



3 1604 017 628 464

PROCEEDINGS

1985 National Outdoor Recreation Trends Symposium II

Volume II - Concurrent Sessions

Coordinated by:

Department of Parks, Recreation
and Tourism Management
Clemson University

Cosponsored by:

National Sea Grant College Program

USDA Forest Service

USDI National Park Service

In cooperation with:

National Society for Park Resources



GV191.4

N36

985

.2

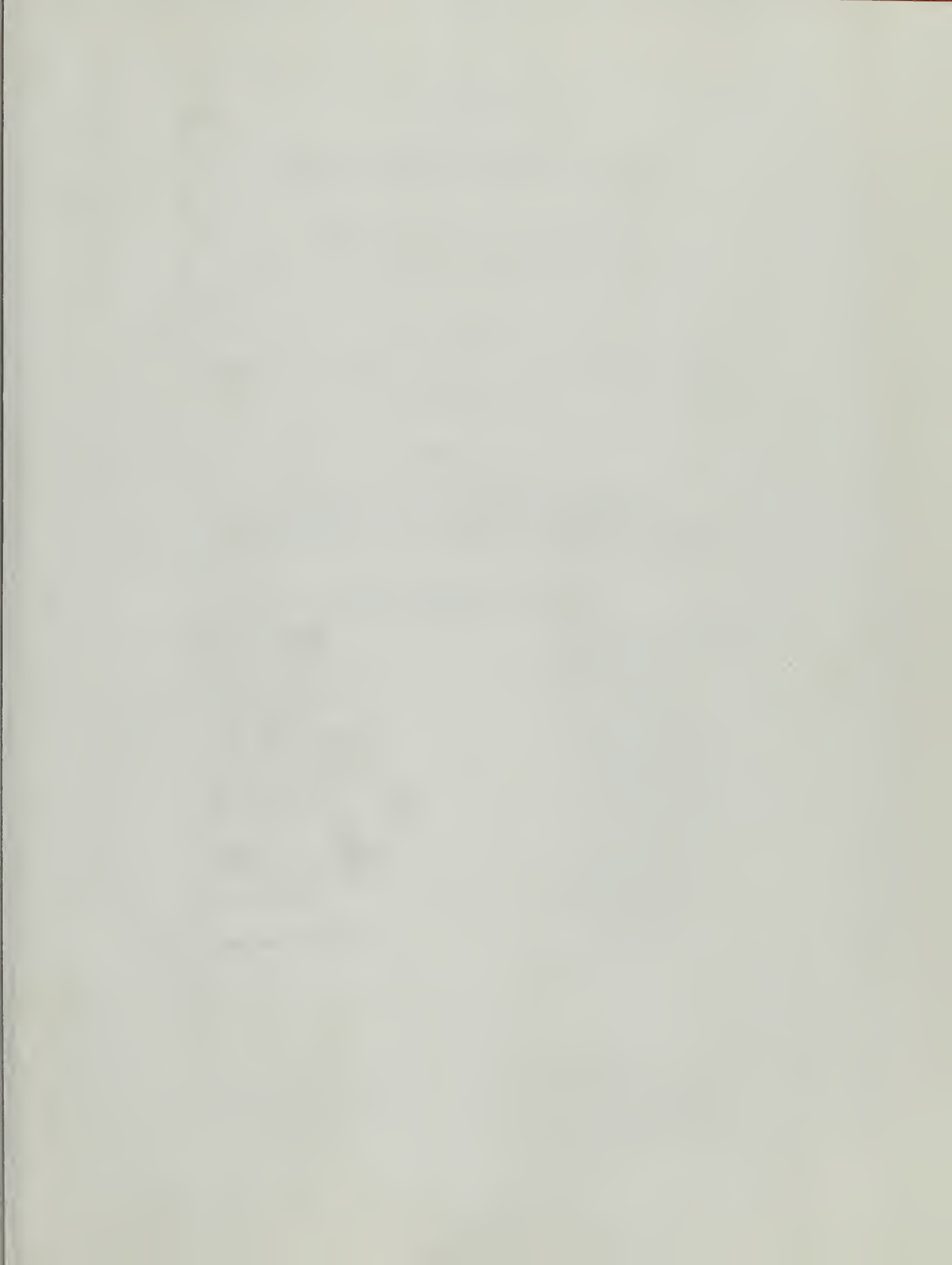
East Agricultural Experiment
Stations, NE-137

Carolina Department of Parks,
Recreation and Tourism



Digitized by the Internet Archive
in 2012 with funding from
LYRASIS Members and Sloan Foundation

<http://www.archive.org/details/proceedingsofnat02symp2>



PROCEEDINGS

OF THE NATIONAL
OUTDOOR RECREATION TRENDS SYMPOSIUM II

Held at the Myrtle Beach Hilton
Myrtle Beach, South Carolina
February 24-27, 1985

Coordinated by:

Department of Parks, Recreation and Tourism Management
Clemson University

Cosponsored by:

National Sea Grant College Program
U. S. Department of Agriculture, Forest Service
U. S. Department of the Interior, National Park Service

PROGRAM PLANNING COMMITTEE

GENERAL SESSIONS:

Malcolm Bevins
Tommy L. Brown
Gerald Cole
Ken Cordell
Derrick Crandall
Bill Gartner
Thomas D. Potts
George Siehl
Dan Styne

COORDINATING SERVICES:

Gina McLellan
Mary Seabrook

PROCEEDINGS EDITOR:

Jim Wood

CONCURRENT SESSIONS:

Roy Feuchter
Jay Gogue
Wil LaPage
Darrel Lewis
Robert McLellan
Jay McMillen
George Moeller
Robert Newkirk
Bill Shands
Carl Sullivan
Barry Tindall
Tim Tyrrell
Doug Wellman
Ralph Wilson
Gus Zaso

COOPERATORS

National Society for Park Resources
Northeast Agricultural Experiment Stations, NE-137
South Carolina Department of Parks, Recreation and Tourism
Institute of Outdoor Recreation and Tourism, Utah State University

FOREWORD

The 1985 Outdoor Recreation Trends Symposium, held February 24-27 in Myrtle Beach, South Carolina, provided managers, planners, researchers and others with an opportunity to share trend data and futuristic insights. The 1985 Symposium was a sequel to the first Outdoor Recreation Trends Symposium, held in Durham, New Hampshire, in 1980.

Papers presented at the 1985 Symposium addressed developing trends in economics, social characteristics, policy, tourism, recreation activities, the private sector, research and other facets of outdoor recreation. The Proceedings will be made available to the Presidential Commission on Outdoor Recreation Resources Review as it undertakes its assignment to reassess the status of outdoor recreation in America.

Most of us would agree that a phenomenal rate of change has occurred in outdoor recreation since the original Outdoor Recreation Resources Review Commission report in 1962. The research that focuses on what is happening in outdoor recreation has changed also. It has moved from the static descriptive and prescriptive research of the ORRRC era to a more dynamic approach that examines trends and shifts, not only in what we are doing in outdoor recreation, but why we do it. It is no longer enough to know that participation in certain activities grew in a given period; we must examine why! We now must know what motivates participation, how policy impacts these changes, what effect economic conditions have, how technology drives participation and so on. And we also seek sound predictions of what the future will bring so that we can plan better, develop better, invest better and manage better for this massive outdoor recreation business.

In 1980, Wilbur LaPage, Program Chairman for the first Outdoor Recreation Trends Symposium noted:

We attempt to plan the future of the Nation's recreation resources in the absence of facts about the present level and rate of growth of private investment in leisure industries. We define policy on the basis of out-of-date data and ideas about public participation in recreation activities. And we invest scarce research dollars in "problems" which may not exist, or might at least look different if we had adequate statistics with which to view them.

With these problems still facing us, the 1985 Symposium Program Planning Committee spent nearly two years compiling a program which would provide the most up-to-date and comprehensive trend data available. Though this goal was accomplished, we are the first to admit there are still gaps in trends research and still much room for improvement. Our challenge to you is to enthusiastically pursue quality trends research in the future and to convene five years hence to again share results. Outdoor recreation planners and managers want and need accurate trend data. And they deserve our best efforts to provide it.

Gina McLellan
Symposium Coordinator
Department of Parks, Recreation and
Tourism Management
Clemson University

CONTENTS

VOLUME II - CONCURRENT SESSIONS

SEA GRANT BLOCK

Consequences of Coastal Population Growth: Conflicts with Recreational Uses of the Coastal Zone -- Anthony J. Fedler	1
Recreation and Tourism in the Coastal Zone -- Joseph D. Fridgen	6
Access to Our Beaches -- Walter F. Clark	21
Marine Sport Fishing Trends -- Norville S. Prosser	30
The Future of Artificial Reefs in Fisheries Enhancement -- Richard B. Stone	39
Coastal Fishing Tournaments: A Review of Participant Characteristics, Motives and Spending Patterns -- Alan R. Graefe and James M. Falk	43
Boating: The Dream and the Challenge -- George R. Rounds	58
Urban Waterfronts: Positive Directions, New Problems -- Jon Lucy, Ann Breen and Dick Rigby	66

URBAN RECREATION BLOCK

Patterns of Use in an Urban Forest Recreation Area -- John F. Dwyer, Herbert W. Schroeder and Richard L. Buck	81
A Model of Non-Use of Urban Leisure Services -- Geoffrey Godbey	90
Evaluating and Interpreting Use Data in Urban Park Settings -- Thomas A. More	103

ACTIVITY TRENDS BLOCK

Outdoor Recreation Activity Trends: Insights from the 1982-83 Nationwide Recreation Survey -- Merle J. Van Horne, Laura B. Szwak and Sharon A. Randall	109
Market Share Analysis of Selected Public Leisure Services from 1979 to 1982 -- Rodney B. Warnick	131
Recreation Use Trends: A Forest Service Perspective -- Gary H. Elsner	143
Legal Liability Trends in Outdoor Recreation -- Bruce B. Hronek	148
Emerging Trends in Outdoor Adventure Recreation -- Alan Ewert	155

User Analysis and Documentary Film as a Tool for Implementing Park Changes -- J. M. Westphal	166
Fitness as a Life Style: The Trend toward Commitment -- Barbara M. Cordell	173
Outdoor Recreation for Individuals with Handicapping Conditions: Past, Present and Future -- Robert E. Cipriano	182

PLANNING/MANAGEMENT BLOCK

Against the Running Tide: Democracy and Outdoor Recreation User Fees -- David Cockrell and J. Douglas Wellman	193
Recreation Management in a Region Context -- Joseph P. Wallace	206
Recreational Use in the Marine Environment: Some Thoughts on Conflicts and their Resolution -- Niels West	214

NE-137 BLOCK

This program block presents the results of six individual studies funded by Agricultural Experiment Stations in the Northeast as part of the regional Hatch Project NE-137: "Economic Impacts of Tourism on Rural Development in the Northeast." Some of the studies had additional funding from other sources.

The Use of a Multivariate Technique in the Development of a Measure of Tourism -- Cristanna M. Cook, Stephen D. Reiling and William A. Halteman	230
State Parks and Residential Property Values in New York -- Tommy L. Brown and Nancy A. Connelly	245
Tourist Attractions and the Values of Surrounding Residential Property -- David Manfredonia, Daniel Rossi and A. Robert Koch	255
Property Taxation in Vermont's Second Home Communities, 1974-1980 -- Malcolm I. Bevins	269
Impact of Tourism on Town Revenues and Public Service Costs in Selected Delaware Shore Communities -- Gerald L. Cole and Gregory J. Kuserk	279
Economic and Non-economic Quality of Life Indicators in Rural Tourist and Non-tourist Communities -- Lawrence R. Klar, Jr., William Keegan and Rodney Warnick	292

DISPERSED/REMOTE RECREATION BLOCK

Trends in Dispersed Recreation on the Wildland Resource -- Paul Richard Saunders	299
Recreation Trends and Management of the Bob Marshall Wilderness Complex -- Robert C. Lucas	309

Marine Recreation: An Update of Effective Use of the Sea	
-- Tal Morash	317

TRACKING/MEASURING TRENDS BLOCK

Monitoring Trends in Recreation Quality with a Recreation Resource Inventory System -- Kenneth C. Chilman	327
Predicting and Understanding Outdoor Recreation Trends through the Use of Geographic Information Systems -- William H. Becker and Timothy J. Kelly	337
Measuring Camping Trends at Corps of Engineers Campgrounds -- Janet Akers Fritschen	354
Predicting the Direction of Participation Rate Trends with the Status Group Dynamics Approach to Recreation Demand -- Patrick C. West	362
Monitoring Local Trends in Recreation and Tourism through Visitor Statistical Abstracts -- Chad P. Dawson	371

LIST OF PARTICIPANTS AND SPEAKERS	(in volume I)
---	---------------

CONSEQUENCES OF COASTAL POPULATION GROWTH: CONFLICTS WITH
RECREATIONAL USES OF THE COASTAL ZONE

Anthony J. Fedler

Abstract.--Over one million people annually have been added to the nation's shoreline population since 1950. This growth has resulted in serious environmental problems such as habitat reductions and water pollution. Commercial, industrial and residential development, and extensive private ownership of the shoreline have further constrained public access to and usage of the nation's coastal resources for recreation. Continued coastal planning and management are needed to insure adequate public access to quality coastal recreation resources as coastal populations grow.

Additional keywords: coastal population growth, marine recreation, conflict, access, resource impacts.

Nowhere in this country has the demand upon the land and its resources been as great as along the oceans and Great Lakes coastlines (CMSER, 1969). Man has historically located in this region. As a result, nearly all major metropolitan areas are located in the coastal area. The growth of industry and manufacturing in the coastal region has closely followed population growth compounding the pressures on delicate coastal habitats, environments, and resources (Ehrlich and Ehrlich, 1970).

A chief concern of coastal planning and management agencies is the allocation of increasingly scarce resources for recreational purposes (Christy 1976). The increasing coastal population has also created greater demands for marine recreation opportunities (Ditton and Stephens 1976). If coastal population growth continues at the present rate, the scarce resources available for recreation will necessitate considerable advanced planning for wise utilization. The natural constraints on use of coastal areas for recreation are primarily those of space and access to that space to pursue a particular recreational activity. Many constraints are posed by other uses that preempt or interfere with recreation along the coast (Ketchum 1972).

Some of these constraints on coastal recreation can be related to land use and type and level of development, liquid and solid waste disposal, freshwater demand and availability, and collateral resource uses such as shipping and oil and gas development. While these activities in the coastal zone in and of themselves do not necessarily preclude or constrain recreational activity participation, it is their excesses or inadequate management that does so. These excesses and improper management problems are symptomatic of population growth pressures on finite land and water resources. To understand the forces affecting recreational participation in the coastal zone and the current and potential constraints on future participation, we must begin by examining coastal population growth trends.

COASTAL POPULATION GROWTH

Assessing the population growth of the United States coastal zone requires that a suitable framework be used to draw comparisons for relative growth of the coastal area being analyzed. Definitions of the U.S. coastal zone are

numerous and variable as seen in various coastal zone management (CZM) plans. State coastal zones range from one-half mile inland from the mean low tide mark in California, to the inclusion of one or two tiers of counties inland from the shoreline as in Texas. In Hawaii, the entire state is included in the CZM plan. In light of the variability in this coastal area where considerable management and planning effort is being focused, it was necessary for analysis purposes in this paper to attach a working definition to the term "coastal zone" so consistent data could be collected from each state for aggregation into regional and national totals.

For purposes of this paper, the coastal zone is defined as the first tier of counties directly adjacent to the oceans' and Great Lakes' shorelines. This includes counties adjacent to bays and estuaries up to the point where tidal influences end. These counties extend inland from 15 miles in some east coast states to over 50 miles in some west coast states, thus giving a somewhat imperfect, but workable view of the nation's shoreline county population.

Falling within the definition of coastal zone used in this paper were 332 shoreline counties. These counties comprise about one-tenth of the 48 contiguous states' counties and eight percent of the continental land mass or some 252,167 square miles of land. In 1980, the coastal margins of the U.S. were home to some 83.7 million Americans or 37% of the nation's population. Slightly more than one million people per year were added to the nation's coastal population between 1950 and 1980 resulting in a 60 percent increase for the 30 year period. Populations in the non-shoreline continental area of the United States during this same period grew by 44.5 percent.

The concentration of the nation's population in the coastal margins is highlighted further in special tabulations made by the U.S. Department of Commerce (1983) and reported in the Statistical Abstract of the United States. In 1980, approximately 53% of the nation's population lived within 50 miles of the two oceans, Gulf of Mexico and Great Lakes. This translates to over 119 million people residing on 15% of the continental 48 states' land area.

The nation's shoreline population size and growth rate varied considerably by region as seen in Table 1. Both the Great Lakes and North Atlantic coastal regions, which contain the greatest numbers of people, grew at a pace well below that of the nation. The South Atlantic, Gulf and Pacific coastal regions grew at rates two to three times the national average.

Population density within four of the five coastal regions in 1980 was similar (Table 1) with rates of between 200 and 300 inhabitants per square mile. Density in the heavily populated North Atlantic coastal region was between three to four times that of other regions. The population densities among all U.S. coastal counties ranged from 2.9 in Cook County, Michigan to 64,395 in Bronx County, New York. Density rates of over 10,000 people per square mile are common in the major urban areas located on the nation's shoreline. In sharp contrast to the high densities found in the nation's coastal zone, average population density in non-shoreline counties was only 52 persons per square mile in 1980.

Table 1.--U.S. shoreline county population growth and density by region: 1950 and 1980.

Region	Shoreline Population			State Pop. % Chg.	Shoreline Density	
	1950	1980	% Chg.		1950	1980
North Atlantic ^a	20,565,510	26,778,336	30			
South Atlantic ^b	2,956,209	8,218,143	178	33	652	849
Gulf	3,741,361	8,978,573	140	88	84	234
Pacific ^c	10,053,661	21,525,756	114	88	82	197
Great Lakes	15,113,280	18,193,093	20	110	139	298
Total ^d	52,430,021	83,693,901	60	28	223	269
				53	208	332

^aMaine through Maryland

^bVirginia through Florida

^cExcludes Alaska and Hawaii

^dTotal continental U.S. Population: 1950=150,197,567; 1980=225,010,218

CONSEQUENCES OF COASTAL POPULATION GROWTH

Land and water resources in the nation's coastal zone are finite. For every acre of land that has been developed for streets, parking lots, and buildings a corresponding acre of habitat has been lost. The rate at which this development has been occurring during the past 30 years become alarming (CEQ 1980).

Data from several studies summarized in a federal interagency task force report, Our Nation's Wetlands, issued in 1979 suggests that approximately one-third of the original wetlands in the contiguous 48 states have been converted to marinas, vacation homes and lots, airports, industrial plants, parking lots, highways and other uses (ITF 1979). Wetland loss has been reflected in declining production of commercial and recreational finfish and shellfish, waterfowl, and hardwoods; habitat for diverse wild plants and animals; filtration of pollutants from surface waters; and dissipation of flood waters. Recent increases in federal and state regulatory efforts directed at coastal development have abated, to some degree, the downward trend in wetland resources. However, the equally serious problem of disposing of waste products resulting from human habitation of the coastal margins has been growing.

There has been a natural tendency to regard the oceans (much like rivers) as a convenient, limitless receptacle for wastes. Raw sewage and the sludge that remains after treatment are dumped in our bays, estuaries, and oceans daily. Spoils from the dredging of harbors, canals, and waterways often contain heavy metals, persistent organic chemicals, and other chemicals are also being dumped in vast quantities. Low-level radioactive materials and tanker oil spills are providing new and more serious threats to coastal environments and resources (CEQ 1980). Recently, there has been a number of national policies and international agreements that are beginning to regulate the volume and types of wastes dumped in the oceans, but as problems of waste disposal on land multiply, pressures to use the oceans as a dumping ground will become stronger.

Table 2 summarizes the type and volume of several waste materials dumped in U.S. ocean waters during 1973 and 1979. As seen from the table, significant declines in industrial and construction wastes occurred over the period. Dumping of sewage sludge, solid wastes, incinerated wood, dredge materials, and low-level radioactive materials all increased markedly. Further impacting coastal resources was a six-fold increase in tanker oil spills. As a result of ocean dumping, inadequate sewage treatment, and non-point source pollution such as agricultural runoff, over 30 percent of all U.S. shellfishing areas are annually closed to harvesting and another 20-30 percent are temporarily closed for varying periods throughout the year (CEQ 1980).

Table 2.--Ocean disposal of wastes, 1973 and 1979.

Type of Waste	1973 Level	1979 Level
Ocean Disposal of Wastes		
Industrial	5,050,800T	2,577,000T
Sewage sludge	4,808,900T	5,932,000T
Construction & Demolition	973,700T	107,000T
Solid Wastes	240T	998T
Incinerated Wood	10,800T	36,000T
Dredged Material	67.2M cu. yds.	72.8M cu. yds.
Low-Level Radioactive	4,350T	5,400T
Tanker Oil Spills	123,000LT	724,000LT

T = Tons

LT = Long Tons

M.Cu. Yds. = Million Cubic Yards

Source: CEQ 1980

Recreation and tourism activities in the nation's coastal zone are dependent upon coastal resources. Oil-free beaches, abundant finfish and shellfish, abundant and diverse aquatic and terrestrial vegetation, and clean water are all necessary for the support of and long term viability of recreational and tourism industries. However, these industries themselves often contribute to declines in the availability and quality of resources for recreation. Examples of this include the development of shorefront property for second homes, marinas, hotels, private campgrounds and other commercial development. These activities contribute to public beach access problems (Fawcett et al. 1979). Currently, only 1,200 miles of our nations' 21,700 miles of oceans and Great Lakes shorelines is available for public recreation (CENR 1978). Public ownership of shoreline property has diminished considerably over the past several decades. Continued declines in the amount and quality of physical and environmental resources in the coastal zone will result in reduced or lost recreational benefits to the individual and society (CENR 1978).

CONCLUSIONS

The nation's coastal resources play host to numerous recreational activities. Millions of people annually fish, hunt, boat, swim, dive, surf and sun themselves,

among many other activities, in the coastal zone. With the exception of the Fish and Wildlife Service's national hunting and fishing survey reports, it is early impossible to determine the amount and nature of participation in the above activities that occurs in the coastal zone. We can anticipate that the demand for these types of recreational opportunities will keep pace with or exceed coastal population growth rates. Current resource degradation problems and land and water use conflicts associated with supporting the coastal population will not easily be remedied. Continued planning and management of coastal resources will be necessary to insure that adequate recreational access is available, that the integrity of coastal resources is maintained or improved, and that other constraints on coastal recreation participation are reduced.

LITERATURE CITED

- Christi, F.T. 1976. Allocation problems of marine recreation. In Recreation-Marine Promise. p. 62-68. Los Angeles, CA: University of Southern California, Sea Grant Program (USC-SG-3-76).
- Commission on Marine Science, Engineering, and Resources (CMSER). 1969. Our Nation and the Sea. 305 p. Washington, D.C.: U.S. Government Printing Office.
- Committee on Energy and Natural Resources (CENR), United States Senate. 1978. Past federal surveys of shoreline recreation potential. Washington, D.C.: U.S. Government Printing Office.
- Council on Environmental Quality (CEQ). 1980. Environmental Quality, 686 p. Washington, D.C.: U.S. Government Printing Office.
- Ditton, R.B. and Stephens, M. 1976. Coastal Recreation: A Handbook for Planners and Managers, 148 p. Washington, D.C.: NOAA, Office of Coastal Zone Management.
- Ehrlich, P.R. and Ehrlich, A.H. 1970. Population, Resources, Environment: Issues in Human Ecology. 383 p. San Francisco, CA: W.H. Freeman.
- Fawcett, J.A., Manus, A.T. and Sorensen, J.C. 1979. Recreational Access to the Coastal Zone, 155 p. Los Angeles: University of Southern California Marine Advisory Service.
- Interagency Task Force. 1979. Our Nations Wetlands. 282 p. Washington, D.C.: U.S. Government Printing Office.
- Ketchum, B.H. 1972. The Water's Edge: Critical Problems of the Coastal Zone, 392 p. Cambridge, MA: MIT Press.
- United States Department of Commerce (USCOC). 1983. Statistical Abstract of the United States: 1983, 1032 p. Washington, D.C.: U.S. Government Printing Office.

RECREATION AND TOURISM IN THE COASTAL ZONE

Joseph D. Fridgen

Abstract.--Direct indicators of recreation and tourism in the coastal zone are limited. General analyses of recreation and travel have not singled out the coastal zone as a variable of study. Based upon direct and indirect indicators, recreational use of the coastal zone will continue to increase. Boating and saltwater fishing have shown modest gains in line with population growth. The trend to convert city harbors from traditional marine industries to recreation, boating, and shopping purposes will continue. Despite several years of Sea Grant and Coastal Zone Management studies, a comparable data base for monitoring use of the U.S. coastal zone is lacking.

Additional keywords: coastal tourism, leisure, marine recreation, tourism indicators, coastal travel.

INTRODUCTION

Leisure travel, be it recreational outings or tourism in the classical sense, represents a growing economic influence, social and environmental concern. For the U.S., estimates of the total economic benefits associated with recreation, travel and tourism range from \$200 to \$250 billion dollars (Godbey 1982). Individual states across the Union are increasing their tourism and recreation research budgets (e.g., Perdue & Perdue 1983). Opinion polls (e.g., Harris 1984) and national recreation and leisure surveys focus upon diverse aspects of leisure, travel and recreation (e.g. The Miller Lite Report on American Attitudes Toward Sports 1983) shedding light upon how Americans spend their time and discretionary dollars. More is being understood about leisure and tourism behavior in general which is a promising indication of a growing maturity in the field. The reality of the second Outdoor Recreation Trends Symposium confirms the importance of such research.

Unfortunately, only a small proportion of our knowledge and data pertains to the use of the coastal zone. It appears that those tracking and monitoring tourism, leisure and recreation rarely focus upon activity within the coastal zone. Seldom is the coast a dependent or independent variable. Single studies of particular issues or settings in the coastal zone have been exceptions and they are typically spawned by Sea Grant funding or research associated with the mandates and opportunities of the Coastal Zone Management Act of 1972.

As an example, in the 1984-1985 time period, two important sources of trend data for the recreation and tourism field were published, yet a reviewer is hard pressed to locate more than a select few direct or indirect indicators of recreation or travel activity in the coastal zone (Clawson and Van Doren 1984; Goeldner and Duea 1984). Basically, the data that is useful for clean, trend analyses are not available. The researcher has to extract information

from varied sources, most of which are not organized with the coast as a variable of analysis (e.g., boat sales and use). Furthermore, the Great Lakes are not included in the analysis or inventory in many cases (Ringold and Clark 1980).

The result of such omissions means that it is difficult to chart the shifts in interest, attendance, development and expenditures associated with the U.S. coastal zone. This paper will present a brief overview of the limited data available, discuss problems of and potential solutions to data availability and "speculate" on future trends in the coastal zone.

TRENDS AND COASTAL RECREATION AND TOURISM

Ditton, in 1979, some six years ago questioned out loud when we would "get serious" about coastal preservation for a range of recreational activities and opportunities. Underlying his charge to those involved with coastal zone management, coastal tourism and recreation is the assumption that systematic analyses of new and existing data would be available for those studying how, why and when coastal resources are being used.

Even before that paper, Ditton and Stephens (1976) noted that since coastal research and recreation study in general were fairly new, recent emerging trends under study in recreation were not appropriate to the coastal zone (p. 1-14). The data available at that time rarely focused upon the coastal zone. As they noted, "there is a need to develop trends relevant to coastal zone use" (p. 1-6). Since then the research state of affairs is better, but comparable research studies are few. A checkered mosaic of research is available from scientists in states with active Sea Grant, Coastal Zone Management, natural resources or tourism funding, but it is difficult to extract national trends from isolated single studies. One of the apparent trends in all of this is that there is a drop in funding levels for recreation and tourism work in Sea Grant and in the Coastal Zone Management program. Such a trend appears to be due to reduced Federal funding and shifting priorities (Schuler 1982; Murray 1983).

The lack of trend data and analyses has serious implications for several coastal clientele groups, from beach users to marina managers. For marina operators to make financial cases before local bankers; for state and regional recreation associations to make preservation cases before their legislators; and for national recreation groups to persuade the U.S. Congress to direct attention toward the coastal zone, long-term trend data and analyses are required. But even today, financial consultants and recreation groups would have to search for trends to use in forecasting future use, demand or preferences relevant to the coastal zone.

The pressure for access (Ditton 1979; Robinson 1979) and the increases in travel and recreation generally (Godbey 1982; Van Doren 1984a; Goeldner and Duea 1984) assumes a continuing need to not only monitor, but to better understand and predict preferences, use, and expenditures in the coastal zone.

