. Notes on the stability of the factor structure of leisure meanings. *Leisure Sciences*. 13: 51-65.
- Homant, R. 1967. *The Meaning and Ranking of Values*. Unpublished master's thesis. East Lansing, MI: Michigan State University.
- Jacob, G.R. and R. Schreyer. 1980. Conflict in outdoor recreation: A theoretical perspective. *Journal Leisure Research*. 12: 368-380.
- Klausner, S.Z. 1969. Recreation as social action. In: *A Program for Research in Outdoor Recreation*, Washington, D.C.: National Academy Sciences.
- London, M.R., Crandall, R. and D. Fitzgibbons. 1977. The psychological structure of leisure: activities, needs, people. *Journal Leisure Research*. 9(4): 252-263.
- Madrigal, R. 1995. Personal values, traveler personality type, and leisure travel style. *Journal Leisure Research*. 27: 125-142.
- Park, Y. 1971. *Junior College Faculty: Their Values and Perceptions*. Washington D.C.: American Association of Junior Colleges.
- Rokeach, M. 1973. *The Nature of Human Values*. New York, NY: The Free Press.
- Samdahl, D.M. and D.A. Kleiber. 1989. Self-awareness and leisure experience. *Leisure Sciences*. 2: 1-10.
- Schreyer, R., Knopf, R.C., and D.R. Williams. 1984. Reconceptualizing the motive-environment link in recreation choice behavior. In: *Proceedings: Symposium on Recreation Choice Behavior*, USDA Forest Service General Technical Report Int-184: 9-18.
- White, R.G. and R. Schreyer. 1981. Nontraditional uses of the National Parks. *Leisure Sciences*. 4: 325-341.

**PERCEIVED CONSTRAINTS ON TRAPPING
AMONG TRAPPERS IN SIX NORTHEASTERN
STATES**

Tammy J. Larkin

Undergraduate Student, Lyndon State College, Lyndonville, VT
05851

Rodney Zwick

Associate Professor, Department of Recreation, Lyndon State
College, Lyndonville, VT 05851

Abstract: With the decline in trappers, this study examined the reasons trappers may quit trapping. Principle component factors resulted in five dimensions of constraints. These factors included the loss of opportunity to trap, economic constraints, personal reasons, antitrapping interference, and social conflict. Subsequent cluster analysis resulted in four types of trappers: steadfast; antitrapping; social conflict; personal constraint.

Introduction

Wildlife officials and other resource managers have joined researchers in calling for applied research that provides understanding of the sociocultural aspects of wildlife use. They emphasize the need to determine what people do and why they do it. Social scientists have made considerable strides in the understanding of why people participate in wildlife related activities such as: hunting, fishing, and activities that have nonconsumptive interactions with wildlife (e.g., wildlife viewing, camping, backpacking). Understanding of other wildlife related activities, such as trapping, have received less attention. Moreover, little research has focused on why there has been attrition in some of these traditional consumptive activities related to wildlife and the motivations associated with the cessation of these activities. The purpose of this study was to identify some social, cultural, and political (i.e., policy) constraints that influence the cessation of trapping activities.

In the United States, the number of active trappers has been estimated to have declined from 480,000 to 160,000 since the mid 1980's (Todd and Boggess 1987, Hamilton et al. 1994). Regionally, in the late 1980's, New York and Vermont experienced a threefold decrease in licensed trappers from the early 80's (Glass et al. 1991). Economic market conditions may have influenced the decline in trappers during this period, as the European demand for pelts declined. There remains, however, a core group of active northeastern United States trappers who continually engage in the activity for reasons related to recreation and social relationships (Daigle et al. 1996).

This core group of trappers has been the focus of animal rights groups who have coalesced into political organization to restrict or prohibit trapping in many states (Daigle 1996). These animal rights groups also have influenced furbearer pelt markets through

their social activism. Concomitant with these organizations' influence on public policy and economic markets, is the continued industrialization and development that, in many areas, has eroded the availability of traditional trapping lands. Because of these social, economic, and opportunity constraints, the question remains to what extent these deterrents may influence this current core group of trappers to discontinue trapping.

Understanding the motives to quit trapping to wildlife managers is critical because trappers serve a useful management function for keeping furbearer and other wildlife species in check. Abundant populations exist even in face of increased human development, often resulting in human and wildlife conflicts. For example, agricultural commodities can be destroyed by wildlife; road and property damage may result from beaver damage; domestic livestock and pets may be killed; and diseases such as rabies may spread. Wildlife managers, thus, have a stake in stemming the loss of this valuable management tool - the trapper.

Methods

The purpose of this study was to explore licensed trappers' perceptions of constraints that would influence them to cease trapping, and develop a typology of trappers based on these perceptions

The data were collected in a six-state study by researchers from the University of Massachusetts and Lyndon State College, Vermont. The sample consisted of: 1) licensed trappers of four northeastern states (Maine, Massachusetts, New York, and Vermont), 2) licensed furbearer takers in Pennsylvania, and 3) licensed trappers of the West Virginia Trapping Association. A self-administered questionnaire consisting of 165 questions was mailed to a random sample of 3936 trappers. This study focused on 17 questions related to perceived constraints that would influence trappers to cease trapping. A total of 2279 usable surveys were returned after three survey waves and a postcard reminder. This represented an effective return rate of 65% across the six states.