PROBLEMS IN REVEALING TRENDS IN THE COASTAL ZONE

When a researcher, planner, ecologist or marine biologist speaks the word "coastal", each has a unique biological, social and geographical location in

mind. Unlike camping equipment sales, keeping track of coastal use is variable across regions and jurisdictions. Coastal plans, evaluations, travel and recreation use studies within the coastal zone cut across many government, planning and recreation agencies. These diverse agencies having different needs may not collect comparable data. While the Los Angeles city park system may monitor users at public beaches, other cities across the country may track attendance in a totally different manner, if at all. The monitoring methods used at public state beaches and National Park properties may be different as well. In sum, data is inconsistent across recreation agencies (e.g., Zapata and Ditton 1979; Hornback 1980).

It is difficult to speak of trends in coastal use because of the diverse physical, geographical and social character of the coastal zone in the U.S. The coasts of northern Oregon are different than the sandy beaches of Florida. Should bays and tributaries be included? Beyond physical and biological diversity, the geography of any coastal analysis may include or exclude the Great Lakes. Tracking trends without the Great Lakes leaves out a major coastal system which should not be ignored in terms of economic impact, boating, fishing, beach use, resort development and transportation. For example, in the state of Michigan each year, boating activity amounts to a \$1 billion dollar industry (Stynes, Brothers, Holecek and Verbyla 1983); also, fishing licenses issued in the Great Lakes states of Wisconsin, Minnesota, Michigan, Ohio, Indiana and Illinois accounted for 24% of the total (26.1 million) sold in the U.S. in 1978 (Clawson and Van Doren 1984). A good proportion of these expenditures and license sales involves use of the Great Lakes and its coastal bays. Considering that the Congress has included the Great Lakes in programs of research and planning (Sea Grant and Coastal Zone Management) it seems reasonable to include the Great Lakes in any trend analysis.

Another problem is the lack of generalizability (Ditton 1975). Studies of specific coastal issues are available in several states, but an exhaustive inventory of recreation resources in Oregon does not assist in forecasting activity in other states, especially dissimilar states. Furthermore, the inventory is rarely repeated or completed in the same way, so shifts in economic investment and development cannot be traced.

WHAT IS KNOWN?

Most reviews and analyses of coastal zone issues provide the physical data (miles of shoreline), speak of the complex jurisdictions governing the coast and then summarize data on the specific topic at hand. These include urban (Warren 1979; Cowey 1979) cultural (Miller 1983), and environmental perspectives (Vogt 1979) to mention a few examples. Comprehensive reviews of recreation and tourism in the coastal zone appear sporadically. Recent analyses include the works by Siehl (1977) and MacFarland (1978); the useful almanac by Ringold and Clark (1980) and a unique philosophical and literary review of the ocean and sea by Blomberg (1982). These studies along with the selected works of others provide the foundation of what little we know about leisure and travel in the coastal zone.

General Expenditures

Important to all is the question of economics within the coastal zone.

In 1972, The Workshop on Critical Problems of the Coastal Zone was designed to provide "a compilation and evaluation of available information to define the present status of this factual base" (Ketchum 1972, p. xi). The Workshop would provide "one step on the way to develop, improve, and refine both the factual information and the understanding needed for the wise and effective use of the coastal zone" (p. xi). The chapter on "Recreation and Aesthetics" prepared by Jameson, Ragotzke, Bader and Teal, suggests that in 1968 "an estimated 112 million people spent about \$14 billion seeking recreation in the coastal zone" (p. 84). They based their estimate upon the work of Winslow and Bigler (1969). Since then few estimates have been attempted. Rather, estimates of specific activities are reported for selected years and locations. For example, Siehl (1977) reports the estimates of Clark (1974) which are as follows: swimming in 1965 -- \$2.9 billion in expenditures; waterfowl hunting in 1970 -- \$250 million; skin diving in 1965 -- \$40 million; and fishing in 1970 -- \$1.2 billion. An aside will illustrate the problem of tracking the economic impact of recreation in the coastal zone. A study by Bell, Sorensen and Leeworthy (1982) in Florida found that tourists in Florida who participate in saltwater recreational fishing (approximately 10%) generate \$0.76 billion in direct expenditures. They estimate that the indirect and direct expenditures of tourists participating in saltwater fishing was nearly \$3.95 billion. The Florida findings illustrate that fishing in the coastal zone is big business. In Michigan the total sports fishing estimate is \$1.2 billion (Jester 1984). If yearly surveys and projections were available from all other states, a 1984 rough estimate could be compared to the Clark projection of 1974; however, such data is not available. Studies are in process in Indiana, Illinois and Michigan under the auspices of Sea Grant and the respective state Departments of Conservation or Natural Resources. In any case, it is safe to say that the expenditures associated with coastal activities have increased -- how much and to what level is more difficult to estimate. Pieces of the puzzle are revealed in the sections that follow.

Fishing -- People and Dollars

Recreational fishing is but one important reason for using the coastal zone. Fishing, as a sport, in absolute numbers has grown over the last twenty-five years. Ringold and Clark (1980) estimated that some 22 million anglers participated in saltwater fishing in 1975. Fishing participation has increased since then. A portion of this growth is due to population increases in the coastal states (Westphal 1984; see Table 1). Between 1955 and 1980, total fishing license sales have increased by 56%. The number of anglers participating has increased by 100%, but relevant to the coastal regions, is the 195% increase in anglers fishing in saltwater. Also, the percentage of all angling activity which is saltwater related has been increasing (nearly one third in 1980). All of the increases have tailored off in the late 70's as inflation and the economic recession took its toll on vacation travel. While these numbers have implications for saltwater coasts, it is more difficult to accurately estimate Great Lakes fishing, although the number of licenses sold in the Great Lakes region excluding Pennsylvania and New York in 1978 was 6.26 million licenses. A sizeable proportion of these anglers use the Great Lakes. In Michigan it is estimated that 59% of the license holders fish the Great Lakes (Mahoney, Jester and Kikuchi 1984).

Table 1.--Fishing license sales, saltwater and total angler participation

Year	Total U.S. paid license holders (millions)	Total ^(a) angling participation (millions)	Saltwater ^(a) participation (millions)	Saltwater % of total (%)
1955	18.8	20.8	4.5	21.6
1960	19.1	25.3	6.3	24.9
1965	20.5	28.3	8.3	29.3
1970	24.4	33.1	9.5	28.7
1975	27.5	41.3	13.7	33.2
1980	29.3	41.8	13.3	31.8
<u>% change</u> 1955-1980	55.8%	100%	195%	---

Source: Westphal, J.M. (1984); Westphal's interpretation of U.S. Fish and Wildlife Service surveys and various years and selected data from the Statistical Abstract of the United States; tables 78 and 82.

(a) Anglers who spent more than \$15 on fishing or fished more than 3 days last year.

Saltwater fishing related expenditures have been increasing as well, ranging from about \$488 million in 1955 to \$3.6 billion in 1980 (Westphal 1984). These estimates are probably conservative. Ringold and Clark (1980) estimate that \$4.5 billion was spent in 1975. The Great Lakes are not included and a recent analysis of the saltwater sports angler in Florida in 1980-81 suggests that the direct expenditures in that state alone was \$1.87 billion (Bell, Sorensen and Leeworthy 1982).

The future is more difficult to predict. Fishing has traditionally been related to the age and sex of the participants. The troubled economic times have slowed growth in coastal fishing and as the U.S. population matures, participation in sport fishing may stabilize in the years ahead. Critical to the Great Lakes salmonid industry and shellfish resources around the U.S. is the potential threat of chemical contamination of the fishery. The Great Lakes fishery has been quite successful (Jester 1984; Brown 1982a, 1982b), but water quality must be a long term concern for the Great Lakes states as it has been for many saltwater coastal areas with shellfish resources (e.g., Heikoff 1983).

General Recreation

It has been ten years since Ditton (1975) spoke to the issue of "coastal recreation research" and the resultant data and information about use of the coastal zone. It is useful to paraphrase the main points he made at the

National Conference on Marine Recreation. He noted that:

- a) Coastal recreation is not the beach, fish or parks, but rather it is experiential, comprised of experiences and satisfactions.
- b) Most research has focused upon boating and fishing; studies in other areas (swimming, beach use, etc.) have been scarce and difficult to fund.
- c) State by state marina economics and fishing economics is a common research theme. What of more generalizable, national studies of coastal recreation?
- d) Research cooperation with state and local agencies in the recreation area is lacking but needed -- maybe cooperation with such agencies would foster systematic data collection of baseline data or coastal zone recreation activity.
- e) Private interests and corporations should be included in coastal research. More "confidential" information should be made available for coastal recreation analysis.
- f) Coastal recreation literature should be cumulative; ongoing research should build on past studies.
- g) More research should focus upon the people side of coastal recreation as well as the physical and biological.
- h) Modeling and systems research should wait until the baseline data is in. Little such data is available.
- i) Researchers should strive for uniformity among studies, data collection procedures and research variables -- comparable work should be conducted.
- j) Coastal recreation researchers should meet at the national level to discuss the above issues and concerns.
- k) Journal articles should follow from coastal recreation research; reports are difficult to access by national researchers. (Ditton 1975:122-124).

Since Ditton's paper the record is mixed. More journal articles are appearing, coastal recreation research has received modest attention from national funding programs, and state and local agencies have taken note of and appreciated the efforts of recreation researchers. But, a systematic analysis and development of a national data base to use in tracking the ups and downs of user activity in the coastal zone is still lacking. As mentioned above, the latest recreation and tourism statistics shed little light on the coastal zone. Even Ringold and Clark (1980) in The Coastal Almanac -- a publication to celebrate "1980 - The Year of the Coast" had to make large assumptions and could offer only one table on coastal boating, swimming and water-skiing (p. 142). Fishing is somewhat better with the availability of national

surveys and license data (Westphal 1984), although the license data is difficult to interpret and does not reflect saltwater uses or selected types of coastal fishing in certain states.

Boating has received selected state by state attention (e.g., Milon, Mulkey, Riddle and Wilkowske 1983; Heatwole and West 1981), but still it is difficult to differentiate or estimate coastal vs. inland boating activity. In the case of Michigan, Stynes and Safronoff (1982) found that 32% of Michigan's boatedays in 1980 were on the Great Lakes. Boating is susceptible to economic and inflationary pressure (Doyle 1975; Fletcher 1984). Boats and boat motor sales have declined in recent years, but a number of other indicators across the U.S. have been increasing (Table 2) -- boats in use (4.0% average annual increase, 1975-1982); boat registration (3.8% average annual increase, 1975-1982); and sailboats in use (4.3% average annual increase, 1975-1982; Fletcher 1984). In 1975 there were 9.74 million boats in use; in 1982 it is estimated that 12.9 million boats were in use with 61 million people participating in the sport. The percentage of these that utilize the Great Lakes

Table 2.--U.S. boats in use, registered and boating participation

Year	Boats in use (million)	Total boats registered (million)	Persons participating (million)	Sailboats (thousand)
1965	7.9	3.8	39.3	535
1975	9.7	6.8	48.7	800
1976	10.1	7.3	50.5	825
1977	10.5	7.7	52.6	840
1978	11.3	7.9	56.4	880
1979	11.6	8.0	58.1	904
1980	11.8	8.3	60.2	965
1981	12.5	8.3	60.7	1,030
1982	12.9	8.9	61.0	1,075
Average annual % change				
1975 to 1982	4.04%	3.88%	3.28%	4.32%
% change				
1965-1975	22.8%	78.9%	23.9%	49.5%
1975-1980	21.6%	22.0%	23.6%	20.6%
1980-1982	9.3%	6.7%	1.3%	11.4%

Source: Fletcher, J.E. 1984. Fletcher's use of data drawn from Marex, Marketing Services Department, Boating: A statistical report on America's top family sport, 1959-1980. Chicago, Illinois.

and coastal waters is surely sizeable. With continued, good, economic times these trends should continue since boating increases with age, the number of families and older families in the life cycle (Marmo 1980; Stynes and Safronoff 1982). As the "baby boom" matures and increasing discretionary income and free time become available, boating trends should be positive in the late 80's and 90's. This also means the pressure upon coastal facilities and waterways should continue generating environmental concerns as well as equity and access issues (e.g., Symonds 1979).

Another indicator of coastal activity is the sale of sports equipment, especially skin diving equipment since the majority of skin diving would occur in the coastal zone. Between 1974 and 1981, sales of such equipment have remained near \$70 million dollars per year (Van Doren 1984a). Other more popular sports equipment would be useful to track coastal activity but, allocating these expenditures to the coast is nearly impossible; although fishing tackle sales do reflect the increase seen in fishing activity and boating (Van Doren 1984a).

National and State Park Use in the Coastal Zone

The previous section outlined the little that is known about specific activities related to the coastal zone. Unable to chart specific coastal activities, general indicators are available through State and Federal records. National Park attendance at coastal facilities serves such a purpose. Ringold and Clark (1980) report that use of National Parks on the coasts increased on the average of 6.5% per year between 1970 and 1978 with over 65 million visitors in 1978. Their figures do not include the Great Lakes National Park properties. Including the Great Lakes National Parks and Lake shores along with other selected National Park sites, the percent change in use, year to year, can be seen in Table 3. In 1976, coastal National Park use was approximately 55.8 million, in 1978, 67.2 million and in 1983, 74.6 million (a 34% increase). On average, the yearly change in attendance was 3.8%. Like boating sales, the effects of the 1979-1982 energy crisis and recessionary period reduced attendance, especially among coastal parks (Table 3). It also appears that the decrease in attendance was most noticeable at facilities located in the major coastal states (such as California, Texas, and New York). It could be that the recovery in attendance seen in 1981 and 1982 following the recession could not be sustained in these coastal states due to the strong U.S. dollar and its resultant impact upon foreign travel to these states. Coastal National Park system use remains about 30% of the overall use and shows signs of slow growth if present trends continue.

In addition, it would be useful to monitor the attendance at State Parks located in the coastal zone. The data from State Park systems are seldom analyzed in such a way, but in combination with national, county and city park statistics which differentiate coastal properties, it would be possible to "pull back the darkness" which conceals how many tourists and visitors use the U.S. coastal zone via the public estate. Michigan State parks can be used as an example (Table 4). Attendance at Michigan's coastal State Parks is close to 50% of the total use of the system, higher than the 30% seen in the National Park system (Table 3). For the ten year period, 1960-70, use in the coastal parks only increased by 2.1% while use of the whole system grew by 13.2%. It should be noted that in the middle years of this period, general

Table 3.--National Park system attendance and coastal National Park property attendance 1976-1983

Year	NPS total attendance (million)	Coastal ^(a) attendance (million)	% coastal of total attendance	Year	% annual NPS change	% annual coastal change
1976	216.5	55.8	25.8%			
1977	210.6	61.0	29.0	76-77	-2.8	8.6
1978	222.2	67.2	30.2	77-78	5.3	9.2
1979	205.4	65.9	32.1	78-79	-8.2	-2.0
1980	220.5	73.4	33.3	79-80	6.8	10.2
1981	238.6	79.2	33.2	80-81	7.6	7.4
1982	244.9	80.5	32.9	81-82	2.6	1.5
1983	243.6	74.6	30.6	82-83	-0.5	-7.9
<u>% change</u>						
1976-1983	12.5%	33.7%	--	--	--	--

Source: Data drawn from -- National Park Statistical Abstract, various years; Ringold and Clark 1980; Van Doren 1984b.

(a) Coastal sites included NPS properties (53) located in the Great Lakes states and along the coasts of coastal states.

use of the Michigan State Park system declined, with 1970 being a recovery year. In contrast, between 1970 and 1980, coastal use grew by 15.5%, while overall system attendance grew by only 1.5% -- a reversal in growth patterns. This growth in attendance at coastal parks in the last ten years could be related to improved facilities, tourism development, a growing Great Lakes fishery and improved Great Lakes water quality. Attendance at coastal State Parks as a percentage of total attendance has been growing since 1970, from about 47% in 1970 to 52% in 1983 -- another indicator of the growing popularity of the coastal zone in the Great Lakes basin. These figures suggest that use of Michigan's coastal State Parks is growing in concert with the growth of the system as a whole. At the management level, the popularity of many Lake Michigan State Parks is very apparent. Several parks are over-used, with annual attendance approaching or going beyond one million visitors per year.

It would be useful to have this type of data from across the U.S. coastal states. Including the Great Lakes states, there are 30 coastal states. If the directors of these 30 State Park systems could be persuaded to break down their annual attendance into coastal and inland parks, a source of monitoring and tracking coastal use could be developed. One possibility would be for these states to include this breakdown in their annual report along with other standard statistics. This information would be an important addition to recent publications such as Clawson and Van Doren (1984) and Goeldner and Dueda (1984). The problem is a lack of incentives for agencies to keep records

Table 4.--Michigan State Park attendance across the system and in coastal parks: 1960-1983

Year	Michigan State Park attendance (million)	Coastal Park attendance (million)	Coastal as % of total (%)
1960	18.1	9.5	52.5
1963	13.6	6.3	46.3
1965	13.6	6.4	47.0
1968	17.7	8.6	48.6
1970	20.5	9.7	47.3
1974	19.5	9.6	49.2
1975	20.4	9.7	47.5
1978	23.6	12.3	52.1
1980	20.8	11.2	53.8
1983	23.0	12.0	52.2
<u>% change</u>			
1960-1970	13.2%	2.1%	
1970-1980	1.5%	15.5%	
1980-1983	-2.5%	7.1%	

Source: Michigan State Parks Division -- annual attendance data.

in this manner. To reflect back upon Ditton's comments about agency and researcher cooperation, while cooperation may have occurred in the ten years past -- and it has -- the result has not been an incentive for gathering statistics solely related to the coastal zone.

Looking ahead this may change. The need for data to support private investment and coastal planning decisions may facilitate coastal record keeping efforts. A host of diverse interests are making it important for accurate, up-to-date records to be kept on coastal zone use and attendance. Decreasing public funds require agencies to justify their expenditures and the value of their resources to legislative bodies. To do so agencies need accurate estimates of use, type of use and user behavior as well as physical and biological data (e.g., Raphael and Jaworski 1979). Business ventures must also plot the potential use and valuation of coastal resources -- the data becomes invaluable to tourism and commercial recreation businesses that seek loans and financial backing for development which is water or coastal dependent (e.g., Mulkey, Hackett and Gordon 1982; Bell, Sorensen and Leeworthy 1982). Also, as the coast becomes more of a target for development, energy exploration and mining, the costs and benefits cannot be estimated without a proper assessment of the users and potential users of the resource. From oil exploitation of the Outer Continental Shelf (Wilman 1979); aesthetic impacts upon boaters and

tourists (Wohlwill 1982; Carls 1979); snagging salmon along the Great Lakes (Stoffle, Rasch and Jensen 1983; Mahoney 1984); to the resultant impacts of toxic contamination of coastal waters and fisheries, the full consequences cannot be evaluated without data on the tourist, resident and local visitor. The first step is to gather the absolute number of tourists, residents and local visitors to the shorelines of America.

CONCLUSIONS

Sadly, the data and analyses needed to track coastal recreation and tourism is still lacking at the national level. Sea Grant funded efforts and Coastal Zone Management studies have provided assorted pieces of the puzzle, but taken together these studies often lack generalizability to other states, coastal situations and the established literature. As state and federal funding diminishes and weakens, or destroys Sea Grant and the Coastal Zone Management mandates, it is difficult to imagine a source of impetus for coastal research in the years ahead. In any case, a few points are worth stating.

- 1) General use of the coastal zone will continue to increase in concert with coastal population growth, generating continuing pressure upon the resource.
- 2) Concomitant with attendance is development. The renovation of harbors, waterfronts and beach property in the coastal and Great Lakes states will continue (e.g., Miami, San Francisco, Detroit, etc.). In many harbors, renovation includes the conversion of traditional harbor businesses into recreational uses (Johnson and Metzger 1983).
- 3) The economic, social and environmental significance of the coastal zone will have to be and will be measured more precisely in the years ahead. Recreation researchers will contribute to this trend of data collection, evaluation and valuation. Importantly, other agents with financial and policy interests will also participate and these include: oil, gas and mining interests; state and federal agencies such as State Parks, fishery divisions, public health agencies, banking and financing agencies; and representatives of private industry, particularly "leisure industries" such as hotel chains, boat and fishing equipment manufacturers and the producers and distributors of leisure and recreation accessories.
- 4) Fishing participation across the country is at best stable. Saltwater fishing may grow as the U.S. population matures and utilizes increasing discretionary dollars for coastal vacations.
- 5) Participation in boating should continue to grow in the coastal zone with a maturing U.S. population and increasing income.

These few points outline some of what is known and selected "expectations." A potential data base is possible, if attendance at State Parks and National Parks can be monitored. Also, the private sector -- hotels and commercial developments could be incorporated in a yearly monitoring study, much like the annual national ski studies, if the funds and interest were available. Unfortunately, the ground work for such an undertaking has not been

prepared. It seems appropriate in the years ahead to look to state and federal secondary data sources for insight on coastal activity trends. Examples beyond parks include coastal county tax and employment records (e.g., Brown 1982a) and development permits in coastal counties to mention but a select few. Finally, the scattered studies already conducted and available need to be reviewed and made a part of the national literature on recreation and tourism.

ACKNOWLEDGEMENTS

Thanks are extended to Jennifer Dively and Jeff Silagy for their assistance with analysis of the National Parks and State Parks data. I appreciate the clerical assistance of Bettye Warren. This paper was supported by the College of Agriculture and Natural Resources, Agricultural Experiment Station, Project #1436-H "Psychology of Recreation and Tourism: People and Resources."

LITERATURE CITED

- Bell, F.W., Sorensen, P.E., and Leeworthy, V.R. 1982. The economic impact and valuation of saltwater recreational fisheries in Florida. Sea Grant Report #47, 118 p. Florida Sea Grant College, Florida State Univ., Tallahassee, FL.
- Blomberg, G.D. 1982. Coastal amenities and values: Some pervasive perceptions expressed in literature. Coastal Zone Management Jour. 10: 53-77.
- Brown, T.L. 1982. Regional economics of Michigan's salmonid program: Does a \$20 million fishery really make a difference? In J.D. Fridgen and D.J. Allen (eds.) Michigan tourism: How can research help? p. 125-128. Symp. Proc. Special Report #6, Agr. Exp. Sta., Mich. State Univ., E. Lansing.(a)
- Brown, T.L. 1982. A valuation of New York's Great Lakes sport fisheries. First Impression Paper Series, #NYSGI-T-82-005, 24 p. New York Sea Grant Institute, Albany, NY.(b)
- Carls, E.G. 1979. Coastal recreation: Esthetics and ethics. Coastal Zone Management Jour. 5: 119-130.
- Clark, J. 1974. Marine recreation: A literature review and status report. Environmental Guidance Group. Study for NOAA: Washington, D.C. (Reference and data as reported by Siehl, G. 1977. Recreation and the Coastal Zone. Congressional Research Service, Washington, DC.)
- Clawson, M., and Van Doren, C.S. (eds.). 1984. Statistics on outdoor recreation. 368 p. Washington, DC: Resources for the Future, Inc.
- Cowey, A.B. 1979. The urban coast from a national perspective. Coastal Zone Management Jour. 6: 135-165.
- Ditton, R.B. 1979. Ocean access - Another view. Coastal Zone Management Jour. 5: 1-4.

- Ditton, R.B. 1975. Coastal recreation research: A past, present and future perspective. In S.H. Anderson (ed.) Recreation - Marine promise. Proc., discussion, and overview of National Conf. on Marine Recreation, p. 120-125. Sea Grant Rep. USC-SG-3-76. Univ. of Southern Calif.
- Ditton, R.B., and Stephens, M. 1976. Coastal recreation: A handbook for planners and managers. PB-270708. Washington, DC.: National Oceanic and Atmospheric Administration.
- Doyle, P. 1975. Impact of the recession on the recreational marine industry. In S.H. Anderson (ed.) Recreation - Marine promise. Proc., discussion, and overview of the National Conf. on Marine Recreation, p. 103-110. Sea Grant Rep. USC-SG-3-76. Univ. of Southern Calif.
- Fletcher, J.E. 1984. Sales of boats, motors, and trailers as an index to water based recreation. In M. Clawson and C.S. Van Doren (eds.) Statistics on outdoor recreation, p. 258-262. Washington, DC.: Resources for the Future, Inc.
- Godbey, G. 1982. Demand for recreation in America: An overview. 29 p. Alexandria, VA: National Recreation and Park Association.
- Goeldner, C.R., and Duea, K.P. 1984. Travel trends in the United States and Canada. 262 p. Boulder, CO: Business Research Div., Univ. of Colorado.
- Harris, L. 1984. Men enjoy more leisure than women. U.S.A. Today: Dec. 4; Louis Harris poll commissioned by Philip Morris, Inc.
- Heatwole, C.A., and West, N.C. 1981. Storage characteristics of New York City's recreational fleet. In C.J. Smith (ed.) Proc. of the middle states division, Assoc. of Am. Geographers, p. 32-36. Vol. 15, Rochester, NY.
- Heikoff, J.M. 1983. Management of the ocean shore of New York state: Rochaway Point to Montauk Point. First Impression Paper Series, #NYSGI-T-83-005, 51 p. New York Sea Grant Institute, Albany, NY.
- Hornback, K.E. 1980. The trend of measuring public use of the National Parks. In Proceedings - 1980 National outdoor recreation trends symposium, Vol. 1, p. 233-241. USDA Forest Serv. Gen. Tech. Rep. NE-57. Northeastern Forest Exp. Sta., Broomall, PA.
- Jameson, D.L., Ragotzkie, R.A., Bader, R.G., and Teal, J.M. 1972. Recreation and aesthetics. In B.H. Ketchum (ed.) The water's edge: Critical problems of the coastal zone, p. 84-102. Cambridge, MA: MIT Press.
- Jester, D. 1984. News release to Frank Mainville, outdoor editor, Lansing State Journal, Sept. 16. Data appeared in Mainville Outdoors column.
- Johnson, J.C., and Metzger, D. 1983. The shift from technical to expressive use of small harbors: The "play-full" harbors of southern California. Coastal Zone Management Jour. 10: 429-441.

- Ketchum, B.H. (ed.). 1972. The water's edge: Critical problems of the coastal zone. 393 p. Cambridge, MA: MIT Press.
- MacFarland, J.W. 1978. Beach access, coastal islands, and recreational resources. *Shore and Beach* 46: 6-12.
- Mahoney, E. 1984. Salmon snagging in Michigan. Unpublished report, Park and Recreation Resources, Michigan State University, East Lansing, MI.
- Mahoney, E., Jester, D., and Kikuchi, H. 1984. Analysis of sports anglers in Michigan. Unpublished report, Park and Recreation Resources, Michigan State University, East Lansing, MI.
- Marmo, A.J. 1980. National boating trends. In Proceedings - 1980 National outdoor recreation trends symposium, Vol. 1, p. 135-145. USDA Forest Serv. Gen. Tech. Rep. NE-57. Northeastern Forest Exp. Sta., Broomall, PA.
- Miller Lite Report on American attitudes toward sports. 1983. 252 p. Milwaukee, WI: Miller Brewing Co.
- Miller, M.L. 1983. Culture, ethnography, and marine affairs. *Coastal Zone Management Jour.* 10:301-311.
- Milon, J.W., Mulkey, D., Riddle, P.H., and Wilkowske, G.H. 1983. Economic impact of marine recreational boating on the Florida economy. *Sea Grant Report #54*, 26 p. Florida Sea Grant College, Univ. of Florida, Gainesville, FL.
- Mulkey, D., Hackett, W.B., and Gordon, J.R. 1982. Assessing economic activity in coastal areas: A shift - share approach. *Coastal Zone Management Jour.* 10-79-96.
- Murray, T.E. 1983. Marine policy and social sciences in the National Sea Grant College Program - FY83. Rockville, MD: Office of Sea Grant, NOAA.
- Perdue, R.R., and Perdue, J.C. 1983. Patterns of change in state travel office budgets: 1971-1981. In Abstracts: 1983 Symp. on Leisure Research, p. 97. Alexandria, VA: National Recreation and Park Association.
- Raphael, C.N., and Jaworski, E. 1979. Economic value of fish, wildlife, and recreation in Michigan's coastal wetlands. *Coastal Zone Management Jour.* 5: 181-194.
- Ringold, P.L., and Clark, J. 1980. The coastal almanac. 172 p. San Francisco: W.H. Freeman & Co.
- Robinson, A.H. 1979. Planning considerations for preservation and use of the National Seashores. *Coastal Zone Management Jour.* 5: 5-34.
- Schuler, F.M. 1982. The National Sea Grant Program in marine recreation and tourism. 8 p. Rockville, MD: Office of Sea Grant, NOAA.

- Siehl, G.H. 1977. Recreation and the coastal zone. Research Paper 77-203EP GC20, 45 p. Congressional Research Service, Washington, DC.
- Stoffle, R.W., Rasch, D.L., and Jensen, F.V. 1983. Urban sports anglers and Lake Michigan fishery policies. Coastal Zone Management Jour. 10: 407-427.
- Stynes, D.J., Brothers, G.L., Holecek, D.F., and Verbyla, D. 1983. Spending patterns and economic impacts of Michigan registered boat owners. Sea Grant Report #MICHU-SG-83-210, 102 p. Michigan Sea Grant, Ann Arbor, MI.
- Stynes, D.J., and Safronoff, D. 1982. 1980 Michigan recreation boating survey. Sea Grant Report #MICHU-SG-82-202, 103 p. Michigan Sea Grant, Ann Arbor, MI.
- Symonds, P.J. 1979. Equity in coastal access: Income and spatial effects on the benefits of a new boat harbor in metropolitan Los Angeles. Coastal Zone Management Jour. 5: 83-106.
- Van Doren, C.S. 1984. Sport participation, sporting goods sales and recreation expenditures. In M. Clawson and C.S. Van Doren (eds.) Statistics in outdoor recreation, p. 288-296. Washington, DC: Resources for the Future, Inc.(a)
- Van Doren, C.S. 1984. The National Park System. In M. Clawson and C.S. Van Doren (eds.) Statistics on outdoor recreation, p. 169-188. Washington, DC: Resource for the Future, Inc.(b)
- Vogt, G. 1979. Adverse effects of recreation on sand dunes: A problem for coastal zone management. Coastal Zone Management Jour. 6: 37-68.
- Warren, F. 1979. The role of cities in managing the urban coast. Coastal Zone Management Jour. 6: 125-133.
- Westphal, J.M. 1984. Hunting and fishing. In M. Clawson and C.S. Van Doren (eds.) Statistics on outdoor recreation, p. 245-252. Washington, DC: Resources for the Future, Inc.
- Wilman, E.A. 1979. OCS development and commercial and recreational fishing. Coastal Zone Management Jour. 5: 211-230.
- Winslow, E., and Bigler, A.B. 1969. A new perspective on recreational use of the ocean. Undersea Technology 10: 51-55. (As quoted and referenced by Jameson, D.L., et al. In B.H. Ketchum (ed.) The water's edge: Critical problems of the coastal zone. Cambridge, MA: MIT Press.)
- Wohlwill, J.F. 1982. The visual impact of development on coastal zone areas. Coastal Zone Management Jour. 9: 225-248.
- Zapata, A., and Ditton, R.B. 1979. The status of boating information systems. Coastal Zone Management Jour. 6:99-107.

Walter F. Clark

Abstract

Protecting and enhancing access to our beaches is important in maintaining the recreational potential of our coastline. Legal tools are available to recreation planners and managers to help them achieve an adequate level of beach access. This article surveys these tools.

INTRODUCTION

Beaches are an important recreational resource in the United States. As more people move to our coastal areas and as Americans acquire more leisure time the recreational importance of our beaches will likely increase. However, the beach is a finite resource and as its use increases conflicts will occur. One inevitable conflict will center on access - the general public's ability to reach and legally use the beach.

A problem of insufficient public access has been recognized nationally for over twenty years. A comprehensive and well documented Congressionally commissioned study prepared in 1962, "Shoreline Recreational Resources in the United States," found that one of the major difficulties in the use of the shore was its availability.¹ Since the publication of that report 23 years ago, the access problem has been further recognized, documented and with a mixed degree of success, addressed. In many areas state and local planning activities now exist which focus directly on protecting and securing access. These activities often lead to the use of various legal devices which can range from making tax credits available for access donations to the establishment of easements through private property.

Recreation managers should be cognizant of the status of access in their areas and should be prepared to rectify deficiencies and meet future needs. To do this effectively will require an understanding of what access encompasses and what devices are available to protect and enhance it.

¹U. S. Outdoor Recreation Resources Review Commission, Shoreline Recreational Resource of the United States, Study Report No. 4 (1962).

WHAT IS ACCESS?

Access is the public's ability to use the beach. It encompasses the ability to: (1) reach the beach from inland sites, and (2) legally use the beach once it is reached.

As oceanfront building continues, new development may block beach accessways in many coastal areas. Private development between inland areas and the beach can effectively cut off the beach to all except those residing on oceanfront property. This raises both economic and equity issues.

Coastal businesses often depend on the large influx of tourists who come to the beach for the day or who stay in non-oceanfront units. If these tourists find the beach inaccessible, they may seek other outlets to meet their recreational needs. This could damage some aspects of the coastal economy.

The beach between the mean low tide and the mean high tide, the foreshore, belongs to the public in most coastal states.² In these states the public has rights, often referred to as public trust rights, to use the foreshore for general recreation purposes. Because these rights can only be exercised if the public can reach the beach, the issue of fairness should be considered when access is made difficult.

The second issue encompassed by the term "access" is the ability to legally use the beach. Most people think of the beach as the area beginning at the seaward side of the dunes (or vegetation line) and running to the low tide line. The public often takes it for granted that this entire area is available for their use. In reality, the public generally is legally entitled to use only the foreshore and not the beach above mean high tide. The dry sand is usually owned by the oceanfront property owner who might be able to exclude the public from that portion of the beach.

Below are legal tools that have been used to mediate access problems. They are divided under the two categories of (1) reaching the beach, and (2) using the beach.

²Maine and Massachusetts are two exceptions. In these states, title to the foreshore is vested in the private littoral (adjacent upland) owners subject to certain public rights. In Massachusetts there is no public right to walk upon the foreshore except for the specific purposes of fishing and fowling. Jeffrey D. Curtis, Coastal Recreation: Legal Methods for Securing Public Rights in the Seashore, Maine Law Review, 33:69-102 (1981).

REACHING THE BEACH

A variety of legal tools are used to protect and enhance the public's ability to reach the beach. Some tools involve voluntary measures while others involve compulsory administrative or judicial action.

Voluntary Measures

In North Carolina, the state legislature has created a voluntary incentive designed to encourage property owners, including oceanfront landowners, to donate land for public purposes.³ This new law provides for a state tax credit of twenty-five percent of the fair market value of a donated property interest.⁴ The property must be useful for public beach access, public access to public waters or trails, fish and wildlife conservation or other similar land conservation purposes. This incentive may act to encourage property owners to donate portions of their lots. For example, a cottage owner might donate an access alleyway from a public road through his or her property to the public's beach.

Voluntary incentives often work along with more compulsory regulatory requirements to encourage land donation. For example, the North Carolina Coastal Resources Commission requires setbacks for oceanfront construction based on an area's shoreline erosion rate.⁵ Because of shallow lot sizes and/or high erosion rates, some oceanfront properties are deemed unbuildable. Owners of these lots can gain a tax advantage by donating their land to the state for access purposes. The tax credit program is relatively new in North Carolina. Because of this infancy, its success as an incentive is yet unmeasured.

Federal tax benefits may also be gained through property donations. When a landowner gives property to a government entity, he or she is permitted to deduct the fair market value of the property from federal income taxes.

When a landowner decides to donate his property to an organization or governmental agency, it is the landowner's prerogative to include restrictions in the deed of transfer. Such restrictions can ensure that the land will be managed and used according to the donor's wishes. However, the government must accept the conditions attached to the grant.

³NCGS 105-130.34.

⁴The credit may not exceed \$5,000.

⁵The North Carolina Coastal Area Management Act (CAMA) of 1974 created a fifteen member commission to develop standards to ensure the orderly and balanced use and preservation of coastal resources. NCGS 113A-102.

Donors who place restrictive language in the deed should be aware that the restrictions will most likely have an effect on the fair market value of the property. Through restrictions, the donor is effectively retaining some rights, and these rights have value; thus, the value of the restrictions will be considered in any appraisal of the land.

One such restriction is commonly referred to as a "reverter" clause. By including a reverter clause in the deed, will, or other other instrument of transfer, the donor can specify that title to the land or interest in land conveyed will revert to its former owner or to a third party if it ceases to be used for the purposes defined in the instrument.

Another tool available to the recreation planner is the purchase of real property. However, since the government will often be competing with other potential buyers and since oceanfront property is expensive in general, this tool could be costly. This is particularly true for large tracts of buildable quality. Communities with a small tax base that do not have outside funding may find purchases of large tracts unreasonable.⁶ These communities may want to look at the feasibility of purchasing easements. An easement is the right to use someone's land in a specifically designated manner. Easements are generally purchased in circumstances in which it is unnecessary or infeasible to purchase the land itself, i.e., only some rights to use the land, such as the right to pass over it. A sale must be voluntary in the absence of the use of such tools as eminent domain. Landowners may be persuaded to grant easements because of the tax consequences involved, including a decrease in the valuation of their property for property tax purposes and their potential ability to avoid paying capital gains tax on the income derived from the sale of the easement.

Again, as is true with donations, compulsory regulatory requirements may encourage the sale of property. Owners of property which, because of regulatory standards, is labeled unbuildable will be more likely to sell and to sell at reasonable prices.

The recreational planner should always attempt to use non-compulsory tools in improving public access. There exist both private and public rights in our shorelines. Both sets of rights can best be protected if their security is obtained through voluntary measures.

Involuntary Measures

There will occasionally be situations where voluntary measures will not produce the desired results. The protection and enhancement of public access rights in these cases may require the use of compulsory measures. Some of these measures are briefly discussed below.

⁶In North Carolina, some outside funding is available to local communities through the state's coastal management program. For 1985 the North Carolina Office of Coastal Management requested \$250,000.00 from the state's legislature to aid in purchasing oceanfront and soundfront property.

There are times when a parcel of land is needed for access purposes and the property owner refuses to sell. In these situations a government can often exercise its power of eminent domain.⁷

Eminent domain is the process by which governmental entities acquire proprietary interests in privately held land in exchange for compensation, regardless of the owner's willingness to sell. A government entity can generally condemn whatever land it chooses so long as its actions are consistent with a public use or benefit. Compensation is fixed at fair market value.⁸ Because fair market value must be paid and because oceanfront property is expensive, the use of eminent domain can be costly, particularly when large tracts are needed.

A less expensive application of eminent domain is to condemn easements. In this case the title remains in private ownership but would be encumbered by the public easement for access purposes.

There are other tools available that can enhance access without using the power of eminent domain. A state legislature may pass a statute requiring an access easement in certain situations.⁹ For example, California requires that permits be obtained for most oceanfront development. As a condition to some of these permits, the state requires the developer to expressly dedicate an accessway through his or her property.¹⁰ Recreation planners should survey the permitting requirements of their states for indications of this type of regulation.

There are situations where the public, through traditional and long-term use of private property, gains access rights. At least two tools are available to help recreation planners secure these rights. The first, called implied dedication, arises in situations where the public has used private property for a long time, paying no attention to its private

⁷Some states specifically provide for the use of eminent domain for access acquisition. For example, Florida allows condemnation for access purposes under its Outdoor Recreation and Conservation Act. Fla. Stat. 375.031 (6) (1980 Supp.).

⁸David Brower, Access to the Nation's Beaches: Legal and Planning Perspectives, UNC Sea Grant Publication, UNC-SG-77-18 (1978).

⁹The Federal Coastal Zone Management Act of 1972 has been an indirect impetus behind the passage of some of this legislation. That law requires that state coastal management programs contain a planning process for beach access.

¹⁰California has a constitutional provision which guarantees beach access to all of its citizens. It can be argued that California draws on the provision in requiring express dedication.

ownership status.¹¹ An intent to give the land to the public is implied from the owner's conduct of not preventing his or her property from being used for access purposes. This is the creation of what is often termed a "legal fiction" because in most cases the landowner never actually intended to grant the public access rights.

The second tool is termed a prescriptive easement.¹² There are five requirements that must be satisfied before an access area can be acquired through a prescriptive easement. They are: (1) actual use of the property by the general public; (2) the use must be continuous and uninterrupted for a set period;¹³ (3) the use must be open and fully visible to the owner; (4) the user (the public) must be claiming a right to use the property; and (5) the use must be adverse to the property interests of the owner. If it is found that the public has acquired a prescriptive easement for the use of a specific access area, then the public has a right to continue to use the area in the same fashion as before. The owner still owns the property but cannot do anything on it that would reduce the public's established use rights.¹⁴

Reaching the public beach is becoming increasingly difficult. This brief discussion of some of the legal tools available to protect and enhance access will give recreation planners a starting point. Planners should investigate how these tools have been applied in their individual states.

USING THE BEACH

Getting to the beach is only the first of the two access problems. Knowing what part of the beach the public can legally use is another question.

Most people think of the beach as the area beginning at the seaward side of the dunes (or vegetation line) and running to the low tide line. The public often takes it for granted that this entire area is available for their use.

¹¹The following court cases have recognized implied dedication as an acceptable theory: Seaway v. Attorney General, 375 S.W. 2d 923 (Tex. Ct. Civ. App.) writ. ref'd n.r.e. (1964); Gion v. City of Santa Cruz, 465 P. 2d 50 (1970); Dietz v. King, 465 P. 2d 50 (1970).

¹²For case law utilizing this concept see City of Daytona Beach v. Tona-Rama, 271 So. 2d 765 (Fla. Ct. App. 1972).

¹³The length of the period will vary from state to state.

¹⁴David Brower, Access to the Nation's Beaches: Legal and Planning Perspectives, UNC Sea Grant Publication, UNC-SG-77-18 (1978).

In reality, in most states only the beach between mean low tide and mean high tide, the foreshore or wet sand beach, belongs to the public. The remainder of the beach, the dry sand area, is usually owned by the oceanfront property owner who might be able to exclude the public.

With the growing number of people competing for beach area, recreation planners should attempt to maximize the amount of beach available for public use. These attempts, as much as possible, should be compatible with existing private property rights. The ultimate goal is a proper balance of public and private rights. There are legal tools available that may help planners enhance beach use.

One of the most discussed tools or theories is the public trust doctrine. Under this doctrine the public has use rights in publicly owned properties.¹⁵ In most states the wet sand beaches are subject to public trust rights.¹⁶ In these states the public can use the wet sand beaches for general recreational purposes.

There have been attempts to expand public trust rights to cover the privately owned dry sand beach. The most notable attempts are exemplified in a set of New Jersey court cases.¹⁷ In the Matthews' case, cited below, the court expanded the public trust to cover municipally owned dry sand areas. The court stated that all members of the public, and not just citizens of the township owning the beach, have the right to exercise their public trust rights on the dry and wet sand beach.

The Matthews' court came close to extending the public trust to the privately owned dry sand beach. It held that "private land is not immune from a possible right of access to the foreshore for swimming and bathing purposes, nor is it immune from the possibility that some of the dry sand may be used by the public incidental to the right of bathing and swimming."

¹⁵Originally these rights were limited to navigation and fishing. Some states have expanded the rights to include general recreational use. Marks v. Whitney, 98 Cal. Rptr. 790, 491 P.2d 374 (1976). Matthews v. Bay Head Imp. Association, 95 N.J. 306, 471 A.2d 355 (1984).

¹⁶Approximately three-fourths of the oceanic states have held that the wet sand beaches are publicly owned. In most of these states the public beaches are subject to public trust rights. David Brower, Access to the Nation's Beaches: Legal and Planning Perspectives, UNC Sea Grant Publication, UNC-SG-77-18 (1978).

¹⁷Neptune City v. Avon-By-The-Sea, 61 N.J. 296, 294 A.2d 47 (1972). Matthews v. Bay Head Imp. Association, 95 N.J. 306, 471 A. 2d 355 (1984).

In recent years there has been a trend toward expanding the public trust doctrine. The courts, though close, have yet to expand the doctrine to the private dry sand beach area. Recreation planners should, however, be cognizant of the doctrine's potential.

Other tools which preserve or expand the use area of the beach may be found in state statutes. For example, Texas has a statute, called the Open Beaches act, which supports the public's right to use the beach from the mean low tide to the line of vegetation.¹⁸ The Act empowers the Texas Attorney General and other public attorneys to file law suits protecting the public's use rights.

Oregon also has a statute which clearly establishes the public's right to use the coast seaward of the vegetation line.¹⁹ The passage of this law was concurrent with an Oregon court case which not only gave judicial legitimacy to the act, but also applied a theory called "customary right" to beach usage.²⁰ The Oregon court stated that the public has rights in the privately owned dry sand beach based on custom. There are seven requirements that traditionally have to be met before it can be said that the public has a "customary right" to use a private beach. They are:²¹

- (1) The use must be "ancient", i.e., so long that nobody remembers otherwise;
- (2) The use must have been without interruption, which is to say the public must not have been excluded by the upland owner during this period;
- (3) The use must have been peaceable and free from dispute, the public entering and using the area without resort to force;
- (4) The use must have been reasonable and in keeping with the character of the land;
- (5) There must be certainty as to just what land was being used;
- (6) The use must have been obligatory for the upland landowner, that is, the public's use not being subject to the option of each individual upland owner; and
- (7) The use must not be repugnant or inconsistent with public policy and other laws.

¹⁸ Texas Natural Resources Code 61.020. "Line of Vegetation" is defined as the extreme boundary of natural vegetation which spreads continuously inland. Texas Natural Resources Code 61.001 (2).

¹⁹ Oregon Rev. Sect. 390.605 et seq. (1967).

²⁰ Thornton v. Hay 462 P.2d 617 (1969).

²¹ Thornton, 462 P. 2d at 677.

If all seven of these theories can be satisfied, a public customary right to use the dry sand beach can be established.

The tools discussed above have broad application. Under these theories the entire dry sand beach of a town, county or state can be made subject to public use. There will be times, however, when only a relatively small parcel of the beach is needed. Some of the tools discussed under "Reaching the Beach" (implied dedication, prescriptive easement, etc.) can be applied in these situations.

CONCLUSION

Increasing public beach access is important. This paper provides a very basic outline of the methods that have been used to protect and enhance both access to and use of the beach. Below are some additional considerations that should be studied before taking action.

Increasing public access can and should be coordinated with the use of private land. Any action taken should contain safeguards that make public access complimentary to private rights. For example, an easement through private property should be properly maintained so that it does not become an eyesore.

Select a tool based on the community's needs. Does the community need a series of easements or would it be better served by the outright ownership of a large public recreational area?

The planner should coordinate his or her activities with other agencies. Resources can often be maximized when various entities plan together. For example, an access area's parking needs might be satisfied by on-street parking -- an achievement which will likely require coordination between at least two agencies.

Finally, almost all of the tools discussed above are complicated. Each jurisdiction (state, county, town, etc.) is likely to have different statutes or regulations and legal interpretation. The assistance of trained legal counsel is important in successfully using any of these tools.

MARINE SPORT FISHING TRENDS

Norville S. Prosser

Abstract -- Sport fishing participation in marine waters continues to grow although at a declining rate of increase. An industry of significant proportions has developed to provide the goods and services demanded by the recreational fishing fraternity. Future growth of marine recreational fishing depends on greater awareness of the full range of values associated with recreational exploitation of limited fish stocks and more aggressive participation by the sport fishing fraternity in funding appropriate programs and in influencing policy decisions.

Trend analyses are difficult for most aspects of marine recreational fishing due to the imperfect nature of catch, effort, participation and socio-economic information upon which to base such analyses. Such data deficiencies have handicapped marine finfish management, and associated development of shore-based support facilities. Inadequate information has similarly constrained policy and allocation strategies of benefit to sport fishing participants and to the support industry.

Greater examination and attention is slowly being focussed on the recreational sector in many coastal areas and some important sport fishing-related measurements have recently become available for analysis. Participation statistics are among the longest term measurements available addressing marine sport fishing. Fewer data are available for harvest and activity-related expenditures. Some important policy trends (embryonic in some cases) can be discerned which, if developed, will ultimately benefit recreational users of marine fish stocks. A number of these "trends" are explored in the following discussion.

MEASUREMENTS OF MARINE RECREATIONAL FISHERY

Participation

Among Americans, fishing is by far the most popular outdoor activity that depends on a renewable natural resource base. In fact, in 1982, fishing ranked third in popularity among all participatory sporting activities being exceeded only by swimming and bicycling (Van Doren 1984). Nationwide participation statistics, which the U.S. Fish and Wildlife Service (FWS) began to gather at five year intervals beginning in 1955, indicate a substantial increase in the popularity of marine recreational angling. Fishing in marine waters represents a significant portion (approximately 17 percent) of total recreational fishing activity (trips taken). It is apparent from the quinquennial survey statistics that the steady rapid growth of marine sport fishing participation slowed significantly during the decade 1970-1980. Still, there were nearly three-times as many marine anglers in 1980 as there were in 1955 (table 1). The percent of the United States population that fishes in marine waters doubled from 3.9 percent in 1955 to 8.0 and 7.2 percent in 1975 and 1980, respectively. A 2.7 fold increase in angling days afield is apparent between 1955 and 1980.

What is it that attracts so many Americans to sport fishing? The American

public selects fishing as their third favorite form of outdoor recreational

Table 1. -- Angling participation by marine sport fishermen twelve years and older in the United States for the period 1955-1980

Measure of participation	Years					
	1955	1960	1965	1970	1975	1980
Number of marine fishermen (thousands) ^a	4,557	6,292	8,305	9,460	13,738	13,332
Percent of U.S. population	3.9	4.8	5.9	6.1	8.0	7.2
Number of days of sport fishing (thousands) ^a	58,621	80,602	95,837	113,694	167,499	160,678

^aData from U.S. Fish and Wildlife Service's 1980 National Survey of Fishing, Hunting and Wildlife-Associated Recreation.

pursuit for a number of reasons. According to surveys of socio-economic aspects of marine recreational fishing conducted by Hiett, et al (1983), "fish-associated" objectives such as "to catch fish" dominated the reasons offered by the study respondents for their participation in marine sport fishing. Furthermore, the factor most commonly associated with marine anglers' trip satisfaction was the number of fish caught. For certain, a wide array of "satisfactions" are inherent in a successful fishing trip in addition to catching fish for fun or food. This multiplicity of satisfactions is no less true for other outdoor recreational pursuits such as camping or swimming. The one distinct difference, or specialty, which distinguishes fishing from other water-associated recreational activities is the act, or the expectation, of catching fish.

Harvest

Most marine fish species are shared stocks, harvested by both commercial and recreational fishermen. However, the recreational catch of many species exceeds the commercial harvest. The marine sport fish catch was estimated by the National Marine Fisheries Service (NMFS) at approximately 700 million pounds of fish (live weight) in 1980 (Deuel 1981). There are indications that recreational fishermen account for approximately 50 percent of the total U.S. finfish harvest used for food (Deuel 1984).

The 1980 harvest figures show that the five most frequently occurring species (or complex of like species) in the harvest along each of the three United State's coasts comprised in excess of 50 percent of the respective recreational harvests (table 2).

Table 2. -- Species of greatest importance in the 1980 recreational sport fish harvest (by number) on the Pacific, Atlantic and Gulf coasts

Species	Total number (thousands)	Percentage of coastwide harvest
<u>Pacific coast</u> ^a		
Surf smelt (<u>Hypomesus pretiosus</u>)*	17,654	26.5
Rockfish, complex (<u>Sebastes</u> spp.)	14,821	22.2
Pacific mackerel (<u>Scomber japonicus</u>)	6,340	9.5
Surf perch, complex (<u>Embiotocidae</u>)	4,006	6.0
White croaker (<u>Genyonemus lineatus</u>)	3,795	5.7
<u>Atlantic</u> ^b		
Bluefish (<u>Pomatomus saltatrix</u>)	37,482	17.6
Summer flounder (<u>Paralichthys dentatus</u>)	22,226	10.5
Spot (<u>Leiostomus xanthurus</u>)	20,270	9.5
Silver hake (<u>Merluccius bilinearis</u>)	15,940	7.5
Winter flounder (<u>Pseudopleuronectes americanus</u>)	15,378	7.2
<u>Gulf</u> ^b		
Atlantic croaker (<u>Micropogon undulatus</u>)	13,868	15.1
Spotted seatrout (<u>Cynoscion nebulosus</u>)	12,474	13.5
Sand seatrout (<u>Cynoscion arenarius</u>)	9,235	10.0
Kingfishes (<u>Menticirrhus</u> spp.)	6,764	7.3
Red snapper (<u>Lutjanus campechanus</u>)	4,065	4.4

^aFrom U.S. Department of Commerce, Current Fishery Statistics No. 8321 (1984).

^bFrom U.S. Department of Commerce, Current Fishery Statistics No. 8322 (1984).

*Biased sampling believed to have inflated 1980 surf smelt harvest estimates. Corrected procedures in 1981 reflected harvest of 3,979,000 surf smelt or 10.2 percent of Pacific coast harvest which still ranked first in number of fish harvested by species.

Surveys demonstrate that when marine anglers are asked to identify the species they prefer to catch, their responses closely parallel the species actually caught. The leading five species, or complex of similar species, sought by marine anglers during 1980 as identified by Hiett, et al (1983) are presented below (table 3).

Table 3. -- Marine anglers' species preferences^a

Species	Percent
<u>Pacific</u>	
Surf perch, complex (<u>Embiotocidae</u>)	18.2
Lingcod (<u>Ophiodon elongatus</u>)	9.4
Rockfish, complex (<u>Sebastes</u> spp.)	9.2
Flounder-sole, complex (<u>Rothidae</u> - <u>Pleuronectidae</u>)	8.3
Bonito (<u>Sarda chiliensis</u>)	5.5
<u>Atlantic</u>	
Bluefish (<u>Pomatomus saltatrix</u>)	22.2
Summer flounder (<u>Paralichthys dentatus</u>)	15.1
Winter flounder (<u>Pseudopleuronectes americanus</u>)	10.6
Drum, except red (<u>Sciaenidae</u>)*	8.3
King mackerel (<u>Scomberomorus cavalla</u>)	4.9
<u>Gulf</u>	
Spotted seatrout (<u>Cynoscion nebulosus</u>)	24.5
Red drum (<u>Sciaenops ocellatus</u>)	15.0
Other drum (<u>Sciaenidae</u>)	9.3
Sea bass-grouper, complex (<u>Serranidae</u>)	8.0
Sheepshead (<u>Archosargus probatocephalus</u>)	7.3

^aFrom Hiett, et al (1983).

*Red drum was ranked as a separate species by respondees and ranked 13th in species sought on the Atlantic coast.

Expenditures

Marine recreational anglers make a significant contribution to the economy of the nation. In fact, including multiplier effects, the total economic impact of marine recreational fishing in 1980 was \$7.5 billion. Of the \$7.5 billion, \$3.9 billion was value added and \$1.7 billion was for wages and salaries. A total of 119,538 person-years of employment were generated. Included in these statistics was a 1980 retail sales figure of \$3.98 billion. The largest retail expenditure categories were boat fuel (19.1 percent), food (13.8 percent), and private transportation (13.6 percent) (Rockland, et al 1983).

As noted previously, marine recreational fishermen contribute significantly to the national diet. At the retail level, the sport harvest would convert to a total value of \$1.33 billion based on an average price of \$1.90/lb. in the round.

Thus, the enormous value of marine recreational angling has been docu-

mented, at least from a national perspective. For comparative purposes, United States commercial fish landings in 1980 had a total value of \$6.1 billion at the retail level. This figure represents the value of all commercial fishing sectors including harvesting, processing and marketing.

CHANGING MANAGEMENT PHILOSOPHIES

Optimizing Yield from Marine Fish Stocks

Little attention or concern was voiced on behalf of recreational utilization of marine finfish prior to the late 1950's. An allocation philosophy has been largely retained from this earlier period when the predominant use of marine fish stocks was for commercial or commodity use.

There is, however, a slowly growing appreciation that maximized protein landings on a sustained basis (maximum sustained yield) is not necessarily equated with highest value yield from a wild fish stock, particularly one of great recreational demand. Consideration of values other than maximum sustained yield, including impacts on recreational uses, is now mandated by the Magnuson Fishery Conservation and Management Act (MFCMA) of 1976 (P.L. 94-265) for management of fisheries in the Fishery Conservation Zone (FCZ) which extends from the Territorial Sea baseline seaward to 200 nautical miles. National Standard Number 1 of the MFCMA provides that management of each affected fishery should achieve optimum yield. Optimum yield is defined as maximum sustained yield as modified "by any relevant, economic, social or ecological factor."

Difficult allocation judgements, which must address the question of best use, or highest social value of a common property resource, historically have not been made by fishery regulatory bodies (Nakamura 1984). Rather, management strategies are generally developed which focus on what is best for the resource (which is appropriate), but with a less defensible underlying strategy of maintaining traditional user group participation in the fishery.