A principal components factor analysis was used to reduce the data to manageable dimensions. Five perceived constraint factors were extracted including the loss of opportunity to trap, economic constraints, personal reasons, antitrapping interference, and social conflict. All states appeared to have similar factors that would motivate trappers to discontinue trapping.

The factor scores from the reduced scales were then used in a nonhierarchical cluster analysis to group respondents typology. Clusters of individuals in these types can be characterized as having common reasons for discontinuing from trapping.

Results

Seventeen variables were examined with a principal components method. A total of 1921 cases were used to generate the five factor solution. The number of factors extracted for the final solution was based on the convergence of eigenvalues (> 1.00) and a scree test. The results of the five factor Varimax rotation are shown in Table 1.

Table 1. Perceived Constraint Factors: Trapping.

Perceived Constraints	Factor 1 Loss of Opportunity	Factor 2 Economic Constraint	Factor 3 Personal	Factor 4 Anti Trapping	Factor 5 Social Conflict
Decline in furbearer (development)	0.839				
Decline in furbearer (pollution)	0.882				
Low furbearer population-over trapped	0.696				
Pelt prices too low		0.772			
Costs too much to trap		0.561			
No one to trap with			0.576		
Family/personal reasons			0.613		
Lost interest in trapping			0.573		
Avoiding conflict with antitrappers				0.687	
Possible antitrapping legislation				0.655	
Places to crowded-with trappers					0.618
Places to crowded-with other users					0.747
Adequate furbearer-areas to developed					0.688

Factor labeling was based on a minimal significant loading ($\geq .550$). The first factorial dimension was labeled "loss of opportunity to trap." Three of the 17 variables loaded on this factor including "decline in furbearer population due to development," "decline in furbearer population due to pollution," and "furbearer populations are too low because of over trapping." Two variables loaded significantly on the second factor. This factor reflected the economic constraints on trapping. The third factor reflected personal constraints such as declining health, no one to trap with, loss of interest. The fourth factor was an antitrapping constraint. Two of the 17 variables in the analysis loaded on this factor including "avoidance of conflict with people opposed to trapping," and "possible antitrapping legislation." The fifth factor was a social conflict/social carrying capacity dimension. Respondents in this factor said they would leave trapping because of social conflicts and crowding.

A non hierarchical cluster analysis (k-means) was then applied to the factor scores to partition trappers into groups (types). After a series of seven cluster runs from 8 clusters to 2 clusters, a four-cluster solution was selected as optimal based on a modified scree test and interpretability of the factors. Three of the five perceived constraint factors appeared to be significant in distinguishing four types (i.e., clusters) of trappers. An examination of the factor means of the first cluster (731 cases) suggested that no single factor could be identified as interpreting the cluster. Negative means indicated that these trappers would remain steadfast in trapping despite the negative constraints. The second cluster of 441 cases had a moderately high mean associated with the fourth factorial dimension, (antitrapping pressure). This cluster was labeled as antitrapping. The 458 cases of the third cluster were defined by the social conflict/social carrying capacity factor, suggesting this cluster should be labeled as social conflict. Loss of interest and declining personal/family health of the personal constraint factor defined cluster four (291 cases). This suggests a personal constraints cluster. This

typology of trappers may be used in subsequent analysis to examine if other empirical variables may be distinguished.

Implications

Natural resource management agencies face multiple constituencies in dealing with the furbearer resource. These constituents include licensed trappers (commercial and recreational; consumptive and nonconsumptive), people opposed to trapping, people affected by nuisance animals, and those who wish to view wildlife. All have needs and demands, yet those who are better organized and articulate have greater influence over public policy. In addressing the management of such furbearer resources, managers must entertain elements and meanings that elude the public eye (e.g., sustainable populations of furbearers, nuisance animal damage, disease control, loss of habitat due to development, increased costs of trapping, and social meanings of trapping). Often, however, managers have little or no empirical information about these elements and meanings that induce trappers to remain in the activity. Yet, the trappers are ultimately responsible for implementing furbearer management to maintain a sustainable population. Moreover, their license fees contribute to the operating income of agencies.

By understanding trapping constraints, management agencies can do a better job of promoting it as a management tool, and assure that it will remain as a viable opportunity in a pluralistic society.

Literature Cited

Daigle, J. Furtrapping values and motivations: a factor analytic study of trappers in six northeast states. Unpublished paper

Glass, Ronald J.; More, Thomas A.; Distefano, J. J. 1991. Vermont trappers: characteristics, motivations, and attitudes. In: DeGraaf, R. M., ed. Transactions of Northeast Section of the Wildlife Society. 48: 134-143.

Todd, A. W.; Boggess, E. K. 1987 Characteristics, activities, lifestyles, and attitudes of trappers in North America. In: Wild furbearer management and conservation in North America. Ontario, Canada: Ministry of Natural Resources: 59-76.