It is becoming increasingly apparent that aquatic resource administrators must carefully identify the full range of benefits from the common property fishery resource. Examination of the recent record of marine resource management decisions, indeed, reflects a growing awareness of the complex of social, economic and ecological considerations outlined in the MFCMA. This has been particularly apparent in the territorial waters of certain coastal states where recent analyses and management decisions based on a wider range of considerations may even be interpreted as a trend.

Allocation of limited finfish stocks which are in great popular demand by tourist and recreational consumers is perhaps the most striking example of such shifting concern. Specialty allocation is a highly emotional issue in coastal communities. However, retracing the United States' record of managing common property resources, inland (non-marine) fisheries, as well as terrestrial and migratory wildlife stocks, clearly reflects a history of difficult, but now commonly accepted, decisions of setting certain resources aside for recreational, non-commodity harvesting. Although traditionally exploited by market hunters for a significant portion of our history, no common property wildlife stocks continue to legally enter the commodity markets today.

Allocation decisions of a similar nature have been made for certain marine finfish stocks as well. As early as 1917, California's San Francisco Bay - San Joaquin Delta was closed permanently for market harvesting of white sturgeon (Acipenser transmontanus). Also in California, similar actions were subsequently taken for striped bass (Marone saxatilis), white catfish (Ictalurus catus), chinook salmon (Oncorhynchus tshawytscha), coho salmon (O. kisutch), American shad (Alosa sapidissima) and several species of croaker (Scienidae). Oregon decommercialized the steelhead (Salmo gairdneri) in the late 1960's. In Florida, legislation has prohibited the commercial sale of sailfish (Istiophorus platypterus), snook (Centropomus undecimalis), bonefish (Albula vulpes), and tarpon (Megalops atlantica).

The most recent, and perhaps most celebrated case of stock allocation to the recreational industry occurred in 1981 in Texas. For almost 100 years, Texas commercial and recreational user groups competed for red drum (Sciaenops ocellatus) and spotted seatrout (Cynoscion nebulosus). Historically, adequate data were not available for making informed decisions on stock conservation and optimization of yield from those stocks. Unfortunately, this remains a typical condition for many, if not most, coastal marine fisheries today. However, in the face of declining populations of both species, and with recently collected economic data, Texas, after careful deliberation, eliminated commercial fishing for both species on September 1, 1981. The recently collected economic data available to the state management agency documented that greater benefit would accrue to Texas citizens from a highly regulated recreational fishery for the two stocks.

The Texas example is particularly important because of the care with which the social and economic data were gathered and employed for deciding a difficult issue on merit. As recently stated by a Texas fisheries administrator, the age of fishery management through sole reliance on biological data is long gone -- it has become essential to include the development of, and reliance upon, sociological and economic data in fishery management (Matlock 1982).

The Sport Fishing Institute maintains that there are other marine fish stocks of such enormous value to the recreational industry that current commercial exploitation allowances must receive increased scrutiny. The Gulf and Atlantic stocks of king mackerel and the Atlantic coast stocks of striped bass are two such fisheries that come readily to mind.

Recreational Participant Involvement

The marine habitat and resources supporting recreational fisheries are in serious need of management attention. Critically important breeding and nursery habitat are being lost to pollution and physical alteration and development. Populations of many recreationally-important fish species have been severely over-harvested because of the lack of adequate management information and attention. The decline in growth in marine recreational fishing, as noted earlier, is possibly correlated with the decline of favorite food fish species along the United States' coasts (Martin 1983). Programs to acquire information necessary to protect and enhance marine fisheries requires constituency support, both financial and at the policy level.

Perhaps, the most important development in the marine sport fishing arena is the increasing involvement of the recreational constituency in the decision

making process. The Texas situation made clear the need for statistically-reliable data bases upon which to make difficult allocation decisions. Improved social, economic and biological data are essential for protection and enhancement of marine recreational fishing interests. It is imperative that each state maintain a bureaucracy to provide aggressive advocacy on behalf of the marine recreational fishing fraternity. Such is the case with respect to each state's inland fishery resources, but this is not the current situation for marine recreational fishing in every coastal state. To accomplish this objective demands improved constituency recognition, and political representation. Neither are likely to occur in the absence of direct constituency funding (user-fee). This may be recognized by the reader for what it is -- a euphemism for a fishing license for marine recreational fishermen. Hopefully, the leading edge of a most important trend can be discerned in establishing licensing programs for the nation's marine recreational fishermen.

Recently, Maryland became the first state on the Atlantic coast to require licensing of certain marine anglers. Beginning on January 1, 1985, all anglers age 16 though 64 years of age, fishing in the tidal waters of Chesapeake Bay and tributaries in Maryland, will be required to buy a \$5 annual license. Importantly, the enabling legislation clearly earmarked all monies collected by the license for recreational fishing enhancement. Although the new license has a number of exemptions, it represents an extremely valuable action on behalf of Maryland's marine sport fishermen and a hopeful precedent for coastwide consideration.

Close on the heels of the Maryland action, the Louisiana legislature provided for special licensing of saltwater anglers in that state. The \$5.50 fee for the new saltwater license in Louisiana is required in addition to the basic \$2.50 fishing license. Marine recreational anglers will demand, and receive, greater consideration in resource program decisions in these states, now that their fees are being collected and used for this purpose.

The need for protection and enhancement of the vast recreational fishery and associated aquatic resources provided by the nation's marine waters is great and the cost of achieving these goals will be high. The licensing of saltwater anglers, along with concurrent establishment of adequate safeguards to insure that license revenues are spent for intended purposes, offers a reasonable and practical solution to this most pervasive problem.

Currently, only eight of the 23 coastal states require that saltwater anglers be licensed. With the recent addition of Maryland (and the expanded program in Louisiana), this elite group of progressive states includes the four west coast states of Alaska, California, Oregon and Washington, and the Gulf coast states of Alabama, Louisiana and Texas.

CONCLUSION

Recreational fishing has been clearly demonstrated to support a large and expanding industry of material importance to the national economy. The popularity of marine recreational fishing exhibited sustained growth exceeding seven percent per year between 1955 and 1970 and then declined to just over four percent per year between 1970 and 1980. The decline in the rate of growth of marine sport fishing has been associated with increasingly severe conflicts between resource availability and public demands among commercial and recrea-

tional harvesters of shared stocks.

If the marine recreational fishing fraternity is to prosper, certain fundamental program changes will be required, particularly along the Atlantic coast. To engender such improved practices, the marine recreational fishing constituency must grow in political sophistication and begin to play the full role which has lain latent for so long. Indeed, increasing constituency activism is apparent along all coasts. Perhaps the two most important trends in the sport fishing arena today are assumption of direct funding responsibility for program management (user-fees), and increased efforts to focus attention by research and management agencies upon the true value of marine finfish utilization by the recreational fishing community. Greater awareness of social and economic values inherent with recreational consumer utilization is being exhibited in a number of coastal areas.

LITERATURE CITED

- Deuel, David G. 1981. Statistical Highlights - U.S. Fisheries, 1981 - VIII, Recreational Fisheries. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Washington, D.C.
- Deuel, David G. 1984. Special surveys related to data needs for recreational fisheries. In John H. Grover (ed.), Proceedings of the Technical Consultation of Allocation of Fishery Resources, Vichy, France, 20-23 April 1980. Food and Agriculture Organization, p. 77-81.
- Hiett, Robert L., Kathryn A. Chandler, Audrey K. Reniere, and Richard A. Bolstein. 1983. Socio-economic aspects of marine recreational fishing. Conducted under Contract No. 80-ABC-00152 by KCA Research, Inc. for National Marine Fisheries Service, Washington, D.C.
- Martin, Edwin P. 1983. Commonality between commercial and recreational fishermen. In Richard H. Stroud (ed.), Marine Recreational Fisheries 8:63-71. Sport Fishing Institute, Washington, D.C.
- Matlock, Gary C. 1982. The conflict between user groups of red drum and spotted seatrout in Texas. In Richard H. Stroud (ed.), Marine Recreational Fisheries 7:101-108. Sport Fishing Institute, Washington, D.C.
- Nakamura, Eugene L. 1984. What is the best use of fish resources in the U.S. Gulf of Mexico? In John H. Grover (ed.), Proceedings of the Technical Consultation of Allocation of Fishery Resources, Vichy, France, 20-23 April 1980. Food and Agriculture Organization, p. 289-292.
- National Oceanic and Atmospheric Administration. 1984. Marine Recreational Fishery Statistics Survey, Atlantic and Gulf Coasts, 1979 (revised) - 1980. Current Fishery Statistics Number 8322. National Marine Fisheries Service, Washington, D.C.
- National Oceanic and Atmospheric Administration. 1984. Marine Recreational Fishery Statistics Survey, Pacific Coast, 1979-1980. Current Fishery Statistics Number 8321. National Marine Fisheries Service, Washington, D.C.

- Rockland, David, Gary Brown, Brad Ingram, and Bruce Weyrauch. 1983. Economic activity associated with marine recreational fishing in 1980. Conducted under Contract No. NA82AA-H-00054 by Centaur Associates, Inc. for Sport Fishing Institute, Washington, D.C.
- U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census. 1982. 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. 156 pp. U.S. Government Printing Office, Washington, D.C.
- Van Doren, Carlton S. 1984. Sport participation, sporting goods sales, and recreation expenditures. In Carlton S. Van Doren (ed.), Statistics on outdoor recreation, part II, the record since 1956:288-296. Resources for the Future, Inc., Washington, D.C.

The Future of Artificial Reefs
in Fisheries Enhancement

by

Richard B. Stone
National Marine Fisheries Service
Washington, D.C. 20235

Artificial reefs are manmade or natural objects intentionally placed in selected areas of marine, estuarine or freshwater environments to provide or improve fish habitat. Much of the ocean, estuarine and fresh water environment has a relatively barren, featureless bottom that does not provide the habitat that reef fishes need. Natural reefs and rock outcrops are limited. Less than 10% of the continental shelf can be classified as reef habitat. Where rough bottom exists, even if it is low profile rock outcrops, fish and invertebrates can be found.

Properly sited and constructed artificial reefs can provide the same benefits as natural reefs. They can enhance fish habitat, provide more accessible quality fishing grounds, benefit the anglers and economies of shore communities and increase total numbers of fish within a given area. Artificial reefs function the same as natural reefs. They provide food, shelter, spawning and nursery habitat and provide orientation in an otherwise rather featureless environment.

Many nontoxic solid waste or surplus materials have been used in the United States to build reefs-junked automobiles and streetcars, scrap tires, damaged concrete pipe and building rubble, surplus or derelict ships, and numerous other materials including gas and oil structures. Rocks, tires, Christmas trees and brush piles have been popular reef material in

freshwater. Scrap materials will continue to be used in the future, but we must become more sophisticated in their use. More recently fabricated structures such as Japanese style fish houses, concrete structures, and fiberglass coated plastic units have been tested in the United States. Fabricated units are commonly used in Japan and Taiwan. We will see an increased use of fabricated units in the United States in the future. Fish aggregating devices (FADs) also are becoming popular in the United States. These have been used for many years in the western Pacific. They are now in use in South Carolina waters as well as off Florida and in the Caribbean.

Although artificial reefs can enhance recreational and commercial fishing opportunities, creating a successful reef entails more than placing miscellaneous materials in ocean, estuarine and freshwater environments. Planning is needed to ensure the benefits of artificial reefs. If materials are improperly placed or constructed, all or part of a reef can disappear or break apart and interfere with commercial fishing operations or damage natural reefs.

Artificial reefs are being used in a few areas to mitigate habitat loss. California Edison Power Company dredged an area to install cooling water pipes and built a large artificial reef to provide fish, shellfish and kelp habitat offshore of the area that was dredged. Mitigation money is funding artificial reef research in Virginia. Delaware may mitigate habitat loss with artificial reefs in the future. Another beneficial use of reefs has occurred in the State of Washington - the use of reefs to improve angler success around urban fishing piers.

If the reefs are sited and built properly, the improvement in fishing success can be dramatic in both saltwater and freshwater. South Carolina

biologists found that angler catch-per-unit-of-effort was 80% higher on FADs than on traditional ocean trolling areas. Artificial reefs provide interesting habitat for sport divers, often much closer to shore than natural reefs.

In the United States, the Federal role is to promote the proper use of artificial reefs by local governments and the private sector in a manner compatible with other interests. Federal biologists have worked with State, university and private sector scientists to learn how reefs work. While research is continuing, information is being provided to reef builders to help them in their efforts. Federal agencies are working together and with States, the Fishery Management Councils, commissions, industry and the public on planning for orderly, effective artificial reef development. This will result in a National Artificial Reef Plan which is a requirement of the National Fishing Enhancement Act of 1984.

Most State natural resource agencies have active aquatic resource and management programs. Some of these involve the use of artificial reefs. State researchers, university scientists and consulting firms with expertise in artificial reef research and development are involved in site specific planning and development in some States.

Many of the artificial reefs constructed in the United States over the last 40 years were initiated by organizations such as sport fishing clubs, artificial reef committees, and diving clubs. When these organizations have called upon Federal, State, local, and university expertise, the results were usually good. Without this expertise, reef development can be frustrating, expensive, and ineffective.

Recent developments in the private sector should help resolve some of the problems reef builders have as they try to get programs started. Several companies have been formed that provide considerable expertise in artificial development and other companies have added expertise in this area. Also, the Sport Fishing Institute, with seed monies from the U.S. Department of Commerce's Saltonstall-Kennedy Grant Program, created the Artificial Reef Development Center (ARDC), which serves as an information repository, exchange, and clearinghouse. Its goal is to be an on-going, self-sustaining entity with operating funds from the artificial reef constituency or funds from services the ARDC provides. The ARDC facilitates reef development by matching potential reef sponsors with donors of materials, providing data to researchers and managers, and providing data on artificial reefs to ocean-resource user groups.

The public sector and State and Federal Government in the United States will continue to work together towards solving the problems of financing reef programs, improving the technology level, and communicating to resource managers the economic and environmental benefits that can result from habitat enhancement with artificial reefs. The National Plan now being developed and site specific State plans will mean a few less reefs but more effective efforts. We will see more State involvement and, for many States, direct supervision of all artificial reef efforts.

Funding is still a question mark. If expanded Wallop-Breaux funds become available, many States will use part of these monies for their reef programs. Salt water licenses may provide some new money for reef construction.

I am encouraged with the prospects for the future - better planning, better communications and more effective reefs.

COASTAL FISHING TOURNAMENTS: A REVIEW OF PARTICIPANT
CHARACTERISTICS, MOTIVES AND SPENDING PATTERNS

Alan R. Graefe and James M. Falk

Abstract.--This paper summarizes previous studies of 16 coastal sport fishing tournaments. Socio-economic characteristics of participants showed greater variation across different tournaments than did motives for participation. Tournament fishermen generally attached more importance than other types of fishermen to motives related to the challenge and experience of the catch. The prize money was a relatively unimportant motive for participation, although it appeared to play a greater role in tournaments offering a larger purse. While spending patterns associated with fishing tournaments varied widely, tournaments have often generated substantial economic activity in their host communities.

INTRODUCTION

Saltwater sportfishing is a relatively new development in this country. Certainly men have always fished for fun, as well as sustenance, but marine angling for the sake of pure sport did not become popular until the mid-1800s and the big boom had to wait for the turn of the twentieth century (Woolner 1972).

The first great wave in saltwater sport fishing came directly after World War II. Part of the boom in 1946 must be credited to greater affluence, rapid transportation and more leisure time. Communications media clarified the exploits of marine anglers and manufacturers created saltwater tackle well within the budgets of average citizens.

Based upon available data, it is evident that saltwater sportfishing was a prime target of opportunity seized upon by mushrooming coastal populations to partially fulfill their desire for water-based recreation (Schmied 1980). For instance, between 1955 and 1980, participation in saltwater sportfishing in the United States increased from approximately 4.5 million participants to over 12 million participants (U. S. Fish and Wildlife Service 1982).

Even prior to this major surge in saltwater angling, however, competition over fishing success flourished. Because of human competitive instincts, catching the largest or heaviest fish has probably always been a way of showing fishing superiority. Since the earliest days of organized competitive saltwater angling, most fishing events have emphasized the largest and the most glamorous of the offshore big gamefish (billfishes, tuna, wahoo, dolphin). In addition to the famous international big-game tournaments, however, there have been thousands of state, county, town and privately-sponsored tournaments that attract both experienced and novice anglers.

Frank Woolner (1972) writes in his book, Modern Saltwater Sport Fishing, that during the summer months there are roughly 900 fishing contests underway from the northeast maritime provinces down through metropolitan New York and New Jersey. He also noted that there are just as many for each comparable length of seaboard southward through Virginia, the Carolinas, and Florida into the Gulf of Mexico and up the Pacific coast to Alaska.

There has been a rapid proliferation of saltwater fishing tournaments during the past ten years. The number of coastal tournaments in South Carolina alone, for example, jumped from 11 in 1975 to 32 in 1978 (South Carolina Wildlife and Marine Resources Department 1979). The trend toward greater numbers of tournaments has been accompanied by increasing levels of published information about tournaments. The International Game Fish Association, the internationally recognized rule-setting organization, regularly publishes a calendar listing events occurring around the world. Their January-February 1984 issue listed 181 tournaments, of which 72 were coastal (including Great Lakes) United States tournaments. At a state level, the Texas A&M University Sea Grant Program published a calendar of saltwater fishing tournaments occurring along the Texas coast in 1984. Fifty tournaments, ranging from inland bay fishing competitions to offshore billfish events, were listed in 17 coastal towns and cities. Other states have also used various publication outlets to disseminate listings of tournaments occurring along their shorelines. The recently announced 2nd annual O'Hara's 1985-1986 International Sport Fishing Tournament Directory appears to be the most comprehensive source of information on tournaments, with detailed descriptions of over 3,000 local, regional, national and international competitions.

Today's tournaments are sponsored by public sector agencies, individuals, charitable groups, ad-hoc committees, fishing clubs, Chambers of Commerce and businesses, almost all hoping to make a profit. Given the variety of sponsoring organizations, it is not surprising that there are various types of fishing tournaments. The "fun tournaments" offer as prizes trophies, small cash awards, and oftentimes other merchandise prizes such as rods and reels. Most state agencies that sponsor competitive fishing tournaments do so at no charge and usually award the fishermen who catch fish above a prescribed weight a certificate and jacket patch. These tournaments exemplify sportsmanship as the key ingredient. In the more "serious tournaments," cash awards run into the thousands of dollars and the wagering between anglers can be equally as lucrative.

The recent growth in the numbers of tournaments being sponsored has also been accompanied by a surge of studies examining various socio-economic aspects of tournament participation. The remainder of this paper summarizes pertinent information from these studies, with a particular focus on trends or patterns in study results. The following discussion is organized around three major themes found in most previous tournament studies: motives for participation, characteristics of participants, and the impacts of tournaments on local and regional economies.

TOURNAMENT FISHERMEN MOTIVES

Many studies have shown that fishermen fish for a variety of reasons in addition to the obvious goal of catching fish (e.g. Driver and Knopf 1976). The pertinent question for this paper is, to what extent are the motives of tournament fishermen similar to or different from those of other types of fishermen?

Table 1 compares the average importance of 13 motives for fishing reported in studies of three types of anglers: tournament participants, general boat fishermen and headboat fishermen. The data on tournament fishermen represent composite scores based on studies of five selected saltwater tournaments (see

Table 1. Comparison of motive importance scores of tournament fishermen, general fishermen and headboat fishermen. ^a

Fishing Motives	Tournament Fishermen ^b	General Fishermen ^c	Headboat Fishermen ^d
For the challenge or sport	4.3 (1)	3.1 (7)	3.9 (4)
To get away from the regular routine	4.1 (2)	4.1 (2)	4.1 (1)
For the experience of the catch	4.0 (3)	3.0 (8)	3.9 (5)
To be outdoors	4.0 (4)	4.0 (3)	4.0 (3)
For relaxation	3.9 (5)	4.1 (1)	4.1 (2)
To be with my friends	3.9 (6)	3.2 (6)	3.6 (7)
To experience natural surroundings	3.7 (7)	3.5 (5)	3.6 (6)
To develop my skills	3.5 (8)	2.5 (10)	3.1 (10)
For family recreation	3.2 (9)	3.6 (4)	3.3 (8)
To obtain a trophy	3.0 (10)	1.6 (12)	2.5 (11)
To obtain fish for eating	2.8 (11)	2.7 (9)	3.2 (9)
For the prize money	2.8 (12)	N.A.	N.A.
To test my equipment	2.6 (13)	2.0 (11)	2.0 (12)

^a Values are mean scores on 5 point scale ranging from not at all important (1) to extremely important (5). Numbers in parentheses indicate rank order.

^b Values for tournament fishermen are means for 5 saltwater tournaments (n=1138)

^c Source: Boat fishermen residing in 8 counties near Houston-Galveston area of Texas Coast (Graefe 1980) (n=991)

^d Source: Delaware headboat customers (Falk et al. 1983) (n=434)

Table 2) while the data on general and headboat anglers were taken from studies of fishermen that included comparable questionnaire items (Graefe 1980; Falk et al. 1983). It should be noted that the three types of fishermen compared in Table 1 represent neither a mutually exclusive nor exhaustive classification of fishermen. That is, the general fishermen sample may include some individuals who also fish in tournaments and/or on headboats; also the general fishermen sample is limited to boat fishermen residing in one region of Texas and therefore does not represent bank, pier or surf fishermen or those in other geographic areas. The data presented represent independent samples of fishermen selected primarily on the basis of comparability of variables and response formats. The purpose of this comparison is to place what is known about tournament anglers into perspective with what we know about fishermen in general.

From the information presented in Table 1, it appears that tournament fishermen are similar to other types of anglers with respect to most fishing motives, although they differ in a couple of important ways. All three groups of fishermen indicated relatively high importance for motives related to escaping regular routines, relaxation, being outdoors, being with friends and experiencing natural surroundings. Similarly, all three groups attached relatively low importance to motives involving equipment, obtaining fish for eating, trophy fish and skill development.

The most notable difference between the types of fishermen was the importance of the challenge and experience of the catch to tournament fishermen. These items were the most important motives to tournament fishermen while they were only moderately important (7th-8th ranked) for the general fishermen. Headboat fishermen appear to be in between tournament and general anglers in the importance attached to challenge and the experience of the catch. The importance of fishing for family recreation also seemed to differ between types of fishermen, with general fishermen ranking this motive higher in importance than either tournament or headboat fishermen. Finally, although the motives related to equipment, trophy fish and skills were consistently among the lowest ranked by all three groups, it is noteworthy that tournament fishermen tended to report greater importance for these motives than either headboat or general fishermen.

Table 2 provides a more in depth examination of tournament fishing motives by comparing the motive profiles of participants in the five individual tournaments which comprised the composite tournament fishermen data given in Table 1. For most motives, there was little variation among the five tournaments. Challenge, getting away, being outdoors, and relaxing in natural surroundings were the most important motives to participants in all five tournaments. Some of the less important motives tended to show greater variation across different tournaments. For example, participants in the Deep Sea Roundup and TIFT Bay Division reported higher importance for obtaining fish for eating than those in the other three tournaments. Milford Weakfish Tournament anglers rated the importance of the prize money considerably higher (3.3) than participants in the nearby Lewes Harbour Marina Marlin Tournament (2.1). An examination of the prize money structure for tournaments suggests that a higher rating for this motive is usually given for those tournaments which offer significant prize winnings.

It is perhaps most noteworthy that tournament fishermen consistently attached greater importance to motives pertaining to the challenge and other aspects of the fishing experience than to either of the more tangible outcomes,

Table 2. Summary of fishing motives of participants in 5 saltwater tournaments.^a

Fishing Motives	Tournament				
	Milford ^b Weakfish	Lewes ^c Harbor	Deep Sea ^d Roundup	TIFT ^e Bay	TIFT ^e Offshore
For the challenge or sport	4.3	4.2	4.3	4.4	4.2
To get away from the regular routine	4.1	4.0	4.1	4.2	3.9
For the experience of the catch	3.8	4.2	4.2	4.0	3.9
To be outdoors	4.0	3.9	4.1	4.2	3.6
For relaxation	4.1	3.5	4.2	4.0	3.8
To be with my friends	3.8	4.0	4.2	3.7	3.6
To experience natural surroundings	3.4	3.7	4.0	4.0	3.3
To develop my skills	3.3	3.4	3.6	3.8	3.5
For family recreation	2.9	2.8	3.9	3.3	3.0
To obtain a trophy	2.9	2.9	3.1	3.1	2.8
To obtain fish for eating	2.7	2.2	3.4	3.4	2.5
For the prize money	3.3	2.1	2.9	2.7	2.8
To test my equipment	2.5	2.2	2.9	2.8	2.4

^a Values are mean scores on a 5 point scale ranging from not at all important (1) to extremely important (5).

^b Milford World Championship Weakfish Tournament, Milford, Delaware, May, 1981 (Falk et al. 1981) (n=666)

^c Lewes Harbour Marina Marlin Tournament, Lewes, Delaware, August, 1984 (Falk 1984) (n=26)

^d Deep Sea Roundup, Port Aransas, Texas, 1984, (Ditton and Loomis 1984) (n=226)

^e 45th Annual Texas International Fishing Tournament, South Padre Island, Texas, August, 1983 (Ditton and Freeman 1984) (n=54 Bay, n=166 Offshore)

obtaining fish for eating or prize money.

TOURNAMENT FISHERMEN CHARACTERISTICS

It is also relevant to examine the extent to which tournament fishermen differ from other types of fishermen in terms of socio-economic characteristics and overall fishing participation (Table 3). Concerning fishermen's occupations, tournament fishermen appear to be relatively similar to general boat fishermen, with both groups dominated by white collar job classifications. In contrast, the sample of Delaware headboat anglers included only 31 percent with white collar jobs. Tournament fishermen included a lower percentage of retired individuals than either general or headboat fishermen.

Income differences between types of fishermen were particularly striking. Fishermen participating in the five tournaments represented here showed much higher income levels than either of the other groups, with 31% of tournament anglers reporting annual household incomes of \$60,000 or more. Headboat fishermen tended to have the lowest incomes and general boat fishermen were intermediate between headboat and tournament anglers.

There was little difference in the age distributions for the three types of fishermen. All groups averaged 40-44 years of age. There was, however, a distinct difference in the overall fishing participation levels for the three types of anglers. Tournament fishermen were clearly more avid than either headboat or general fishermen. The individual tournament studies show that tournament anglers generally are active in a variety of types of fishing in addition to tournament participation.

Table 4 compares the characteristics of participants in the five specific tournaments identified earlier. While age and overall fishing participation were relatively consistent across the five tournaments, the occupation and income distributions showed some noteworthy variation. For example, the Milford Weakfish Tournament was an exception to the general pattern of white collar occupations and high income levels. Nearly half of the Milford fishermen reported blue collar jobs and less than 20 percent reported incomes as high as \$40,000. In contrast, the TIFT Offshore Division represented the other extreme, with over half of the participants in the \$60,000 and above income range. The TIFT Bay Division, on the other hand, showed greater resemblance to the Milford Weakfish Tournament in occupation and income comparisons. This can be partially explained by noting that both of these events were "bay tournaments" rather than open ocean events. Blue collar workers and lower income fishermen are apparently more likely to fish in these types of tournaments compared to the more costly offshore competitions typified by the other three tournaments.

These data demonstrate that one should use caution in generalizing about all tournament fishermen, since there are different types of tournaments which may attract very different clienteles. Caudle et al. (1980) made a similar point by describing three general "types" of participants in 13 saltwater tournaments in North Carolina: "Jim Surf Fisherman," "Tom Mackerel Fisherman," and "Bill Marlin Fisherman." The summary profiles provided for these basic types of tournament fishermen varied in socio-economic status, amount and type of equipment owned and used, type of fishing group and the relationship between one's job and tournament participation.

The data presented in Tables 1 through 4 also illustrate that the

Table 3. Comparison of characteristics of tournament fishermen, general fishermen and headboat fishermen.

Fishermen characteristics	Tournament Fishermen ^a	General Fishermen ^b	Headboat Fishermen ^c
<u>Occupation</u> ^d			
White Collar	59%	58%	31%
Blue Collar	20%	29%	40%
Other Employment	14%	3%	8%
Student	3%	1%	6%
Retired	4%	9%	15%
	100%	100%	100%
<u>Income</u>			
Under \$10,000	3%	6%	10%
\$10,000 to \$19,999	9%	17%	28%
\$20,000 to \$29,999	19%	34%	31%
\$30,000 to \$39,999	15%	21%	18%
\$40,000 to \$49,999	14%	10%	8%
\$50,000 to \$59,999	9%	5%	3%
\$60,000 and above	31%	7%	2%
	100%	100%	100%
<u>Age</u> (Mean)	40	44	42
<u>Days Fishing In Past Year</u> (Mean)	44	31	27

^a Values for tournament fishermen are means for 5 saltwater tournaments (n=1138)

^b Source: Boat fishermen residing in 8 counties near Houston-Galveston area of Texas Coast (Graefe 1980; Ditton and Graefe 1978) (n=991)

^c Source: Delaware headboat customers (Falk et al. 1983) (n=434)

^d White collar job classifications include professional, technical, managerial, sales; Blue collar jobs include skilled, semi-skilled, craftsman, foreman, service worker.

Table 4. Summary of characteristics of participants in 5 saltwater tournaments.

Fishermen Characteristics	Tournament				
	Milford Weakfish ^a	Lewes Harbor ^b	Deep Sea Roundup ^c	TIFT Bay ^d	TIFT Offshore ^d
<u>Occupation</u>					
White Collar	39%	79%	55%	56%	65%
Blue Collar	48%	4%	15%	20%	15%
Other Employment	5%	9%	16%	24%	15%
Student	1%	4%	8%	0%	4%
Retired	$\frac{7\%}{100\%}$	$\frac{4\%}{100\%}$	$\frac{6\%}{100\%}$	$\frac{0\%}{100\%}$	$\frac{1\%}{100\%}$
<u>Income</u>					
Under \$10,000	3%	5%	5%	0%	1%
\$10,000 to \$19,999	16%	5%	6%	12%	5%
\$20,000 to \$29,999	38%	9%	10%	25%	12%
\$30,000 to \$39,999	24%	14%	14%	15%	7%
\$40,000 to \$49,999	11%	19%	14%	17%	9%
\$50,000 to \$59,999	5%	5%	13%	8%	12%
\$60,000 and above	$\frac{3\%}{100\%}$	$\frac{43\%}{100\%}$	$\frac{38\%}{100\%}$	$\frac{23\%}{100\%}$	$\frac{54\%}{100\%}$
<u>Age (Mean)</u>	42	43	40	37	39
<u>Days Fishing in Past Year (Mean)</u>	39	--	48	50	39

^a Milford World Championship Weakfish Tournament, Milford, Delaware, May, 1981 (Falk et al. 1981) (n=666)

^b Lewes Harbour Marina Marlin Tournament, Lewes, Delaware, August, 1984 (Falk 1984) (n=26)

^c Deep Sea Roundup, Port Aransas, Texas, 1984 (Ditton and Loomis 1984) (n=226)

^d 45th Annual Texas International Fishing Tournament, South Padre Island, Texas, August, 1983 (Ditton and Freeman 1984) (n=54 Bay, n=166 Offshore)

socio-economic characteristics of participants in various fishing tournaments probably differ to a greater extent than the motives for participating in the various types of tournaments.

SPENDING PATTERNS AND ECONOMIC IMPACTS

Most of the existing studies of coastal fishing tournaments have either focused on or included an examination of participant spending for tournament related expenses and the economic impacts resulting from this spending. Summarizing this research is difficult, however, because the studies have varied considerably in survey methodologies, particular questions included, and data analysis procedures. Table 5 presents some of the major findings for relevant variables that were generally reported in existing studies of 16 coastal tournaments over the past ten years.

The tournaments represented in Table 5 ranged from small billfish tournaments (e.g. the 20 boat Lewes Harbour Marina Marlin Tournament and 33 boat Hilton Head Billfish Tournament) to large fishing derbies (e.g. the Mississippi Deep Sea Rodeo with 5400 participants). Most of the tournaments involved 2-3 days of fishing by participants. The total direct spending by participants varied widely for different tournaments, as one would expect given the varying size and clientele of the individual tournaments. The range of total expenses shown, however, coupled with the growing number of tournaments sponsored in coastal areas, clearly demonstrate that fishing tournaments generate a substantial volume of economic activity.

Since the determination of economic impacts is influenced by where money is coming from and where it is spent, previous studies have generally reported the geographic origin of tournament participants. The data give in Table 5 show that tournaments differ considerably in the extent to which they attract non-resident fishermen. When interpreting the figures in Table 5, one should recognize that individual studies differed in their definitions of local residents. Thus, where possible the data are presented in terms of identifiable jurisdictions (i.e. county or state); where this was not possible, the "local" area generally was defined in the original study in terms of a reasonable region surrounding the study site.

Most of the economic analyses have also examined the distribution of tournament fishing expenditures across various expense categories. Typically, fuel costs for both transportation and boat use account for the largest share of fishermen expenses. Substantial amounts of money are typically also spent, however, in other business sector related to tackle and equipment, bait, repairs, groceries and beverages, restaurants and lodging establishments.

It should be noted that many of the studies represented in Table 5 included analyses which utilized local multipliers to expand the estimates of direct fishermen expenditures into larger estimates of total economic impacts on a designated area. The results of these analyses are not included in Table 5 because of wide fluctuation in multipliers selected and inconsistent data analysis and reporting procedures.

IMPLICATIONS FOR TOURNAMENT PLANNING AND RESEARCH

Coastal sport fishing tournaments can provide many benefits to local

Table 5. Summary of selected variables from economic studies of coastal fishing tournaments.

Tournament	Number of Anglers	Total Direct Expenses	Length of Tournament	Origin of Fishermen
Texas International Fishing Tournament (Ditton and Freeman 1984)	446	\$435,000	3 days	62% out of county
Hilton Head Billfish Tournament (SC) (Potts 1984)	^a 33	\$162,777	2 days	33% out of state
Lewes Harbour Marina Marlin Tournament (DE) (Falk 1984)	^a 20	\$20,800	2 days	28% out of state
Virginia Beach Anglers Club Small Boat Marlin Tournament (Lucy 1983)	^a 84	\$32,949	2 days	50% not local
Greater Jacksonville Natural Light Kingfish Tournament (FL) (Ellerbrock et al. 1983)	3166	\$440,557	4 days	38% not local
Fort Pierce Offshore Fishing Tournament (FL) (Ellerbrock et al. 1983)	784	\$186,436	2 days	56% not local
Bethany-Fenwick Surf Fishing Tournament (DE) (Rockland and Falk 1982)	265	\$24,345	2 days	58% out of state
Greater Jacksonville Natural Light Kingfish Tournament (Milon et al. 1982)	2355	\$427,737	3 days	37% not local
Milford World Championship Weakfish Tournament (DE) (Falk et al. 1981)	1142	\$110,404	3 days	53% out of state
Lake Superior Trout and Salmon Derby (MN) (Fleischman et al. 1981)	953	\$70,515	2 days	15% not local

Table 5, continued.

Tournament	Number of Anglers	Total Direct Expenses	Length of Tournament	Origin of Fishermen
Nags Head Surf Fishing Tournament (NC) (Caudle et al. 1980)	500	\$50,000	3 days	52% not local
Arthur Smith King Mackerel Tournament (Smith and Moore 1980)	1844	\$879,000	2 days	50% out of state
Ocean Springs Rodeo (MS) (Daniel 1974)	220	\$8,260	^b 2.2	2% not local
Biloxi Rodeo (MS) (Daniel 1974)	1210	\$91,801	^b 2.3	11% not local
Mississippi Deep Sea Rodeo (Daniel 1974)	5400	\$824,000	^b 3.5	22% not local
Narragansett Tuna Tournament (Farrell 1972)	^a 376	\$211,283	6 days	53% out of state

^a

Value given is number of boats in tournament since number of people was not reported.

^b

Value given is mean number of days participation in tournament rather than length of tournament.

sponsoring communities. Oftentimes, however, the benefits are not fully understood. The results presented from previous studies of coastal tournaments reveal that ample information is now being generated to understand tournament anglers and the impacts they provide. The results from these studies, if interpreted accurately, can be useful to tournament planners and organizers for marketing and conducting future tournaments.

Understanding the motives of tournament participants can help sponsors to plan for more successful tournaments. Most studies seem to indicate that the experience of the catch or the challenge involved is a primary consideration to tournament anglers. Efforts to enhance the challenge of the tournament experience can therefore be expected to contribute to satisfying fishermen experiences. Other motives for fishing may vary depending on the prize money offered or the type of tournament. For instance, if participants look at the tournament as a form of family recreation, sponsors could plan family activities that focus on enjoyment for all members and low entry fees. If winning prize money is a major reason for entering the tournament, sponsors need to make sure the winnings are adequate to encourage repeat participation in future years.

Socio-economic data on participating anglers can help tournament officials to become familiar with the types of fishermen that make up their rosters. This information can be used to target the potential audience of future tournament fishermen. Additionally, if monitored over time, trends and changes in clientele can be observed. Changes may be subtle, but they may occur as tournament rules and regulations change.

Information on spending habits and patterns can provide local communities with a "yardstick" for judging how successful a given tournament was from a financial standpoint. The previous studies suggest there may be numerous ways to expand the local economic impact if it is deemed a positive benefit to the community. First, entry fees may be raised. Secondly, sponsors may increase the number of allowable participants, if there is a limit, or add additional fishing days. Other indirect techniques would include providing activities or events for non-fishing companions or offering other attractions to encourage fishing parties to extend their stay in the local area. Any of these efforts might increase participation and associated spending in a given area. However, sponsors should carefully evaluate the tradeoffs that might be involved with such actions. Previous studies have largely ignored the additional costs a tournament can impose on a host community (i.e. increased traffic and congestion, police protection, etc.). Such potential costs should be considered in light of economic impacts to give a fair appraisal of the actual benefits of a given tournament.

Advertising is a major component of any tournament. An inexperienced tournament organizer may have difficulty deciding on an appropriate method of advertising. Data collected in certain studies can help one to select the most effective advertising routes. Knowing home towns of past participants, having some knowledge of the types of outdoor magazines participants read, and even knowing if past participants are active boaters can shed some light on where advertising and tournament promotion will have their greatest influence. Sound marketing statistics can also go far in locating and obtaining sponsors (both money and merchandise) to support a tournament.

Some studies suggest that an enjoyable trip to an area to participate in a local tournament can yield benefits in the future since some participants may elect to return even without a tournament taking place. Additionally, if

fishing success is superior during a tournament, outdoor stories and articles in local magazines may flourish. This may produce a "goldrush" effect on a local area, with new participants as well as experienced fishermen attracted to the area in hopes of good fishing. If an area does experience a growth in its recreational fishing participation, additional support facilities may be necessary to accomodate the growth. This potential recreation/tourism development may introduce tradeoffs which local communities must evaluate for themselves.

Coastal fishing tournaments will, no doubt, continue into the future. One concern shared by both organizers and participants is the status of the various sport fish species upon which tournaments and all fishing depend. Reduced stock levels may encourage more catch and release tournaments for a number of different species.

How does one predict future trends in coastal tournament studies? Research on tournaments has progressed from simple spending surveys to studies that have estimated economic impacts and characterized this unique subset of saltwater anglers. Future studies may begin a more in depth examination of the relationships between local tournaments and the tourism infrastructure in coastal communities. Future studies may also attempt to monitor participants' feelings on fisheries management strategies. Although tournament anglers represent only a small part of the saltwater fishing public, their fishing experience and frequency appear to be greater than that of other types of anglers. Their suggestions and recommendations on fisheries management could become valued in certain situations.

It is difficult to predict what the future of saltwater tournaments will be. We do know they have many positive benefits that have been documented, they are enjoyed by many thousands of anglers all over the world, and their future depends on the future stocks of our most valued recreational species.

LITERATURE CITED

- Caudle, N., Hart, K. and Griffin C. 1980. Profile of a tournament fisherman. Coastwatch, University of North Carolina Sea Grant Newsletter, October, p. 4.
- Daniel, D. L. 1974. A survey of sport fishing related expenditures in a selected portion of the Mississippi Gulf Coast. Bureau of Business Research Report, 20 p. University of Southern Mississippi, Hattiesburg, Mississippi.
- Ditton, R. B. and Freeman, D. L. 1984. 1983 Texas International Fishing Tournament: an analysis of participants' characteristics, attitudes, and expenditures. Texas A&M University Sea Grant Report TAMU-SG-84, 58 p. College Station, Texas.
- Ditton, R. B. and Graefe, A. R. 1978. Recreational fishing use of artificial reefs on the Texas Coast. Texas Coastal and Marine Council Report (77-79), 155 p. Austin, Texas.
- Ditton, R. B. and Loomis, D. 1984. Unpublished data, Department of Recreation and Parks, Texas A&M University, College Station.

- Driver, B. L. and Knopf, R. C. 1976. Temporary escape: one product of sport fisheries management. *Fisheries* 1(2): 21-29.
- Ellerbrock, M. J., Milon, W. J., and Sparks, A. L. 1983. Economic impact and participant characteristics of offshore sportfishing tournaments: two Florida case studies. Agricultural Experiment Station Economic Information Report 176, 24 p. University of Florida, Gainesville, Florida.
- Falk, J. M. 1984. Lewes Harbour Marina Marlin Tournament study. Unpublished report, University of Delaware Sea Grant Marine Advisory Program, 3 p. Lewes, Delaware.
- Falk, J. M., Graefe, A. R., Alkire, C. and Swartz, D. 1983. 1982 Head/charter boat fishing in Delaware: an analysis of customers and their economic impact. University of Delaware Sea Grant Technical Report DEL-SG-03-83, 61 p. Newark, Delaware.
- Falk, J. M., Graefe, A. R. and DuBose, W. P. IV. 1981. 1981 Milford World Championship Weakfish Tournament: a socio-economic analysis. University of Delaware Sea Grant Technical Report DEL-SG-25-81, 50 p. Newark, Delaware.
- Farrell, J. F. 1972. Estimated spending by 1971 Narragansett Tuna Tournament participants. Marine Memorandum No. 10, 7 p. University of Rhode Island Marine Advisory Service, Narragansett, Rhode Island.
- Fleischman, W. A., Jesswein, W. A., Nelson, J. L., and Mack, T. 1981. Lake Superior Trout and Salmon Derby angler survey: 1979. Minnesota Sea Grant Extension Report, 33 p. University of Minnesota.
- Graefe, A. R. 1980 The relationship between level of participation and selected aspects of specialization in recreational fishing. Unpublished Ph.D. Dissertation, Texas A&M University, College Station, Texas, 155 p.
- Lucy, J. 1983. Summary of the economic impact of the Eighth Annual Virginia Beach Anglers Club Small Boat Marlin Tournament. Marine Resource Report #83-3, 3 p. Virginia Sea Grant Marine Advisory Services, College of William and Mary, Gloucester Point, Virginia.
- Milon, J. W., Ellerbrock, M. J., Brinkman, G. L., and Logan, C. M. 1982. Economic impact and participant characteristics for the First Annual Greater Jacksonville Natural Light Kingfish Tournament. Technical Paper No. 21, 19 p. Department of Food and Resource Economics, University of Florida, Gainesville, Florida.
- Potts, T. D. 1984. Economic impact and entry decision characteristics: Hilton Head Billfish Tournament. Unpublished technical report, 13 p. South Carolina Sea Grant, Clemson Extension Service, Beaufort, South Carolina.
- Rockland, D. B. and J. M. Falk. 1982. A socio-economic evaluation of the Bethany-Fenwick Chamber of Commerce Annual Surf Fishing Tournament: 1981. Unpublished technical report, 35 p. University of Delaware Sea Grant Marine Advisory Service, Lewes, Delaware.
- Schmied, R. L. 1980. Development of marine recreational fisheries in the southeastern United States: problems and some solutions. In J. H. Grover (ed.) Allocation of fishery resources, p. 333-345, United Nations Food and

Agricultural Organization, New York.

Smith, J. W. and Moore, C. J. 1980. A socio-economic survey of the Third Annual Arthur Smith King Mackerel Tournament. South Carolina Marine Resources Center Technical Report Number 46, 11 p. South Carolina Wildlife and Marine Resources Department, Charleston, South Carolina.

South Carolina Wildlife and Marine Resources Department. 1979. The fishing tournament boom. Saltwater Conversation 1979 (6): 17.

J.S. Fish and Wildlife Service. 1982. 1980 survey of hunting, fishing and wildlife-associated recreation. Washington, D.C.: U.S. Government Printing Office.

Woolner, F. 1972. Modern saltwater sport fishing. New York: Crown Publishers, Inc. p. 319.

BOATING: THE DREAM AND THE CHALLENGE

George R. Rounds, CAE

Abstract -- The continued rise in popularity of boating as a leisure activity for Americans continues to create pressures on planners to meet the rising demand. Objections to creation of facilities based on utility, economic, environmental, aesthetic are groundless. Development requires public-private cooperation and funding; some of it now available through the recently enacted Wallop-Breaux Act. Larger facilities are ideal as the focal point for urban waterfront renewal.

"There's nothing, absolutely nothing half so much worth doing as simply messing around in boats." -- The Water Rat, Wind in the Willows

For whatever reason, the human animal has a fascination with the water. Waterfronts of any size, be they mountain streams or ocean expanses, present an almost irresistible attraction to the human heart and mind. The added heritage of waterways and oceans as the arteries of commerce serves only to reinforce man's communion with the shifting waters of the planet earth.

Before World War II, man's ability to recreate on the water was limited by his perception of the sport as a pastime of the wealthy and by the almost subconscious aversion to self-pleasure rooted in the Puritan ethic, not to mention the general lack of affordable product available to the general public throughout America. To be sure, there was a recreational boating industry and public prior to WWII, but it was not until the consumer society met with the advanced outboard motor and fiberglass production methods that boating as we know it today became so much a part of the American leisure scene.

While the numbers are incomplete for earlier years, the estimates of boating's growth are impressive (Table 1).

Table 1 -- Estimates of Boating & Boating Expenditures

Year	Number of Persons Going Boating	Boats in Use	Spent at Retail in Boating
1904	N/A	0.014	N/A
1930	N/A	1.5	N/A
1964	38.5	7.7	\$2,605
1969	43.2	8.6	\$3,292
1974	48.1	9.6	\$4,607
1979	58.1	11.6	\$7,500
1984	67.2	13.5	\$12,340

Figures in millions

Source - National Marine Manufacturers Association

Barring crisis and catastrophe, such as the 1973 oil embargo when the cost of the raw materials and the fuel to power boats rose dramatically, it can be expected that new boats will be added to the current fleet of 13.5 million at the same rate or better than the average over the past decade, when the total of all boats sold hovered consistently around the half-million mark annually.

BABY BOOMERS

Further, industry studies point to a potential market for new boat buyers and first time boat buyers of around 900,000 persons, considered "hot prospects" by all demographic analysis. Most of these are in the middle and upper-middle class group, the "baby boomers" who are or soon will be in the 25-45 year old bracket. This group forms the largest middle class of white collar workers in American history -- 77 million strong -- a group destined to shape the country's cultural (and recreational) landscape for the rest of the century.

The baby boom generation fits almost to a tee the profile of the American boating consumer, in age levels, income brackets, home ownership, marital status, family size, etc. So it is safe to assume that the 900,000 "hot prospects" referenced earlier is at least a conservative estimate of where boating might be headed in the decades ahead.

"Baby boomers had such a mesmerizing youth... their expectations are colliding with reality, and there are all kinds of conflicts ahead."¹

It is just that growth and the "me-generation baby boomers" expectations that are going to collide with the finite waterfront available to them -- whether for boating, beaching, surfing, fishing, sunning, sunset-watching, and living.

Thus boating is both a dream and a challenge -- the dream of a rising, educated, more affluent, more demanding generation and the challenge of today's management in both the government and private sectors to meet the demands posed by that dream. Can we succeed? I believe we can, but it will require a cooperative and learned approach to a series of important questions, questions that must be addressed if we are to not only accommodate the demand but also protect the limited resources available. This will require compromises on both sides of the issues, but it is possible.

IMPEDIMENTS TO GROWTH

Perhaps the major problem facing boating facilities development today is the preception by the non-boating world of what is needed and for whom it is needed. Perhaps you have heard it said before, but the boating community suffers from the general impression held by environmentalists, legislators, and regulators, not to mention the general populace, that boating is for the few idle rich who recreate aboard their luxury yachts, power and sail, and therefore is not a sport of the masses.

Clearly this image is wrong. While there are fleets of expensive vessels riding at anchor in the harbors of the sunbelt regions, there also are swarms

of smaller boats of all types, power and non-powered, that repose in garages, basements, on trailers in back yards, and in stack storage facilities in every state in the nation. And these are the heart beat of boating in America. Registration figures from the U.S. Coast Guard -- which do not necessarily include sailboats -- illustrate this point beyond a doubt.

The total number of registered boats 40 ft. in length or more is a scant 0.3% of the total number of registered boats reported by the Coast Guard (Table 2).

Table 2 - Registered Craft Totals by Length - 5 Years

LENGTH	1979		1980		1981		1982		1983	
	Inboard	Outboard	Inboard	Outboard	Inboard	Outboard	Inboard	Outboard	Inboard	Outboard
Under 16'	134,580	4,640,703	119,506	4,795,035	183,257	4,975,667	120,095	4,999,552	113,784	4,977,426
16'-26'	843,436	1,856,032	868,551	1,931,188	894,270	1,976,231	905,489	2,064,724	934,905	2,116,141
26'-40'	172,454	41,195	182,207	42,486	172,612	42,658	207,887	55,196	195,856	57,616
40'-65'	22,452	5,026	23,738	5,118	23,752	4,841	21,754	4,506	22,853	4,699
Over 65'	1,191	664	1,234	747	1,413	1,247	841	991	1,288	1,201
TOTAL	1,174,113	6,543,620	1,195,236	6,774,574	1,275,304	7,002,644	1,256,066	7,124,971	1,266,666	7,157,065

And the percentage would drop even further if one counted canoes, rowboats, sailboards, racing shells, etc. To form a prejudicial attitude based on such a low percentage is not only undignified, it is unfair.

Nonetheless, the image of boating's "fat cats" persists. I merely want to remind the reader that it is fallacious, and invite your support of the truth.

The same can be said of the image of boating as a "user" of the aquatic environment, user in the sense that we consume the very liquid on which boating depends. Countless accusations are made by the ill-informed that boating, particularly powerboating, is toxic to the aquatic environment. It simply is not so. Studies by the EPA clearly show that the environmental impact of powerboats on the biosystems of both fresh and salt water is miniscule, if present at all. A 1973 study, utilizing high stress conditions of several confined lakes, concluded that "it is plausible to conclude, that because of the high stress levels employed in the study, outboard motor emissions do not significantly affect the aquatic ecosystems."²

Equally worthy of note is the study of the effects of a marina on aquatic ecosystems in a saltwater environment. The University of Rhode Island research project in 1973 compared ecosystems in a marina and in a natural cove of equivalent size and character. The conclusions:

"In most respects, the marina cove and the marsh cove appeared to be not only similar but also compatible ecological systems."³

The third objection to boating facilities expansion and development is that such a facility would create a drain on the resources of a community. Is this, too, a myth? It would appear so.

In analyzing the potential impact of a new marina development in Lake County, north of Chicago on the shore of Lake Michigan, the Lake County Economic Development Commission projects a potential economic benefit to the community of \$17,371,091 annually, of which \$9,326,500 is directly drawn from the boating public, the balance being a projection of such things as potential boat show revenues, increases in household incomes through the draw of a boating facility bringing a higher caliber of resident, and the "export" of boating services to nearby communities.

Not to be ignored is the emotional and aesthetic impact a boating facility will have, not "might have", on the community in which it is located. The almost intangible benefit to the community is enhanced even more when such a facility replaces a heretofore broken down waterfront. More and more communities are looking at their commercial waterfront, which once was the center of economic life for the community, and realizing that this blemish is in fact a valuable asset waiting to be plucked and put to work for the community. The trend is evident as communities like Baltimore, Philadelphia, Boston, look to their greatest single natural asset and turn it into a center for urban living and recreation.

INLAND FACILITIES

I have dwelled on the in-water, marina, boat harbor issue up to this point, and unjustly, for there is a much larger segment of boating that does not require extensive waterfront facilities in order to partake in its favorite leisure activity. As noted earlier, much of the majority of boats in use are in fact of a size and type that does not require in-water facilities other than an occasional place to tie up. Most boats are portable, trailerable, or cartop capable, and require only a launch point from which to venture forth. Access points are what we are talking about and they may be a single gravel ramp poised at the edge of the river or lake, or a multi-lane paved launching facility with holding docks, trailer parking, and comfort facilities. We estimate there are probably some 100,000 launching ramps of one grade or another scattered throughout the country, most of them a short drive from population centers and most of them overcrowded. Some are in more remote areas where fishing is the primary objective of the user.

The figure given is only an estimate, for at the moment there is no single source of information on numbers of launching facilities because the developing agencies -- and the vast majority of ramps have been constructed by state or federal agencies -- often have unsophisticated records. A project currently is underway at NMMA however, to attempt to tally the various and diverse records on launching facilities, tabulate them by state and hopefully by county, in order to properly direct the future development of such facilities.

The same seat-of-the-pants estimate for marina facilities reveals a population of some 5,700 serving the in-water needs of the boating public, and while this pair of pants is more finely tailored, it is still only an estimate. Again, a project is underway to obtain a more definitive count of marina facilities throughout the nation and to place them by county.

Let me share one other observation as it relates to boating and that is the drift of the population to the urban centers throughout the nation. This continuous migration, coupled with a migration to the sunbelt, has created and will continue to create additional pressures on those communities in those states with blossoming populations to provide facilities of one sort or another for their boating publics. Projections of demand need to be done by individual communities based on the demographic information available. Once completed, those demand projections can be linked to economic and sociological advantages to support the arguments for creation of boating facilities.

Counter arguments to providing a facility for the perceived idle rich "yachting public" are invalid, as noted earlier. The majority of the boating public does not fit the "fat cat" image so often projected by opponents to boating facilities development. Further, what is often ignored is the overall sociological benefit to the community derived from the addition of a boating center. Experience has shown again and again that the marina, the boat harbor, is indeed a source of enjoyment for countless non-boating visitors who find the environment of a boating center pleasurable. At a 1984 Urban Waterfronts seminar in Alexandria, Virginia, one speaker after another cited the marina as the keystone to the revival of a city's blighted waterfront. The boating facility becomes an integral part of the magnet that draws other investments aimed at providing recreation for the general public. And as an industry concerned with meeting the needs of the boaters, we strongly suggest that the broader spectrum of recreational needs be included in any plan to create an urban marina. One needs only look at key areas in Florida, Southern California, Baltimore, to see how the boating facility brings a flavor and a focus to the entire redevelopment area. We also believe that the urban center is where such facilities should be located for the following obvious reasons:

1. A suitable use for an unused or underused waterfront.
2. The broad appeal of the facility to the entire populace.
3. That's where the people are.

Matching the dream to the reality could be done with relative ease if it were not for a general lack of vision on the part of the planning agencies and the acknowledged shortage of capital. Let me address both.

Our available waterfront, both coastal and inland, is finite. Even if massive landfill and impoundment projects were possible, the percentage gain in waterfront would be minimal. Ten years ago, it was estimated that only three percent of our coasts were available to the general public. Subtract from that vast stretches of beaches, both National seashore and local beaches, and marshlands properly dedicated as aquatic preserves, and the available frontage nearly disappears. What is in private hands, because of simple supply-demand pressures, is prohibitively expensive for boating facilities development, and therefore generally falls into waterfront residential or other use. To permit an available stretch of waterfront to fall into private hands without firm structures that preserve the public's right to access to that waterfront -- for whatever reason -- is tantamount to treason.

How then, does one assure that the limited waterfront resource left to us is retained for the greatest public good -- in this case recreation in all its forms? Essentially by government decree, whether state, regional, or

local. Responsible government must take steps today to dedicate waterfront property to water dependent uses. I repeat: water dependent uses. While many of the Coastal Zone plans reference the matter, few states or municipalities have taken firm action toward protecting waterfronts from non-water dependent usage. To place a commercial building, condominium or other facility at the waterfront without providing for public access for recreation must be prevented in the future and can only be done if firm policies are adopted that prohibit such development and, in fact, encourage water dependent development through tax abatement, government ownership and public support. It is perhaps a radical and distasteful step for a government to take, radical because it limits how a private owner may sell or develop his property, and therefore distasteful. But is it an investment in the future by assuring Americans of an environment where quality of life is protected. A shining example of the impact of such a program is the city of Chicago where the stretch from the massive McCormick Place exhibit hall north to the Wisconsin border is, for the most part, public park, recreation areas, and boat harbors (albeit crowded harbors). The foresight of the city in securing that asset for future generations is outstanding. Slowly, governments are coming round to this philosophy, but the process is painful, and often times too late to have major impact.

FUNDING DEVELOPMENT

Because of the extremely high value of waterfront property, creation of new recreation facilities, and in particular boating facilities, is difficult from a private venture viewpoint. At today's costs and low slip and mooring rental rates, the return on investment is marginal, encouraging investors to seek developments or investments with higher returns. A common savings account generally has a higher R.O.I. than a new marina, unless, and here's where hope appears, a cooperative venture between public and private resources can be forged. For only through such a joint investment of public and private funds can a new harbor prove economically viable -- with some limited exceptions.

The passage of the Wallop-Breaux Act in 1984 adds further hope to the creation of additional boating facilities. Appropriately called the Boating and Fishing Enhancement Act, the act takes an estimated \$70,000,000 annually in motorboat fuel tax receipts, adds an estimated \$15,000,000 from import duties on boats, yachts and fishing equipment, and certain Dingell-Johnson Excise Tax revenues on fishing equipment, to create a massive fund for boating safety, facilities development and sport fish restoration. Specifically, the act proposes to make available the following funds for specific purposes:

- \$45 million: boating safety, split \$15 million to Coast Guard boating safety programs and \$30 million to state boating safety programs.
- \$94 million: sport fish restoration account, split 10% to facilities enhancement and the balance to fishery enhancement.

Thus, a minimum of \$9 to \$10 million dollars annually is expected to become available on a 75/25 federal/state matching fund basis for facilities. To be sure, not massive funding when one considers the costs of waterfront development, but nonetheless, the opportunity exists for funding more launching ramps and marinas.

These funds are not the sole source of financial aid to governments seeking to improve their waterfronts. Urban renewal incentives, stream bank protection funds, and even highway improvement dollars can be utilized creatively in the support of recreational facilities development.

The scenario is likely to be as follows:

- * A location is found that is or will be available either through acquisition or prior ownership by the city or town or state.
- * Funds are allocated from state and federal sources to the acquisition and improvement of the site.
- * Private investors are encouraged to become lease-holders at the waterfront and to create the needed recreational facilities there -- the marina.

Thus, the marriage of private and public funds and effort makes it possible for the creation of additional boating facilities.

Where launching facilities are concerned, the investment is almost always governmental and usually quite manageable. A common practice is to incorporate a launch area within the construction or reconstruction of a bridge, a public utility, or other facility thus minimizing the land and construction investment required.

CONFLICT & COMPROMISE

Finally, there will be conflict not only at the water's edge, but out in the mainstream, as user groups compete for the available acreage. Water skiers and fishermen already are at war in some locales; canoeists and outboarders compete for virginal streams and lakes; sailboaters demand protection from the powerboat; and somewhere between them and the beach are the surfers, divers, and swimmers. Each believes in their personal right to the water's surface. And in a sense, each is right. Again, out of conflict comes compromise, and possibly regulation. The conflict can be abated, however, by opening additional waters to the recreating public for all uses.

There is no question that the size of the American boating population will expand in the decade ahead. The size of that growth will hinge greatly on the ability of the new boaters to get to the water. They will seek, and perhaps demand of their elected leaders expansion of access points to existing waterways. In return, they may have to accept limited restrictions on their boating in the form of hours of operation, speed limits, and zoning. The ability of public and private agencies to create those additional facilities is enhanced by the influx of Federal funds derived from the users themselves. That same ability could be impacted by personal greed and the absence of a clear understanding of the long term benefits to our communities of providing the people of America with an accessible aquatic environment.

It is in our own best interests, as citizens of this great country, to assure, through government action and private support, the water sports venues of today are secure and the opportunity exists for creation of additional venues for a growing population that will demand their place in the sun by or on the water.

- ¹"Great Expectations: America and the Baby Boom Generation",
Landon Jones.
- ²Analysis of Pollution from Marine Engines and Effects on the
Environment; U.S. Environmental Protection Agency, Grant
No. R-801799, Program Element No. 1BB038.
- ³Ecology of Small Boat Marinas, Scott Nixon, Candice Oviatt,
Sharon Northby, Graduate School of Oceanography, University
of Rhode Island, Kingston, RI, 1973.

URBAN WATERFRONTS: POSITIVE DIRECTIONS, NEW PROBLEMS¹

Jon Lucy², Ann Breen³ and Dick Rigby³

Abstract: Urban waterfronts have experienced well-defined cyclic trends of development, deterioration, neglect and redevelopment. The nationally successful urban waterfront redevelopment trend now being enjoyed is experiencing certain problems. Private sector-local government development successes and federal fiscal constraints have encouraged marked federal reductions in waterfront project funding. Other success-related conflicts include: cities losing their waterfront "character" by copying other successful redevelopment designs, the private sector's demands competing with public access needs on waterfronts, the "working waterfront" being forced from traditional areas, cities underutilizing heavy industry on their shorelines as major tourist attractions, congested urban marinas causing conflicts, and the irretrievable loss of urban piers. By adhering to guidelines that have produced successful waterfront projects in the past, cities can resolve these conflicts and maintain the momentum of the waterfront renaissance.

Additional keywords: Waterfront redevelopment, historical perspective, conflicts, funding, working waterfronts, urban marinas, urban piers.

North America, especially the United States, is experiencing a highly popular movement to bring back decaying urban waterfronts to productive use. This waterfront revitalization phenomenon, while appearing to have "taken off" rather suddenly, has, in fact, been building to its present impressive status since the 1950s and early 1960s (Anon. 1964; Balchen and Linville 1971; Cowey 1979; Wood 1965). With the occurrence of certain key developments in the 1970s, e.g. the passage of environmental/water quality legislation, growth in federal funding for urban development, and events like Operation Sail awakening major urban ports to the potential of their waterfront, the waterfront "renaissance" movement gathered sustaining momentum (Cowey 1979; Horn 1982; Lucy 1981; Moss 1980; National Research Council 1980).

Continued growth of waterfront successes during the early 1980s has brought a sense of maturity to what now is widely considered to be a major development trend (Wrenn et al. 1983). The current period, however, is also

¹VIMS Contribution Number 1223

²Virginia Institute of Marine Science, School of Marine Science, College of William and Mary, Gloucester Point, VA

³Co-Directors, The Waterfront Center, 1536 44th St., N.W., Washington, D.C.

posing significant challenges to waterfront revitalization interests with major cutbacks in federal urban development funds and intensifying conflicts for use of remaining urban shorelines threatening to slow the momentum (Breen and Rigby 1984a,b; 1985). Local governments and private development interests will have to strengthen and build upon their evolving partnerships in waterfront projects to keep these problems from negatively impacting the trend curve.

HISTORICAL OVERVIEW

1800s - Mid 1900s

Urban waterfronts in the United States have experienced well-defined cyclic trends of development, deterioration, neglect and reuse (Nat'l. Res. Council 1980). They have therefore played key roles in both urban growth and the decline of downtown areas, or, stated another way, waterfronts have experienced the best and worst of urban development (Freedman 1982). In most major, early American towns and cities the waterfront was typically the first area to develop intensely and the first area to suffer serious decline or decay (Horn 1982).

The face of urban waterfronts begin undergoing considerable change in the mid 1800s as warehouses and shipping facilities were joined on the shoreline by rapidly growing rail systems. Adding to the heavy industrial use of many downtown waterfronts, the railyards required extensive land and further expanded the industrial barrier around urban shorelines. With this change many waterfront communities began to experience some decline in their dependency on the water and, likewise, the fully productive use of their waterfronts. Around the turn of the century some major, water-oriented cities made efforts to renew their declining waterfront zones following the inspiration of Daniel Burnham and Frederick Olmsted, proponents of the "City Beautiful" movement; however, by the mid 1900s most bustling waterfronts were significantly hamstrung by out-of-date, and therefore less frequently used, shipping and rail facilities. Shifts in scale of industrial development and population movements away from downtown areas helped fuel the abandonment-decay phase that was overtaking most urban waterfronts (Freedman 1982). Both World Wars helped slow down the gradual deterioration of many downtown shorelines but even the emergence of some federal economic development programs in the 1930s and 1940s could not stop the process.

Post World War II

Following World War II waterfronts experienced significant negative changes as a result of the impact trucking began having on the handling of goods, thereby diminishing the role of shipping. Dramatic increases in automobile traffic in downtown areas associated with post-war suburbanization produced increasing demands for highway corridors to and through such areas (Horn 1982; Freedman 1982). For many water-oriented cities the result was a massive highway system constructed along the now largely rundown waterfront. While improving car and truck flow through the downtown area, the multi-lane belts of concrete created not only debates, but in many instances sizeable physical barriers between city residents and their

shorelines. Shoreline rail systems further complicated the situation in numerous cities including Boston, New York, Chicago, New Orleans, San Francisco, Milwaukee, Portland (Oregon), St. Louis, and Toronto (Cowey 1979; Wallace 1979; Natl. Res. Council 1980; Wrenn et al. 1983).

Other major restrictive reuses of available underutilized waterfront lands followed the War, resulting in long term constraints on future shoreline uses in many cities. As air transportation became more popular and sophisticated, larger and often new airports were needed in major cities. Many such cities lying beside waterways turned quickly to filling such areas or acquiring relatively cheap waterfront land to expand airport facilities. The airport trend with its associated noise problems preempted many waterfront cities' future shoreline land use plans (Natl. Res. Council 1980). Major examples of waterfront airport dilemmas are found in Boston, New York, Philadelphia, Washington, and San Francisco, to name a few cities.

A second significant post-war preemptive use of waterfront land resulted in cities where port facilities were being adapted to handle the new containerships. Enormous quantities of waterfront land were now fenced in for storing and redistributing containerized cargo. While fewer berths were needed than in previous years, each containership berth required 16-35 acres of storage and handling area as well as supporting highway and railroad facilities (Natl. Res. Council 1980; Wagner 1980). While necessarily keeping ports competitive, this nationwide expansion of port cargo handling areas permanently removed a large block of urban waterfront land from future consideration for other uses.

Late 1950s - Early 1960s

A slight change in outlook concerning America's urban waterfronts began to evolve in the late 1950s and early 1960s. Both private enterprise interests and officials in local governments began to see the potential for something other than decay, seediness, wasteland and heavy industry on waterfronts that had once been the pride of the cities built around them. Local foresight and imagination were fanned into plans of action by newly available federal urban renewal funds. While the waterfront was not always the principal focus of these early projects, older waterfront cities did, in many instances, incorporate the downtown shoreline in their plans. The major impact of the new urban renewal movement, even when not focused directly on the waterfront, was that for the first time a mechanism existed to bring together the necessary mixture of development powers, techniques and funding that had a realistic chance of reversing the urban decay trend (Anon. 1964).

By the mid 1960s signs began to appear that urban renewal, especially urban waterfront renewal, was not just a "flash in the pan" but a movement warranting serious consideration. A 1964 issue of Journal of Housing was devoted to waterfront renewal, outlining projects underway using Housing and Urban Development (HUD) funds in twelve shoreline cities with eight additional cities listed as having project plans on the drawing board (Anon. 1964). Projects ranged from revitalizing business areas, fishing fleet facilities and industrial areas to including a relatively new element on the

waterfront -- recreational marina and park facilities. It is fair to say that the 1960s marked the real launching point for urban waterfront renewal. In 1965 a White House Conference on Natural Beauty (Anon. 1965) even devoted a panel session to "Water and Waterfronts," and during the sixties HUD channeled funds into older waterfront areas in over 80 cities (Moore et al. 1971).

Late 1960s - Mid 1970s

The late 1960s through the mid to late 1970s witnessed a strong surge in urban waterfront renewal coupled with a national desire to improve the quality of water adjacent to urban communities. Years of abuse were giving way to recognition of the waterfront as a unique resource (Wrenn et al. 1983), one that almost more than any other urban element was a renewable, physical, economic, and cultural resource (Horn 1982). Urban waterfront lands were finally being viewed as a special class of natural resource that was unique in its potential "to afford society diversified opportunities for economic development, public enjoyment and civic identity" (Nat'l. Res. Council 1980).

As might be anticipated, the jump in waterfront renewal activity during this period brought with it a number of problems, conflicts and pressures. Demands for tourist and recreational facilities, new housing, as well as environmental concerns contributed to conflicts over direction and appropriate mixes of principal waterfront uses. Adding to the pressures on waterfront decision makers were simultaneous demands for port expansion, deepening of channels, sites for energy facilities, new marinas, building of shoreline highrise office buildings/condominiums, and historical preservation projects (Covey 1979).

A 1971 poll taken by the periodical Nation's Cities indicated that while many cities had plans for development of their waterfronts, most were still on the drawing boards because of complex problems concerning issues of jurisdiction, ecological impact of project elements, and conflict among potential waterfront user interest groups (Balchen and Linville 1971). The dilemmas faced by cities wanting to renew their waterfronts were further documented by surveys conducted in 1973 and 1976 of over one hundred of the largest Standard Metropolitan Statistical Areas (SMSA) in the U.S. (Hanna et al. 1978). In 1973, 107 of 119 SMSAs surveyed had potential for urban waterfront development, and 68% of the 107 actually had proposals for such development or had completed some portion of their development, including the cities of Chicago, Philadelphia, Detroit, San Francisco-Oakland, Baltimore, Miami, Rochester, San Antonio, Louisville, Honolulu and Wichita. A 1976 update of the 1973 survey indicated that, while nearly one third of the respondents had implemented some phase of physical development, approximately half of the SMSA's returning questionnaires had progressed no further with their development plans than when queried three years earlier. Conflicts and financial problems were listed as being largely responsible for the lack of progress, while bond program successes were noted as significant for those cities completing some development.

During this time, however, federal programs were being put into place at an accelerated pace which provided a significant boost to urban waterfront development. Early in the 1970s implementation of federal water quality legislation by the Environmental Protection Agency resulted in regulations and incentives to clean up the nation's waterways, especially those in urban areas. During this same period of renewed interest in the shoreline and adjacent waters, the Coastal Zone Management (CZM) Act was passed, providing waterfront and access planning funds to states. By 1978 approximately 30 local waterfront planning projects had been funded in 13 states by CZM funds (Cowey 1979), with the number growing to hundreds of projects by the early 1980s.

Late 1970s

In the late seventies several new urban initiatives were launched by the federal government. This resulted in the Department of Interior's (DOI) Heritage, Conservation and Recreation Service (HCRS) undertaking studies of urban park (DOI 1977) and recreation (DOI 1978) needs as well as urban waterfronts (DOI 1979). The National Park Service established three Gateway National Recreation Areas, all of which were designated in coastal/Great Lake cities, i.e. New York, San Francisco and Cleveland (Cowey 1979). Maritime preservation programs were also developed under HCRS and the National Trust for Historic Preservation.

The seventies also saw the National Endowment for the Arts (NEA) sponsor well over 30 waterfront studies and project designs through the "City Edges" and other programs (Cowey 1979). The urban waterfront enhancement "movement" also received very significant funding support in this period from HUD's Community Development Block Grant Program, e.g. the cities of Norfolk, Toledo, Bridgeport (Connecticut), Gloucester and Newburyport (Massachusetts).

Celebrations As Catalysts.--A major turning point for many large, urban waterfronts came during the Bicentennial celebration. First, preparation for the celebration led historical researchers and city leaders back to America's waterfronts during cities' searches for their roots (Knecht 1979). The maritime portion of the Bicentennial known as Operation Sail 1976 was the real eyeopener, however. During the summer of 1976, either through their own communities' celebration experience or through the eyes of the media, many people in the nation's shoreline cities understood for the first time the importance and magic of their waterfronts (Lucy 1981; Moss 1980; Wrenn et al. 1983). The festival visit of 16 of the world's 20 Tall Ships, along with some 50 medium-sized "tall ships" and other character vessels of every age and description (Clark 1976), brought home to many water-dependent communities that they had sacrificed a major part of their heritage and vitality by allowing their waterfronts to fall into neglect. In Newport, Rhode Island, Boston, and Baltimore, many experienced for the first time the visible realities of urban renewal accomplishments on their waterfronts.

Operation Sail also opened the eyes of local government and civic leaders to another fact. They now had in their hands an underutilized tool that could help bring back to life, as well as maintain, the new-found grass

roots interest in revitalizing waterfronts. The tool was waterfront festivals. In 1980 a national conference on such festivals and how they were helping communities of all sizes attract new life, resources and tourist dollars to their waterfronts indicated that, if planned properly, such events could significantly effect desired changes on waterfronts (Lucy 1980). The conference also highlighted the growth trend in numbers of waterfront festivals since Operation Sail and presented strong evidence that successful festivals were capable of generating significant economic activity over relatively short periods of time (Farrell 1973; Della Bitta et al. 1977; Reichert and Lovell-Troy 1978; Lucy and Baker 1979; Lucy and Vance 1982). Recreational activities, including festivals, were playing a significant role in America's rediscovery of its urban waterfronts (Nat'l. Res. Council 1980).

Meanwhile, more Americans than ever were traveling abroad to old, but vibrantly alive, European waterfronts such as Copenhagen, Paris, London and Amsterdam. Such travel served to reinforce the growing interest back home to conserve and wisely use urban waterfronts (Knecht 1979). In general Europeans have treated the character of their urban waterfronts as a valuable recreational resource and cultivated such areas to be visually attractive public spaces (Orski 1979).

The 1980's

During the late 1970s, utilizing the various funding and interest-maintaining options available, shoreline cities continued redeveloping portions of their waterfronts at a steadily increasing pace. By the early 1980s the number of projects underway or in the planning stages were almost too numerous to realistically count (Pettigrew 1984). By 1981 more than 50 cities had completed substantial projects and at least another 50 were either in advanced stages of planning or had projects underway (Horn 1982). As serious questions were beginning to arise in federal circles concerning future waterfront funding, the Departments of Commerce (DOC) and Interior published planning documents offering encouragement to cities on improving their waterfronts (DOC 1980) including urban fishing and other waterfront recreation opportunities (DOI 1981).

In 1981 the federal funding picture began changing. By 1984 some of the programs previously providing significant funding for urban waterfront redevelopment were effectively eliminated (Land and Water Conservation Fund) or scheduled to be phased out (EDA, CZM). Cutbacks had also occurred in HUD and the NEA (Breen and Rigby 1984a) although not to the severe degree initially expected. The decline in federal backing for urban waterfront projects, however, in no way appeared to dampen the demand for such activities.

Responding to the continued interest in revitalizing waterfronts, the private sector began stepping in more strongly, joining the federal government as a major working partner with whom local governments could accomplish their waterfront ambitions. Mr. Leo Molinaro, President of The Rouse Company, a subsidiary of the American City Corporation, stated in his keynote address to the Urban Waterfronts '83 conference that his company

believes urban waterfronts offer a great, if not the greatest, new opportunity for reclaiming a vital part of American urban heritage. The company finds a yearning among people of the country for waterfront development which exceeds the desire for development of any other part of the environment (Breen and Rigby 1984b).

In general the private sector's involvement in waterfront renewal has resembled The Rouse Company's concept whereby the city in question must come up with the funding for the project and the private entrepreneur provides the package of design and development know-how to complete the job. Cutbacks in federal funds have also made the role of corporations, foundations and private benefactors all the more important to cities still hoping to bring new life to their shorelines (Breen and Rigby 1984a). These recent funding pressures have led to a growing concern among urban waterfront interests that more and more cities are going to mindlessly copy or "clone" what has proven successful in other areas, possibly destroying the diverse character of community waterfronts.

NEW CONFLICTS

Festival Market Cloning

Herein lies a relatively new conflict for the waterfront renaissance to resolve. Since "Faneuilization" (Breen and Rigby 1984a) has proven so successful, cities feel the need to pursue the festival market concept closely identified with The Rouse Company as the centerpiece for their waterfronts' rebirth. Considering the widely publicized accomplishments of Boston's Faneuil Hall/Quincy Market (opened 1978), Baltimore's Harborplace (opened 1980), Norfolk's Waterside (opened 1983), and New York's South Street Seaport market (opened 1983), this is natural. While admittedly there are limited items on the urban waterfront planner's pallet with which to work, it would be a grave mistake for waterfront communities to focus only on markets in their development plans. If this happens the ultimate result could be a series of "Harborplaces" strung around the nation's major urban waterfronts rather than the distinctive characters of such cities being proudly displayed. There are convincing arguments for the festival market being a reusable recipe for many waterfront cities. Care must be taken, however, that communities avoid a mindless duplication of existing projects

The Rouse organization, and others like it, must routinely address themselves to this dilemma, but Rouse maintains the policy that there is an important place for good retailing in every city. In addition, as long as a marketplace includes a high percentage of local businesses and has enough staying power to stand the test of time, it should be given serious consideration in a major waterfront revamping project (Pettigrew 1984). Some would say the marketplace trend is not only established but growing, considering New York City's somewhat controversial South Street Seaport festival market (Brown 1981; Pettigrew 1984); the scaled-down marketplace in Manteo, North Carolina (American City Corp. 1984); and the festival retail shopping complex anticipated on the Jacksonville, Florida waterfront in the next several years (Clare et al. 1984).

"Faneuilization" or "Watersiding" of urban waterfronts is only one of the recent conflicts brought about by the success trend of cities returning to their waterfronts; however, the entire history of waterfront redevelopment has been fraught with major confrontations and problems. There have been numerous conflicts which were almost "show-stopping," e.g. special interest groups not being able to work out differences over principal waterfront uses - Pensacola, Florida (Nat'l. Res. Council 1980), unacceptable zoning-Georgetown waterfront in Washington, D.C. (Basile 1978), waterfront jurisdictional quandries - New York City (Moss 1980), real estate market value versus preferred use (shipping facilities) value of prime waterfront - San Francisco (Nat'l. Res. Council 1980), loss of the "working" waterfront - New York's South Street Seaport (Brown 1981), highway routing - Baltimore (Wallace 1979) and numerous other cities (Portland (Oregon), San Francisco, New York City, etc.), and community groups' concerns about jobs and controlling secondary development around new waterfront development - Hartford, Connecticut (Galta 1983).

Even with this "conflict" background from which to draw experience and solutions, the waterfront movement still faces serious "new" problems beyond the festival market dilemma. Admittedly, some of the conflicts' newness is more in terms of the present intensity of the problems than their nature, but different times are upon us. Concerns are changing on the waterfront. A certain maturity has evolved from the coalescing of waterfront development concepts and attitudes that occurred in the late 1970s and early 1980s. These shifts in emphasis include: an increasing awareness of what has been already lost to communities on their waterfronts, a logical extension of historical preservation attitudes, water-related recreation's increase in popularity, new and even daring outlooks in American architecture, and the new understanding of basic aesthetic qualities offered by areas around water (Pettigrew 1984).

Private vs. Public Sector

When the previously mentioned shifts or "positive constraints" encounter the strong market forces now intensely competing for "their" spot on redeveloping urban waterfronts, the resulting friction can stalemate projects. In this regard an escalating conflict concerns the private sector's use of the waterfront versus the public's use. Intensifying battles to preserve and/or best represent the "salty" character of a waterfront about to undergo redevelopment must be channeled into "controlled burn" processes that allow progress to be made. With urban waterfronts being rediscovered as "hot real estate" (Wrenn et al. 1983), citizen groups and local government leaders must be constantly alert to the private sector's natural tendency to want to dominate the urban water's edges and harbor vistas. If caution is not taken, private development projects on the urban shore can quickly block most public access, both physically and visually, to the water (Breen and Rigby 1984a).

Marine vs. Non-Marine Enterprises

Another increasingly important conflict involves the issue of marine-dependent uses versus non-marine uses on developing urban waterfronts. For example, in Sausalito a major conflict involves the "rights" of a waterside

office building versus the rights of existing marinas and a boat repair yard (Breen and Rigby 1985). Fishing and tug fleets face growing pressures to force them out of historically used urban waterfront settings as more communities try their hand at waterside redevelopment. A few communities, however, are comprehending the positive benefits of such fleets as tourist attractions and working to keep them part of a mixed use development plan, e.g. Portland, Maine (Breen and Rigby 1985) and Plymouth, Massachusetts (Breen and Rigby 1984c). Unfortunately such compromises were not made in Seattle and Jersey City (Breen and Rigby 1985).

Forcing Out the Working Waterfront

The previously mentioned conflicts might more appropriately be included in a broader problem area that is developing into a major conflict in a growing number of waterfront communities. The "working waterfront" is being forced to significantly change its character or even to move out altogether because renewal development consists primarily of waterside restaurants, retail complexes, hotels, condominiums and highrise office buildings. In addition to the cities previously mentioned, there are others in which the "working" businesses are steadily losing ground, e.g. Stanford (Connecticut), Boston, Georgetown (Wash., D.C.), Hampton (Virginia), and Miami (Breen and Rigby 1985). However, even in this area of growing conflict there are a few cities which are wisely using the heavy industrial activity on their waterfront as a drawing card for the public and tourists. By using specially designed viewing points or towers to show off the fascinating work in progress, cities like Oakland, Portsmouth and Alexandria (Virginia), Seattle, and the City of Port Angeles (Washington), are capitalizing on the uniqueness of their working waterfronts (Breen and Rigby 1984c).

Urban Renewal Marinas

Large scale marina interests are finding that they too are having more difficult times on urban waterfronts than in previous years. Development costs are enormous compared to the return on the investment (Lucy 1979; Breen and Rigby 1984b), and the non-boating urban public is growing less tolerant of acres of masts or a wall of power boats cutting them off from an unobstructed view of urban harbors and waterways. Not only are the growing numbers of boats in the water becoming a concern on urban waterfronts, but in colder climates all such boats must be stored on land in ice-prone months. Such "parked" boats become as much of a barrier to the water as car-filled parking lots on the shoreline (Breen and Rigby 1984c).

Another conflict involving marinas concerns who uses the limited boating facilities added to the redeveloped waterfront and how should boat use patterns be controlled. Obviously a docking facility adjacent to a festival marketplace, as in Norfolk or Baltimore, would not desire to be filled with an assortment of "junkers", but attractive boats. Slip rental rates can help control the types of boats that use the facility, but fair transient use rules and rates must be developed to allow reasonable access to all who wish to enjoy the city's waterfront amenities by boat. Norfolk is presently attempting to deal with this problem. However, local boaters fear that if

the city follows through on its proposal to double its transient slip rates at the "Waterside Marina," the city's new hospitable image will return to that of earlier days when posted signs read "Dogs and Sailors, Keep Off The Grass!"

Urban Pier Attrition

Another conflict that now seems to be receiving more awareness is the question of either retaining or removing piers in the course of redeveloping a waterfront area. Piers are the ultimate in waterfront enjoyment for those who have always been landlocked. Simply put, piers allow otherwise land-bound people to "get out over the water" and the larger the pier, the more dramatic the experience (Breen and Rigby 1984c). Because of their enormous construction costs, piers, once they are damaged or torn down, are seldom repaired or replaced. There are, however, a few communities who understand the unique resource potential of piers, and they have renovated or replaced such facilities to the delight of their citizens, e.g. New York City's 107th Street pier, Santa Monica, Huntington Beach-Seal Beach, California (ocean piers replaced after 1984 storms), Newport News, Virginia (old section of James River Bridge now a fishing pier), North Beach, Maryland (in the planning stages), and Plymouth, Massachusetts (a new pier from which tourists can view fish unloading operations) (Breen and Rigby 1984c).

CONFLICT RESOLUTION: LOOKING AHEAD

The waterfront redevelopment movement in North America need not necessarily have its pace significantly slowed by what might appear to be growing burden of problems. Successful problem solving has been the forte of the waterfront renaissance. The trend can and will continue as long as cities do not forget what made their waterfronts great in the first place and which planning-development maxims proved critical to successful renewals of downtown waterfronts.

The foremost key to maintaining urban waterfront renewal's momentum is that coastal and riverine cities must put "people" first before all other development considerations. Cities must be tuned in to citizen action groups expressing sincere and constructive interest in the welfare of the waterfront. Special attention must be paid to the concerns and suggestions of those citizens presently occupying old waterfront neighborhoods. They, above all others, stand to win or lose the most in a redevelopment project. In the Waterfronts '83 conference Maurice Freedman of Sasaki Associates captured the essence of these thoughts with a remark he attributed to Martin Millspaugh, president of Baltimore's Charles Center-Inner Harbor Management, Inc. Freedman said, "the waterfront is the focal point of collective community ego" (Breen and Rigby 1984b). Cities must heed the positive experience of Waterfront Recapture, Inc. in Hartford, Connecticut and resolve the "people" problems while in the development planning phase of their projects (Galta 1983).

Are waterfront development projects really all that different and more difficult to work with than land oriented projects? The answer is yes. At least they are more challenging than other urban spaces because of the

water--both its beauty, its spaciousness and its bother (Breen and Rigby 1984a). "Bother" generally translates into much greater construction and facilities maintenance costs. "Waterfront" means bulkheading, possible flood control measures, unique erosion control measures necessitated by waves and vessel wakes, and extra design considerations in general. But waterfront also provides multi-faceted design opportunities unlike any other setting. The unique mix of design complexities and opportunities offered by urban waterfronts warrant special consideration of guidelines that have produced successful redevelopment projects.

By carefully reviewing such "success formula" elements within the framework of their own waterfront needs, communities should be able to anticipate, and thereby defuse, some of the major conflicts capable of preventing projects from realizing their full potential. Such key elements and concerns are:

*Public Access - A major project goal should be to increase public enjoyment of, and access (physical and visual) to, the waterfront, both from the land and water (Wood 1965). Plans should include open space and/or some park element (Natl. Res. Council 1980). Such space can allow for a greater portion of the city to share in the enjoyment (and economic benefits) of the waterfront and can markedly increase adjacent property values (Horn 1982).

*Working Waterfront - Waterfront restoration projects can and should preserve and strengthen traditional maritime activities associated with the working waterfront (Natl. Res. Council 1980; Horn 1982).

*Citizen Input - There should be significant community and neighborhood involvement in the planning and decision making processes of a project, and opposition regarding the project should be adequately addressed (Galta 1983; Hanna et al. 1978). In concert with a project goal to attract a variety of daytime and evening users to the redeveloped waterfront, the project should strive to encourage the populating of surrounding neighborhoods with involved citizens (Knecht 1979).

*Grass Roots Support - Short (Hanna et al. 1978) and long term grass roots citizen support for projects is essential since successful project elements, e.g. festival marketplaces, must have staying power (Pettigrew 1984). Citizen interest can both be developed and maintained with major civic events on the waterfront, e.g. festivals, fairs, boat shows, concerts, contests, etc. (Hanna et al. 1978; Lucy 1981; S. Miss. Plan. and Devel. District 1984).

*Community Character - Waterfront revitalization projects should personify and amplify the unique character of a given community's waterfront, i.e. its specific physical and geographic constraints, its peculiar heritage, its demographic and economic profile, and, of utmost importance, its own people or "cast of characters" (Breen and Rigby 1984a). Renewed waterfront should be characteristic of its community in such a way that people feel like it is the place they want

to be. Since revitalization projects most often cannot be built all at one time but must be built in stages, the first stage has to "feel right" to the community so its citizens are comfortable with and accepting of the results (Pettigrew 1984).

*Development Mechanism - Cities planning major waterfront redevelopment must have an organized development mechanism which attempts to integrate public needs and interests in the waterfront while also being able to meet the demands of a private entrepreneurship necessary to produce a viable real estate result (Leo Molinaro, president of American City Corporation, in his keynote address to the Waterfronts '83 conference). American City Corporation's experience with and knowledge of over 100 cities having organized such mechanisms indicate that no one model has yet emerged which fits all cities and all projects (Breen and Rigby 1984b).

*Mixed Use/Festival Markets - Communities considering festival marketplaces as key elements in their waterfront redevelopment must realize that truly successful applications of this concept feature the marketplace as part of a larger setting that includes parks, marinas, museums or aquariums, housing, office space, and industry (Breen and Rigby 1984a). Five necessary ingredients for establishing a successful festival market are: market opportunity, access and location, amenities, a decision-prone city leadership, and money (Wallace 1984).

*Private Investment - Most successful projects have as a major key ingredient substantial private investments which are either directly or indirectly linked to the redevelopment proposals (Nat'l. Res. Council 1980).

*Comprehensive Planning - Communities must comprehensively analyze their entire shoreline, thinking creatively about multiple or mixed use; they must attempt to balance the various competing demands through innovative design and mitigation (Breen and Rigby 1984a). Communities must draw on an inexhaustible supply of creative energy and inventiveness, all the while maintaining a caring attitude toward their shoreline edges, their water and, most importantly, their people.

CONCLUSION

The urban waterfront redevelopment trend may be approaching its peak. Its weightiest problem has been cutbacks in federal funding programs which provided various alternatives to localities for planning and ultimately implementing their waterfront projects. While the mid 1980s may witness some leveling off of the number of new urban waterfront projects being launched across the nation, the enthusiasm of water-oriented communities for breathing vitality back into their waterfronts has never seemed stronger.

Admittedly, a number of major conflicts face communities wanting to board the urban waterfront band wagon, including the glowing successes of other cities blinding newcomers to the realities and uniqueness of their own

waterfronts. With the funding picture changing for waterfronts, cities are going to have to get even better at mixing and matching funds and services to make things happen. Numerous successes with private sector partners offer positive proof that waterfront communities can continue to keep the urban shoreline revitalization movement alive.

As mentioned previously, problem solving seems to be an integral part of the urban waterfront redevelopment success story. There is a strong precedent for imaginative and enthusiastic community leaders resolving problems capable of seriously inhibiting the return-to-the-waterfront movement. Unyielding commitment to conflict resolution, unique resource mixing and redevelopment visions focused on enhancing communities' "collective egos" will keep the urban waterfront trend on a positive track. With planning underway for Operation Sail 1986, the waterfront renaissance may even have to brace itself for another surge of enthusiasm.

LITERATURE CITED

- American City Corporation. 1984. Waterfront development projects. Prepared for Urban Waterfront's 84 Conference, Sept. 14-15, 1984, Wash., D.C.
- Anonymous. 1964. Renewal of waterfront areas presents special problems, brings special opportunities. *J. of Housing* 21:236-255.
- Anonymous. 1965. Beauty for America: Proceedings of the White House conference on natural beauty. Wash., D.C.: U.S. Government Printing Office.
- Balchen, B. and J. Linville. 1971. The city waterfront: ending an era of neglect. *Nation's Cities* 9:8-19.
- Basile, R. 1978. The Georgetown waterfront controversy: a conflict without resolution. *Environmental Comment (EC)*, (June):11-16. Wash., D.C.: Urban Land Institute.
- Breen, A. and D. Rigby. 1984a. Waterfronts in the 1980s: an overview. *J. of Housing* 41:78-82.
- Breen, A. and D. Rigby (eds.). 1984b. Urban waterfronts '83: balancing public/private interests. Conference summary 119 p. Wash., D.C.: The Waterfront Press.
- Breen, A. and D. Rigby (eds.). 1984c. Annual look at waterfront design issues. *Waterfront World* 3:3-5, 15.
- Breen, A. and D. Rigby. 1985. Urban waterfronts '84: toward new horizons. Conference summary. Wash., D.C.: The Waterfront Press (in press).
- Brown, P. 1981. Is South Street Seaport on the right tack? *Historic Preservation* (July/Aug.), p. 10-19. Wash., D.C.: National Trust for Historic Preservation.
- Clare, J., D. Eldridge and C. Kirkland-Webb. 1984. Jacksonville report. *Face-Piedmont Airlines*. p. 5-60. Greensboro, NC: Fisher-Harrison Publications, Inc.
- Clark, H. 1976. The tall ships: a sailing celebration. 128 p. N.Y.: Tree Communications, Inc. Helvetica Press, Inc.
- Cowey, A. 1979. The urban coast from a national perspective. *Coastal Zone Management Journal* 6:135-165.

- Della Bitta, D., D. Loudon, G. Booth and R. Weeks. 1977. The economic impact of the Tall Ships '76 celebration on Rhode Island. Marine Tech. Report No. 59, 35 p. University of Rhode Island, Kingston, RI.
- Department of Commerce (DOC). 1980. Improving your waterfront: a practical guide. Office of coastal zone management in cooperation with department of the interior, heritage conservation and recreation service, 108 p. Wash., D.C.: U. S. Government Printing Office.
- Department of Interior (DOI). 1977. A preliminary urban parks study. Heritage conservation and recreation service, 122 p. Wash., D.C.: U. S. Government Printing Office.
- Department of Interior (DOI). 1978. National urban recreation study. Executive report. Heritage conservation and recreation service, 184 p. Wash., D.C.: U. S. Government Printing Office.
- Department of Interior (DOI). 1979. Urban waterfront revitalization: the role of recreation and heritage. Vols. I & II. Heritage conservation and recreation service, Wash., D.C.: U. S. Government Printing Office.
- Department of Interior (DOI). 1981. Planning for urban fishing and waterfront recreation. Fish and wildlife service, FWS/OBS-80/35, 106 p. Prepared by Urban Wildlife Research Center, Inc. Wash., D.C.: U. S. Government Printing Office.
- Farrell, J. 1973. Economic impact of Block Island race week. Tech. Report No. 8, 18 p. University of Rhode Island, Narragansett, RI.
- Freedman, M. 1982. Waterfront revitalization in a new fiscal era. Real Estate Review 11:77-82. N.Y.: The Real Estate Institute of New York University.
- Galta, A. 1983. Down by the riverside. Hartford magazine (Nov.) p. 21-26;33. Hartford, CT: Hartford Magazine, Inc.
- Hanna, J., S. Phillipp and G. Mullins. 1978. Decision-making in the development of urban waterfronts for park/business use. Amer. Resources Bull. 14:179-189.
- Horn, J. (ed.). 1982. An urban waterfronts program for California: projects proposed for funding FY 1982-83. Urban waterfronts restoration program, 143 p. State Coastal Conservancy, Oakland, CA.
- Knecht, R. 1979. Waterfronts: rediscovering a neglected asset. American Institute of Architects (Feb.):54-58.
- Lucy, J. 1979. Virginia's coastal marina industry: a descriptive analysis. Va. Sea Grant Program, Va. Institute of Marine Science Contribution No. 957, College of William and Mary. In Proceedings of the second national boating facilities conference, Oakland, CA. p. 46-48. Univ. CA Sea Grant Program.
- Lucy, J. 1980. Waterfront festivals: potential for developing events on public lands and availability of technical services. Paper presented at Delaware's third Governor's conference on tourism and recreation. Va. Sea Grant Program, Va. Institute of Marine Science Contribution No. 966, 10 p. College of William and Mary, Gloucester Pt., VA.
- Lucy, J. 1981. Waterfront festivals: catalysts for maritime heritage and waterfront redevelopment. Va. Sea Grant Program, Va. Institute of Marine Science Contribution No. 1017, 8 p. College of William and Mary, Gloucester Pt., VA (reprinted In Current Municipal Problems 9:338-343).
- Lucy, J. and S. Baker. 1979. Harborfest '79 Norfolk, Virginia: analysis of patrons and their expenditures. Special Report in Applied Marine

- Science and Ocean Engineering No. 226, 25 p. Va. Sea Grant Program, Va. Institute of Marine Science, College of William and Mary, Gloucester Pt., VA.
- Lucy, J. and T. Vance. 1982. The 22nd Urbanna oyster festival: analysis of patrons and expenditures. Special Report in Applied Marine Science and Ocean Engineering No. 257, 11 p. Va. Sea Grant Program, Va. Institute of Marine Science, College of William and Mary, Gloucester Pt., VA.
- Moore, A., P. Childs, R. Boynton, and P. Stefan. 1971. Bright breathing edges of city life: planning for amenity benefits of the urban water resources. Dept. of Interior, Office of Water Resources, Project C-2141, Wash., D.C.: U.S. Government Printing Office.
- Moss, M. 1980. Staging a renaissance on the waterfront. New York Affairs 6:3-19 NY:New York University (Reprinted NY Sea Grant Program, NYSG-RR-80-33).
- National Research Council. 1980. Urban waterfront lands. Committee on urban waterfront lands. 243 p. Wash., D.C.: National Academy of Sciences.
- Orski, C. 1979. European cities: lessons we can learn. Commentary (April), p. 28. National Council on Urban Economic Development, Wash., D.C.
- Pettigrew, J. Jr. 1984. The waterfront revivals. Delta Airlines Inflight Magazine 31, p. 48-52. N. Miami, FL: Halsey Publishing Co.
- Reichert, A. and L. Lovell-Troy. 1978. The economic and social impact of the 1977 three rivers festival (unpublished report). 13 p. Fort Wayne, Indiana: Indiana Univ. - Purdue Univ.
- Southern Mississippi Planning and Development District. 1984. Biloxi waterfront: facts and opportunities, 90 p. City of Biloxi.
- Wagner, R. Jr. 1980. New York City waterfront: changing land use and prospects for redevelopment. In National Research Council. Urban waterfront lands, p. 78-99. Committee on urban waterfront lands. Wash., D.C.: National Academy of Sciences.
- Wallace, D. 1979. An insider's story of the inner harbor. Planning (Sept) (Special Conference Issue on Baltimore), p. 20-24. Chicago: The American Planning Assoc.
- Wallace, D. 1984. "Commentary," Many ingredients key to festival market success. Center City Report (Feb.) p. 3-4, 9.
- Wood, D. 1965. Renewing urban waterfronts. Land Economics 41:141-149.
- Wrenn, D., J. Casozza and J. Smart. 1983. Urban waterfront development. 219 p. Wash., D.C.: Urban Land Institute.

PATTERNS OF USE IN AN URBAN FOREST RECREATION AREA

John F. Dwyer, Herbert W. Schroeder, and Richard L. Buck¹

Abstract.--Estimates of use of a large urban forest recreation area revealed high levels of use (1,641,000 visitors over a 12-month period in a 3,700-acre area), as well as regular patterns of use. Models based on season (month), day of the week (weekend, Saturday, or Sunday/Holiday) and weather (sun, rain, or temperature) were successful in explaining about 75 percent of the variation in daily use at each of seven access areas. The results have been highly useful in efforts to prevent the area from being flooded, as well as for guiding the management of existing resources and planning for new developments.

Additional keywords: Traffic counters, models, predictions, management, planning.

Information on the use of urban forest recreation resources is sketchy. However, managers of urban forest recreation resources often need information about use levels to support continued use of the areas for recreation and to guide the allocation of scarce resources.

We measured use at a popular urban forest recreation area and developed models to predict use on any given day. We also identified regular patterns of traffic flow and vehicles on site at various times of the day. The results could influence site design (particularly parking areas and roads); the distribution of picnic tables, trash containers, and portable toilets; as well as the scheduling of maintenance and police patrol.

STUDY AREA

The Forest Preserve District of Cook County, Illinois, manages significant urban forest recreation resources for residents of the Chicago metropolitan area. It is responsible for more than 66,000 acres, which is 11 percent of a county of 5.5 million residents (Wendling et al. 1981). A proposed change in operating rules for a 590-acre flood control reservoir (Busse Lake) on District holdings threatens to flood some of the District's most significant resources. To assess the impact of an increased risk of flooding, the Forest Preserve District needed more precise information on recreational use of the 3,700-acre Ned Brown Forest Preserve where Busse Lake is located. The Preserve provides opportunities for a wide range of activities including pic-

¹The authors are Research Forester and Research Social Scientist at the North Central Forest Experiment Station in Chicago, Illinois, and Chief Landscape Architect, Forest Preserve District of Cook County, Illinois.

nickering, hiking, bicycling, observation of nature, boating, fishing, ice skating, cross-country skiing, and model airplane flying.

The Ned Brown Forest Preserve is located in the Chicago suburbs and is well served by major highways. There are seven access roads but no through routes. The study focused on motor vehicles because nearly all users arrive in motor vehicles. Also, the capacity of parking areas and the road system often limits use, thereby making these facilities and the motor vehicles that use them a logical focus for attention.

METHODS

Vehicles entering each access were counted by battery-operated traffic counters and by direct observation (hand-held counters) from May 1983 - April 1984. During direct observation counts of vehicles entering and leaving were recorded at 15-minute intervals. This permitted estimating flows into and out of the area during those intervals, as well as the number of vehicles on site at one time. One of the traffic counters kept counts over 15-minute intervals, while the others were read daily. Direct observation was used to correct the results obtained from the traffic counters. The results from traffic counters were consistent and corrections averaged less than 10 percent. Weather conditions were also recorded daily. The sampling scheme provided for sampling periods of 8 hours per day for 5 days per week, including nearly all weekends and holidays between May and October. The portion of the day sampled was varied to cover between 8:00 a.m. and 8:00 p.m. At any given time direct observations were made at one site and traffic counters were placed at four others. From November to April, counts were made with traffic counters in place for the entire daylight period.

RESULTS

Total use over a 12-month period was estimated to be 944,000 vehicles carrying 1,641,000 individuals. This amount of use supports the notion that the area is an important recreation resource. The highest daily use was 10,000 vehicles carrying 22,000 individuals. Many vehicles can use the area on a given day because of relatively short stays--averaging 1 hour on weekdays and 2 hours on weekends--which enable the same parking space to be used several times during a day.

Some people drive through an access area and stop only briefly, or perhaps not at all. Driving for pleasure is an important use of the Forest Preserves during all seasons; because of the relative newness of Busse Lake and the associated boating, fishing, picnicking, and trail facilities, many of the users drive through to investigate the area. Drive-through use appears to be especially important during winter, particularly when the weather is not favorable for outside activities. In the summer, patterns of use are particularly complex and appear to vary by activity. Fishermen often spend a brief time in the morning or evening, perhaps on their way to or from work or other activities. On weekdays many users stop by for lunch or dinner. At other times of the day sales representatives stop to fill out their paperwork or pass time before an appointment at one of the many nearby businesses. In the evenings, groups meet for softball games and picnics. On weekends, when stays tend to be longer, we observed the same picnic table being used by three or four successive groups throughout the day. Consequently, the number of

vehicles using the area on a particular summer weekend day may total three times the number of parking spaces.

Particularly heavy use, as expressed by number of vehicles entering per parking space, is found at relatively small access areas along major roads where the area is clearly visible from the road and those driving by can readily see if parking space is available. These are popular stopping off points for individuals traveling through the area. With relatively short stays, these areas can accommodate many users throughout a day.

The average number of individuals per vehicle in our study was less than what most recreation planners assume (up to 3.5). The planners' assumptions are generally based on average family size. However, many of the vehicles entering the area do not carry families, particularly on weekdays when the average number of individuals per vehicle is less than 1.5. On weekends the average number of individuals per vehicle approaches 2.25. Motorcycles are an important means of reaching the access areas (5-10 percent of vehicles), but carry only one or two individuals, also tending to reduce the average. Many visitors come from short distances and apparently find it convenient to meet others at the site rather than travel as a group in a single vehicle. In addition, household sizes have decreased significantly since many studies of people per vehicle were reported in the research literature. Consequently, planners should note that with fewer individuals per vehicle, a given parking area will provide for fewer users at one time than was previously thought.

Seasonal patterns of use

Use peaks in early June when a sunny Sunday afternoon can lead to jammed parking areas and roads. Then it generally declines through the summer and rather abruptly drops at summer's end (Figure 1). Use increases somewhat in winter, but monthly averages do not exceed one-third to one-fourth of summer use. Some of the access areas are not plowed after a snowfall, but this does not greatly influence overall use. Winter weekends do not bring the big increases in use that characterize summer weekends and there is relatively little difference between Saturdays and Sundays. Although winter use is much lower than summer use, average daily use during a winter month never drops below 1,000 individuals. In April and May use begins to increase sharply and sunny weekends can bring large crowds. Consequently, preparations for peak use should be completed early in the spring.

Within-day patterns

Patterns of use throughout the day are highly predictable, but distinctly different for weekend and weekday use (Figure 2). On summer weekends, the number of vehicles on site, as well as the flows of vehicles into and out of the area, tends to peak in the afternoons. On weekdays the number of vehicles on site, as well as the flow of vehicles into and out of the area, tends to peak at noon and in the early evening. In the winter, use peaks earlier in the day and drops off more rapidly in the afternoon as the days are shorter and temperatures tend to fall off quite rapidly.

The distinctiveness of within-day use patterns varies somewhat over the access areas. Areas near businesses tend to draw large noontime crowds on summer weekdays and smaller crowds in the winter. Areas with good sites for playing

softball tend to draw crowds on summer evenings. Areas that provide opportunities for fishing tend to draw users early in the morning during most seasons as well as on summer evenings. An area that provides access to a trail through a wooded area is particularly popular in the winter, presumably because the trees offer shelter from the wind as well as an attractive environment. Consequently, patterns of use are particularly useful for scheduling maintenance and police patrol.

Traffic flows

Because of the high use, short stays, and concentration of use during certain times of the day, there is a substantial flow of vehicles through the access areas at particular times. On a busy weekend the largest access area may receive vehicles at 5-second intervals for sustained periods. During that time vehicles are often leaving at a similar rate. High flows near this rate also occur briefly on summer weekdays at noon and in the early evening. Consequently, careful design of roads, parking areas, and the intersections of access roads with main highways is critical; as is the need for police to direct traffic at some times.

MODELS FOR PREDICTING USE

To assist the Forest Preserve District in anticipating high-use periods in future years and to schedule their activities, we developed statistical models for predicting daily use. Models including the season (month), day of the week (weekday, Saturday, or Sunday/Holiday), and weather (sun, rain, or temperature) explained about 75 percent of the variation in daily use at each of the access areas. Separate models were developed for winter and summer. In the winter model, rain was deleted and temperature was added as an explanatory variable.

Temperature was not a useful explanatory variable in the summer model, and snow conditions were not useful in the winter model. We suspect that the temperature variable is not significant in the summer because opportunities for swimming and other water contact sports are not provided at Busse Lake. Snow conditions and winter activity may not be associated because snow brings about changes in the mix of use rather than in the amount of use. For example, when there is snow, the trails are often used for cross-country skiing. Without snow, those same trails are used for jogging and bicycling.

In summer the highest use occurs on sunny Sundays in June. Slightly lower use can be expected on Saturdays, and weekday use is less than half of that on weekends. A sunny day can bring out 80 percent more use than a day without sun; on a rainy day use drops to one-half of that on an entirely cloudy day. Sunshine has a very strong correlation with winter use, and temperature is also strongly correlated with winter use.

The multiple linear regression models developed for predicting summer and winter use have a complicated form. To increase their usefulness to managers, they have been translated into interactive computer programs and tables--both of which have been provided to the District. The table for the Boat Dock Access, the largest and most heavily used access area, is provided below (Figure 3). The models can also be programmed into a hand-held computer for use by managers and planners.

The Ned Brown Forest Preserve receives much use. The patterns of daily use including vehicles using the site, number of vehicles on site, and flows of vehicles into and out of the area are relatively easy to predict at any one of the seven access areas on any given day. Knowing these regular patterns and being able to predict use can help managers decide where to build particular facilities, how to design the site, and schedule maintenance and police patrol at the Ned Brown Forest Preserve.

The regular patterns of use at the Ned Brown Forest Preserve suggest that only limited sampling would be needed to update use information. If these same patterns persist in other Forest Preserves, then a limited sampling program should be effective for estimating use and developing models to predict use throughout the system. Expansion of the research to a wider range of sites would greatly improve our knowledge of and ability to predict user behavior.

The current information is useful for identifying use patterns at existing access areas in the Ned Brown Forest Preserve. It has implications for the management of those sites because the access areas are similar, but offers few guidelines for site design beyond parking areas and roads. Other research has shown that urbanites prefer particular urban forest recreation environments (Allton and Lieber 1983, Anderson and Schroeder 1983, Dwyer, Peterson, and Darragh 1983, Kaplan 1981, Lieber and Allton 1983, Lieber and Fesenmaier 1983, Peterson, Dwyer, and Darragh 1983, Schroeder 1982, Schroeder 1983). It would be useful to build models to predict use of particular areas based, in part, on site characteristics such as portion of the area in grass, number and size of trees, presence of a trail, river, or lake, etc. These models would enable a planner to decide on the capacity of the parking/road system necessary for a particular area, or the changes in that system that might accompany a modification of the site. Our experience suggests that these models may be quite complicated and might require the following information about nearby areas: traffic on adjacent roads, residential population, workers in nearby establishments, and the availability of other recreation areas that provide similar opportunities.

With a little effort and cost, we were able to provide useful information to planners and managers. They have begun to use the figures to help counter efforts to change the operating rules for Busse Lake and increase the risk of flooding; as well as to guide the management of existing facilities and the development of new ones. We suggest that other managers of urban forest recreation resources consider implementing similar monitoring programs. Our findings suggest that urban forest recreation use falls into definite patterns. It would be useful to examine the patterns in other areas as well.

LITERATURE CITED

- Allton, D. J., and Lieber, S. R. 1983. Attributes of Chicago trail areas. *Leis. Sci.* 5(3): 197-220.
- Anderson, L. M., and Schroeder, H. W. 1983. Application of wildland scenic assessment methods to the urban landscape. *Landscape Planning* 10: 219-237.
- Dwyer, J. F., Peterson, G. L., and Darragh, A. J. 1983. Estimating the value of urban forests using the travel cost method. *J. Arboric.* 9(7): 182-185.
- Kaplan, R. 1981. Evaluation of a vest-pocket park. USDA Forest Ser. Res. Pap. NC-195, 12 p. North Central Forest Exp. Stn., St. Paul, MN.
- Lieber, S. R., and Allton, D. J. 1983. Modeling trail area evaluations in metropolitan Chicago. *J. Leisure Res.* 15(3): 184-202.
- Lieber, S. R., and Fesenmaier, D. R. 1983. Modelling recreation choice: A case study of management alternatives in Chicago. *Regional Studies.* 18(1): 31-43.
- Peterson, G. L., Dwyer, J. F., and Darragh, A. J. 1983. A behavioral urban recreation site choice model. *Leisure Sci.* 6(1): 61-81.
- Schroeder, H. W. 1982. Preferred features of urban parks and forests. *J. Arboric.* 8(12): 317-322.
- Schroeder, H. W. 1983. Variations in the perception of urban forest recreation sites. *Leis. Sci.* 5(3): 221-230.
- Wendling, R. C., Gabriel, S. J., Dwyer, J. F., and Buck, R. L. 1981. Forest preserve district of Cook County, Illinois. *J. For.* 79(9): 602-605.

the week. This is an estimate of the number of vehicles that would enter if the day was 100 percent cloudy.

2. If the weather is not 100 percent cloudy, but includes sunny or rainy periods, multiply the number from Table A by the appropriate correction factors from Table B.

Table A.--Vehicles expected on a cloudy day

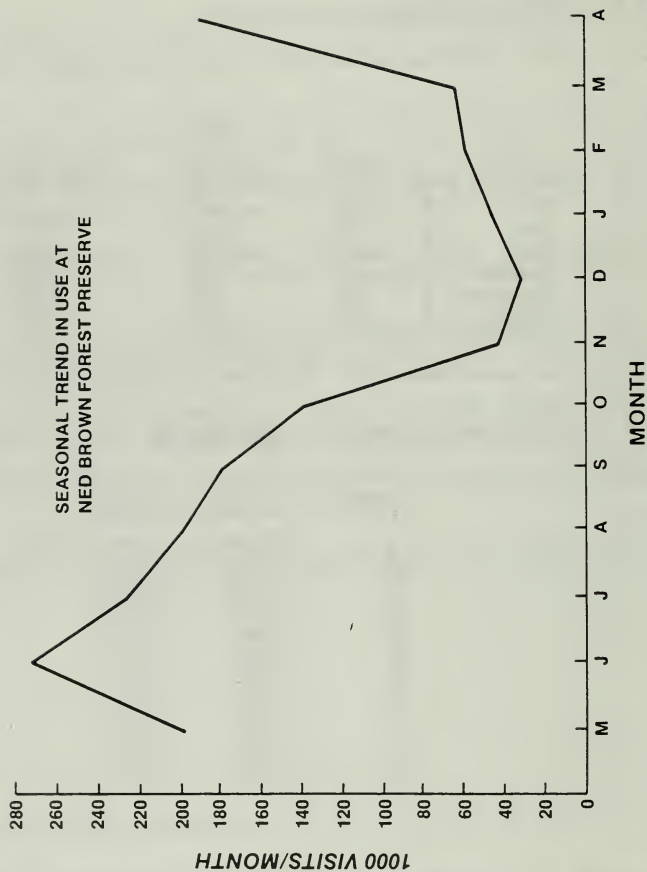
Month	Day		
	Weekday	Saturday	Sunday/Holiday
May	660	1,264	1,989
June	705	1,349	2,124
July	662	1,268	1,996
August	472	904	1,424
September	354	677	1,066
October	243	465	732

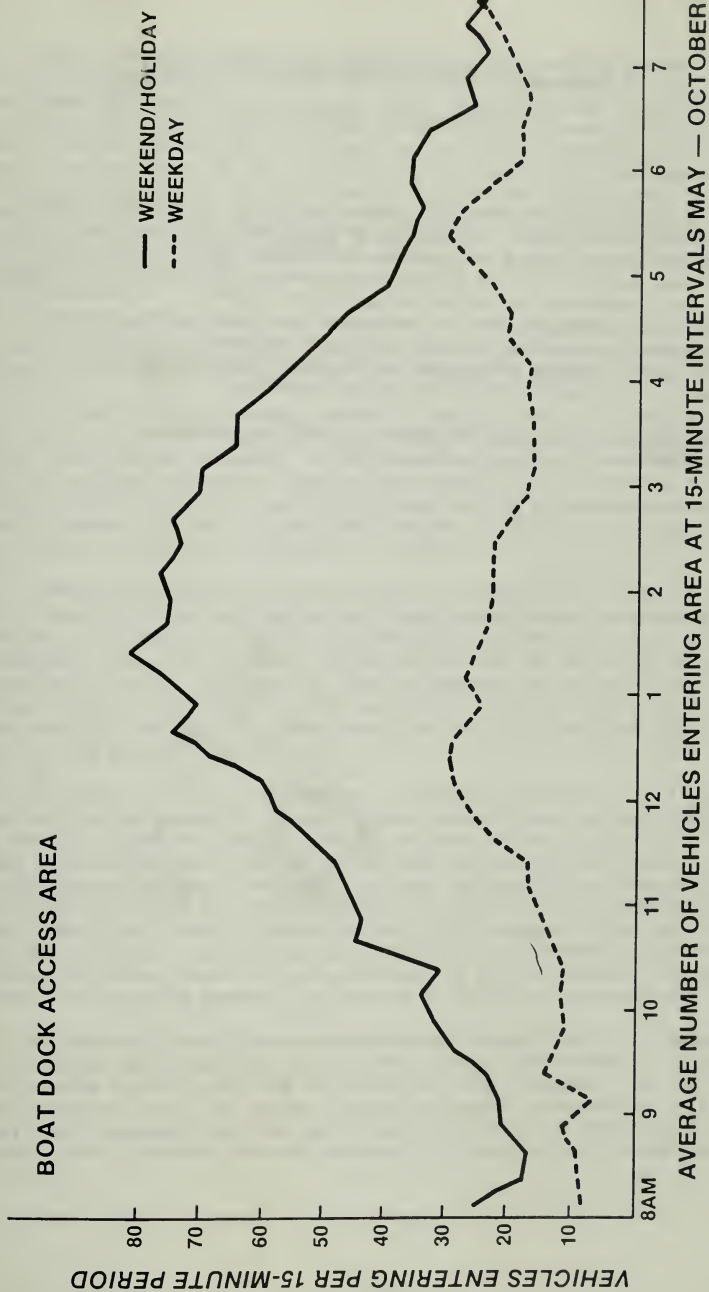
Table B.--Corrections for sunny and rainy weather

Percent	Sun	Rain
0	1.0000	1.0000
10	1.3576	0.7263
20	1.4742	0.6663
30	1.5493	0.6325
40	1.6055	0.6094
50	1.6508	0.5919
60	1.6889	0.5779
70	1.7219	0.5663
80	1.7511	0.5565
90	1.7773	0.5479
100	1.8011	0.5403

For example: To estimate the number of vehicles entering the Boat Dock Access Area on Sunday in June with 40 percent sun and 10 percent rain, our result would be $2,124 \times 1.6055 \times .7263 = 2,477$ vehicles.

Figure 3.--Procedures for estimating the number of vehicles entering the boat dock access area during a day (8:00 a.m. - 8:00 p.m.)





A MODEL OF NON-USE OF URBAN LEISURE SERVICES

By Geoffrey Godbey

Abstract.--The issue of nonparticipation in public leisure services is explored through the presentation of a model and the examination of data from two recent studies within the framework of this model. Lack of awareness was found, within both studies, to be a prevalent condition among nonparticipants. An argument is made that combating lack of awareness is a more cost-effective method of increasing participation than attempting to alter services to enable participation by those who know about such services but are prevented from participating.

Keywords: Public Leisure Services, Non-Use, promotion, awareness

There is considerable agreement among leisure scholars that the concept of recreation "need" or "demand" is inherently pluralistic. That is, any legitimate attempt to conceptualize these terms involves differing assumptions and methods of measurement (Mercer 1973). Leisure "need" or "demand" in a public policy context may be thought of as: 1) prescribed quantities of facilities and services in relation to a population; 2) the comparative geographical distribution of these facilities and services in relation to social indicators of leisure service dependency, e.g. poverty; 3) the activities people state they wish to engage in 4) people's actual participation patterns; or 5) any leisure experience in which people can be interested to the point where they will participate (Godbey 1980).

While these concepts vary radically in the assumptions they make about society, all have been used to some extent in planning and evaluating local, state, or federally sponsored leisure services in North America.

By far, the most common concept of leisure "need" or "demand," however, is "expressed need." That is, people exhibit what they want to do or need to do by their actual behavior. While there are obvious, serious limitations to such an assumption, it fits well within North American ideology of self-determination and upward mobility, to say nothing of mass consumerism. A public leisure service, in the final analysis, is most likely to be judged based upon attendance, visitation, or usage.

Howard and Crompton (1980) pointed out that, even though recreation and park administrators have historically used quantitative measures of participation as the basis for justifying budgets, such an approach is conceptually inadequate since such data are often inaccurate, do not always equate with satisfaction among participants, ignore concepts of ecological and social carrying capacity, may reflect only the state in the life cycle of a given leisure service, and may be inappropriate for services targeted for a small segment of the population.

In spite of these shortcomings, attendance continues to be the most often used evaluative measure. In making such evaluations, an ideal model of usage is rarely specified. The most common macro-level assumption is often simply that more participation is better and less is worse. Sometimes, at the micro or site-specific level, attempts are made to establish a "carrying capacity" for a given leisure site which assumes an upward limit of participation based upon ecological, safety, health, or aesthetic reasons. Even in these circumstances, however, more participation is still considered better up to the saturation point. While client satisfaction is increasingly recognized as a relevant evaluation measure, attendance is still the *sine qua non*.

In general, local government-sponsored leisure service organizations seek to encourage participation (as do most private leisure service organizations) and to view nonparticipation as a problem to be overcome. At the micro-or site-specific level, of course, nonparticipation is necessary. If all potential users suddenly begin to use a park or library, it would collapse. At the system level, however, nonparticipation is almost always viewed as a problem.

Non-use of public leisure services has been raised as an issue which may indicate a lack of citizen participation in the planning of such services, e.g., Gold, 1976. There have also been a number of studies which examined barriers to participation (Mueller, Gurin and Wood 1962; Bangs and Moeller, 1970; University of Wisconsin College of Agricultural and Life Sciences, 1974; McLean and Hermanson, 1974; Grubb, 1975; Hatry et al, 1977; Nationwide Outdoor Recreation Survey, 1977).

Most of these studies, however, did not examine the respondent's information level concerning what leisure services existed. Additionally, most did not ask about barriers to participation in regard to specific leisure services. Because of these limitations, it was difficult to determine the extent to which respondents were aware of the range of specific leisure services available to them. One exception to this was a study by Spotts and Stynes (1984) which examined the familiarity of residents of Lansing, Michigan, with local parks. The findings indicated that lack of awareness of the existence of local parks and their features was fairly widespread. For instance, of 19 local parks, the majority of respondents were uncertain or had never heard of nine of them. Another study, which examined users and non-users of public leisure services in Dade county, Florida; Austin, Texas; and Springfield, Oregon (Howard and Crompton, 1984) found "The most frequent reason cited by low income adults for their lack of participation was a lack of awareness of services available to them."

In summary, nonparticipation in public leisure services has generally not been examined within any conceptual model nor has lack of knowledge concerning what exists. Where lack of knowledge has been examined, its impact was significant.

A MODEL OF NONPARTICIPATION IN LEISURE SERVICES

Why don't people participate in public leisure services? What can be done to encourage greater participation? Should greater participation be encouraged? While these questions are not all wholly questionable, the following model, based upon recent studies undertaken in two urban areas in the Eastern United States, provides some initial framework for answering these questions. Both studies dealt with nonparticipation in the services of a public leisure service agency.

The Studies

The first study, undertaken in a region of a large city in the Eastern United States, examined extent and reasons for nonparticipation in recreation and park services, awareness levels, and the demographic profile and reading habits of respondents. A mailed questionnaire was designed in cooperation with the participating agency using the Dillman Total Design Method (1978). After pilot testing, the questionnaire was mailed to 1490 households from which a final return rate of 62% was achieved. This resulted in a sampling error of plus or minus two percent.

The second study, funded through the Urban Park and Recreation Recovery Act, utilized a telephone interview to a systematic sample of 1658 households drawn from telephone directories in an eastern, urban county. Of these, 398 had disconnected phones, an answering service, or could not be reached. Of the 1260 contacted, usable, completed interviews were obtained from 550 (44%). The interview sought to examine extent and reasons for nonparticipation in recreation and park department services, awareness levels, and the extent of non-users' desire to participate. Interviewing was done by agency staff who had undergone training and/or were experienced in telephone interview procedures.

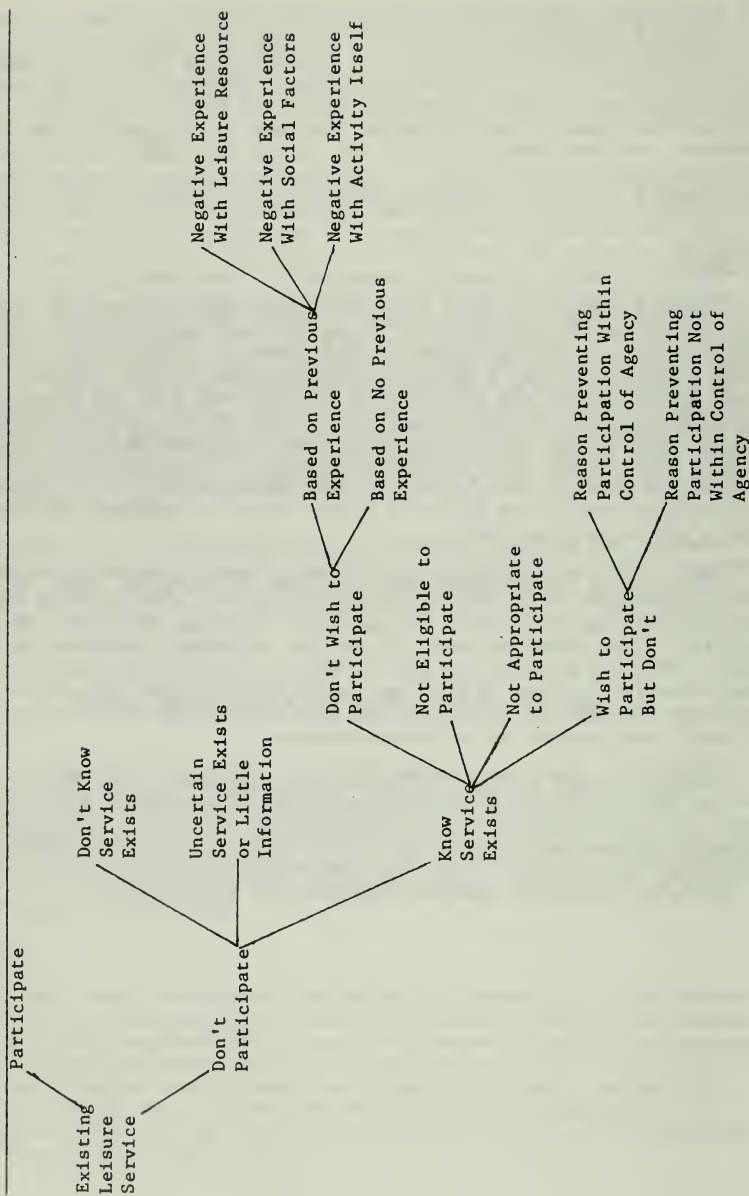
The Model

Figure 1 presents a model which identifies the categories of nonparticipants in a given leisure service. As may be seen, nonparticipants may be subdivided into those who are unaware a given service exists, those who have a little information about a service or are uncertain of its existence (but not enough information to use the service) and those who know the service exists (enough information to use the service). Those who have a "functional" awareness of a service may be further sub-divided into those who don't wish to participate (but could), those who are not eligible to participate, e.g., a male on a women's softball team; those for whom participation is not appropriate, e.g., a first-time tennis player in a city tennis tournament, and those who wish to participate but don't.

Two of these sub-divisions may be further delineated. Those who know a service exists but don't wish to participate may not wish to do so based on some previous experience which was negative. That is, they tried the activity, didn't like something about it, and are no longer interested in participating. What was disliked may have to do with the leisure resource itself, negative social factors, or they may simply have disliked the activity itself. Others may not wish to participate who have never tried the activity. They may simply not perceive it as being appealing.

Finally, we may further sub-divide those who wish to participate but don't as being prevented from participating by reasons which are, to some extent, within the control of the sponsoring agency, e.g., site hours of operation inconvenient, or they may be prevented by reasons over which the agency has little control, e.g., the individual lacks time to participate. The following discussion examines this model in more detail.

Figure 1
A model of nonparticipation in Leisure Services



In terms of nonparticipation in public leisure services, lack of knowledge or awareness was found to be quite common. Tables 1 and 2 show the percentage of households in a region of City A and Urban County A in which respondents were unaware of the existence of several public leisure services. While it may not be appropriate for all residents to be aware of all services, lack of awareness is a prevalent condition in respect to facilities which are intended for the entire population, such as environmental centers.

Of those who know about a service but don't participate, some wish to participate and others do not. These categories are not rigid, however, and are sometimes subject to misinterpretation. For example, some respondents may say, "I am not interested in participating because the service is provided at an inconvenient location," when the more appropriate answer may be, "I would like to participate, but it's too far away." Conversely, some who say they wish to participate but don't will specify "lack of time" as the limiting reason when a more appropriate answer would be: "I'm not interested enough to give up any of my other leisure activities."

Table 3 shows a listing of reasons respondents gave and frequency of response when asked in an open-ended question why they didn't participate in various specific leisure services. As may be seen, these reasons may be categorized into those which the public leisure service agency has a high potential to change and those which the agency has little potential to change. While any such categorization is judgmental, it is apparent that some reasons for nonparticipation are clearly within the power of the agency to change. For instance, reasons such as "site poorly maintained," "site hours of operation inconvenient," or "fees and charges too high," are ones which an agency could potentially act upon, while reasons such as "lack of time" or "don't like other users at the site" would be more difficult to change.

Table 1.--Percentage of households in City A unaware of service, using service, wishing to use or not wishing to use

	1 None of Us Has Heard Of It	2 One or More of Us Have Visited or Participated During Last 12 Months	3 One or more of Us Would Like to Visit or Participate But Can't	4 We Don't Wish to Visit or Participate
RECREATION AND PARK SERVICES				
<u>Community Recreation Centers</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
A	41	11	5	43
B	41	7	6	46
C	28	39	4	27
D	20	40	5	35
E	32	24	6	40
F	40	22	5	33
G	35	25	8	32
H	39	6	5	50
<u>Pre-School Programs</u>				
A	46	6	4	44
B	48	4	5	43
C	43	9	5	43
<u>Special Facilities</u>				
Zoo	5	72	9	14
Facility A	8	59	14	19
Facility B	8	62	12	18
<u>Skating Rinks</u>				
A	12	41	16	31
B	7	17	12	54
<u>Nature Division</u>				
A	38	22	11	29
B	32	32	10	26
<u>City-Wide Special Events</u>	5	67	9	19
<u>Community Special Events</u>				
Festivals, Concerts	19	59	5	17
<u>Senior Citizen Centers</u>				
A	34	13	6	47
B	33	12	5	50
C	35	7	6	52
D	27	18	8	47
E	37	5	6	52

Table 2.--Awareness of services among respondents in urban County A

<u>Recreation and Park Services</u>	<u>Aware of Service</u>		<u>Not Aware</u>	
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
Tennis Programs	315	59	215	41
Zoo	477	91	50	9
Community Center A	62	12	436	88
Community Center B	65	13	430	87
Summer Recreation Programs	198	40	298	60
Senior Citizen Centers	196	40	290	60
Permits	298	60	202	40
Skating Center A	328	67	164	33
Skating Center B	378	75	123	25
Golf Courses	292	60	191	40
Environmental Center	176	36	310	64
Special Populations Exercise Program	100	22	362	78
Senior Fitness	98	20	382	80

Those who don't wish to participate but know the service exists are most likely to say they are simply "not interested." This lack of interest may mean that the individual has no experiential referent with regard to the activity but conceptualizes it as being unappealing, or that the individual has tried it but doesn't like it. One of the ironies of leisure behavior is that individuals often don't know if they will like a new form of leisure experience until they've tried or been socialized into it. Some of those, then, who say "not interested," may have the potential to be interested. It should be noted from Table 1 that, in almost every leisure service examined, the percentage of respondents who knew a service existed but did not wish to participate was less than half. Stated another way, in almost every leisure service examined, the majority of respondents wished to participate, did participate, or were unaware of the service. This would seem to have great significance in that 1) the portion of the public served is far greater than some previous

studies indicated, e.g., Carberry, (1975), Gold (1976), and (2) a minority of the public is clearly not interested in participating. Lack of awareness is a prevalent condition in respect to facilities which are intended for the entire population, such as environmental centers.

Finally, we find nonparticipants who are not eligible, e.g., males for a female softball team, or those for whom participation would not be appropriate, e.g., a two-year-old child in an urban gardening program.

Table 3.--Reasons for nonparticipation in specific leisure services in City A by rank and frequency*

<u>Rank</u>	<u>Reason</u>	<u>N</u>
1	Site Location Inconvenient	47
2	Lack of Sufficient Interest	43
3	Lack of Time	40
4	Personal Health Reasons	37
5	Use Alternative Facility or Program	32
6	Fear of Crime at Site	28
7	Lack of Skill--Don't Know How To Do Activity	18
8	Site Too Crowded	16
9	Lack of Transportation--No Car	15
10	Lack of Money	12
11	Lack of Public Transportation	9
11	Fear of Crime Traveling To and From Site	9
13	Site Poorly Maintained	8
14	Don't Know Enough About Site	7
14	Too Old	7
16	Site Hours of Operation Inconvenient	4
17	Site Polluted	3
17	Don't Know Anyone at Facility or Program	3
17	Don't Have Other People To Do Activity With	3
17	Don't Like Program Leader or Staff	3
21	Activities Not Interesting	1

*Reasons given by those respondents who knew of the existence of the specific leisure service in question, indicated they wished to participate but were prevented from doing so. More than one reason could be given.

INCREASING PARTICIPATION

If staff of a leisure service agency wish to increase participation in agency services, they may seek to stimulate such participation from any of the sub-groups in Figure 1 that don't currently do so. (They may also, of course, seek to encourage greater frequency of participation of those who are already involved). In encouraging participation among those who don't currently do so, a major question is which sub-group to target. The agency staff may either: 1) inform those who don't know a service exists, that it does; 2) seek to eliminate the barriers which prevent those who know a service exists, wish to participate, but are prevented from doing so, or 3) seek to persuade or interest those who know a service exists but don't wish to participate that they should do so.

While any comprehensive strategy for increasing participation will likely have some elements of each of the above courses of action, it would appear that informing those who don't know services exist would be the most cost-effective strategy, at least in the cases presented here. Table 4 shows the number and percentages of households in an eastern urban county who were either: 1) unaware various specific leisure services existed, or 2) aware the service existed, wished to participate, but didn't (sometimes called "latent demand"). As may be seen, the ratio between "unaware" households and "aware, interested, but unable to participate" households is often 20 to 1. Furthermore, many of the reasons cited by those who are "aware, interested, but unable to participate," such as "lack of time" and "personal health reasons" are highly unlikely to be changed by the leisure service agency. If one-half of all such reasons preventing participation are beyond the control of the agency, there might then be a ratio on the order of 40 who are unaware of a given leisure service to one who would like to participate but can't due to some reason which is within the power of the agency to change.

It would appear to make more sense to try to inform the 40 who don't know the program exists than to try to modify the existing service to facilitate the one. Also, it would increase participation just as much if only one out of the 40 who now knows about the service began to participate. If two of the 40 begin to participate, 5%, it would double the amount of new participation. Since, among households who knew about the various services, participation rates in given services were generally much higher than 5% (in some cases over 50%), it may be realistic to make the previous assumption concerning new participation. While it may be argued that some who were unaware of a service didn't seek out information since they weren't interested, many may simply not have known where to find such information.

Also of interest is the fact that those with low information levels about public leisure services were found, in both studies, to be disproportionately either of low or middle-low socioeconomic status. Therefore, additional publicizing of leisure services may serve to further democratize the use of such services. While both studies found that those with low information levels about department services were less likely to read newspapers than those with higher levels of information, they also found that those with low information levels were more likely to watch television and listen to the radio.

Table 4.--Comparison of two circumstances regarding nonparticipation in urban
County A

Recreation and Park Services	Unaware of Service		Aware of Service, Wish to Participate But Don't		Ratio
	N	%	N	%	
Tennis Programs	215	41	17	2	20.5 to 1
Zoo	50	9	40	7	1.29 to 1
Community Center A	436	88	6	1	88 to 1
Community Center B	430	87	7	1	87 to 1
Summer Recreation Programs	298	60	12	2	30 to 1
Senior Citizen Centers	290	60	10	2	30 to 1
Permits For Park Use	202	40	10	2	20 to 1
Skating Center A	164	33	17	3	11 to 1
Skating Center B	123	25	21	4	6.25 to 1
Golf Courses	191	40	8	1	40 to 1
Environmental Center	310	64	24	4	16 to 1
Services to Special Populations	362	78	5	1	78 to 1
Senior Fitness Programs	382	80	11	2	40 to 1

ADVERTISING PUBLIC LEISURE SERVICES

The most prevalent reason for non-use of public leisure services would appear to be that people simply don't know they exist. The complexity and fragmentation of modern urban life often means that there is a lack of knowledge concerning that which is in close proximity or that which is of obvious interest. As public leisure service administrators increasingly recognize this, they are beginning to inform, market, and advertise to the public in much the same way as the commercial leisure service sector. The historic opposition between commercial and public recreation, park and leisure services has almost completely disappeared in North America. As this has happened, it is logical to expect more similarity in methods of informing and promoting services.

While public leisure service agencies are unlikely to be able, at the macro systems level, to specify an ideal in terms of percentage of the population who utilize various leisure services, it does appear possible to specify an ideal in terms of the process: RESIDENTS OF EVERY HOUSEHOLD SHOULD MAKE DECISIONS CONCERNING PARTICIPATION BASED UPON A FUNCTIONAL AWARENESS OF THOSE SERVICES WHICH ARE AVAILABLE TO THEM. While proponents of "leisure education" have advocated the loftier goals of exposing individuals to a wide variety of leisure behavior, there would seem to be an obvious link between knowing what exists and experiencing it. Knowing what is available to you, in fact, represents a form of leisure education or leisure counseling, and public leisure service agencies in North America are moving quickly in this direction. It is also likely that new efforts to inform the public will do so by nontraditional means, such as the use of radio and cable and non-cable television (advertising as well as public service announcements), development of identifiable logos and symbols for departments, and promotions in shopping malls. While this approach may be objected to on the grounds that it minimizes the difference between commercial and public sectors, there is increasing evidence that the public doesn't care who is the provider of leisure services.

A marketing approach to public leisure services, in summary, must mean not only that participant satisfaction is an important measure in evaluating the success of an agency (Howard and Crompton, 1980), but also that the agency's services be effectively communicated to the public.

REFERENCES

- Bangs, Herbert P. and Stuart Mahler, 1970. Users of Local Parks. Journal of the American Institute of Planners, 36(5): 330-334.
- Carberry, Michael, 1975. Activity Analysis: A Research Tool for Planning Leisure and Recreation Services. Nashville, Tennessee. Department of Conservation Planning and Development Division.
- Dillman, Don A., 1978. Mail and Telephone Surveys: The Total Design Method. New York: Wiley-Interscience.
- Godbey, Geoffrey, 1980. "Categories of Recreation Need," in Gold, Seymour. Recreation Planning and Design. New York: McGraw-Hill, pp. 194-195.

- Gold, Seymour, 1976. The Fate of Urban Parks. Parks and Recreation (October): 12-17, 36-40.
- Grubb, E. A., 1975. Assembly Line Boredom and Individual Differences in Recreation Participation. Journal of Leisure Research, 7(4): 256-259.
- Hatry, Harry P., et al, 1977. How Effective Are Your Community Services? Washington, D.C.: The Urban Institute.
- Howard, Dennis R. and John L. Crompton. Financing, Managing and Marketing Recreation and Park Resources. Dubuque, Iowa: William C. Brown Company, 1980.
- Howard, Dennis R. and John L. Crompton, 1984. Who Are the Consumers of Public Park and Recreation Services? An Analysis of the Users and Non-users of Three Municipal Leisure Service Organizations. Journal of Park and Recreation Administration. 2(3), pp. 33-48.
- McLean, Christene and Dennis Hermanson, 1974. Leisure Services: The Measurement of Program Performance. Nashville, Tennessee. Urban Observatory of Metropolitan Nashville University Centers.
- Mercer, David, 1973. The Concept of Recreation Need. Journal of Leisure Research. 5(1), pp. 37-50.
- Mueller, Eva; Gerald Gulrin and Margaret Wood, 1962. Participation in Outdoor Recreation: Factors Affecting Demand Among American Adults. Outdoor Recreation Resources Review Commission Study Report 20. Washington, D.C.: Government Printing Office.
- Nationwide Outdoor Recreation Survey, 1977. Washington, D.C.: Heritage Conservation and Recreation Service, United States Department of Interior.
- Spotts, Daniel M. and Daniel J. Stynes, 1984. Public Awareness and Knowledge of Urban Parks: A Case Study. Journal of Park and Recreation Administration. 2(4), pp. 1-12.
- University of Wisconsin, College of Agricultural and Life Sciences Research Division, 1974. Characteristics and Recreational Participation Patterns of Low Income, Inner-city Residents. Madison, Wisconsin.

Thomas A. More¹

Abstract.--Urban parks are a complex, diverse recreational resource varying in size, shape, social function, physical and aesthetic attributes, and location within a city. User populations also vary across times and days of the week as well as seasonally. These factors need to be considered when evaluating use data for trend analysis.

Additional keywords: Benefits, activities, amenities, research methods.

Although urban parks form a major component of our nations' recreation estate, our conceptual understanding of these parks and the publics they serve has lagged behind that of other recreation resources. While some reasons for the lack of research on urban parks may be understandable (Dunn 1981), a consequence, at least in my opinion, is that many communities fail to derive maximum benefit from their park systems. If we better understood urban park systems, the users they serve, and the benefits they provide, we could better advise communities about the consequences of alternative park developments. These are the issues I address in this paper.

Such understanding may not come easily. To achieve it we must recognize that major differences exist between urban parks and rural recreation resources; so much so, in fact, that researchers cannot always approach them in the same way. With resource-based recreation resources, the resources may be relatively closely equated with the activities they supply; there is a uniformity among users and even among areas that greatly facilitates research. For instance, when we interview campers in developed campgrounds, we can be relatively certain that the majority of people we encounter will be there to have a particular kind of experience; although there will be important individual differences, there also will be a common body of shared characteristics and experience across the population of users. Moreover, although there are some differences between campgrounds, their design and the facilities they provide still will be reasonably comparable.

A vastly different situation applies with urban parks. In the city, we supply space, and people make what use of it they will. Although many urban parks do contain specialized facilities that structure them somewhat, there is still great variability. For example, in one study of central city park users I documented approximately 156 different activities occurring on a little more than 40 acres of urban open space during two summer months (More 1985). With users doing everything from walking the dog to playing frisbee to bathing in the fountains, how is one able to make broad, general statements about them? This highlights the difficulty: in studies of resource-based recreation we are essentially examining an *activity*; in studies of urban parks we are studying a resource--a resource surrounded by some of the most varied and interesting kinds of people in the world. Until we adequately come to grips with the variation in both the urban park resource and the people it serves, our studies will be limited.

¹Social Scientist, USDA Forest Service, Burlington, VT 05401

The lands managed by urban park and recreation departments are immensely diverse. They range from tiny sites that are little more than traffic islands to huge parks of several hundred acres. Some are intensively developed for organized recreation, others have been left primarily in a natural state. Some are beautifully decorated with ornamental fountains, flowerbeds, and statuary, others are littered with beer cans and broken glass. Such an array of variables makes it difficult to classify parks into meaningful conceptual categories. Many can be grouped, however, into one of four dimensions that influence people's park use: size, activity resources, amenity resources, and aesthetics.

The lands managed by urban parks departments vary strikingly in size. While examining the park systems of two small to medium sized Massachusetts cities (Holyoke, pop. 44,819; and Fitchburg, pop. 39,332), I found over 50 percent of the parks in each city were less than 1 acre in size (Table 1). Moreover, in each city, all these small parks combined produced less than 20 percent of the total recreation usage of the system. This is hardly surprising, of course, since larger parks often have more facilities for attracting people than do small parks. However, park size may be an important determinant of other benefits, especially those captured by property values (see below). Size may also determine the cost-effectiveness of park operation: although we have little reliable cost data for urban recreation, park managers complain that small parks are relatively expensive to maintain because equipment cannot be stored there and crews must travel to them. Thus, the cost of maintaining small parks which receive little recreation use may seem high.

Table 1.--Distribution of park size and use levels

Size class	Holyoke (n=50)	Fitchburg (n=29)	High	Range of use ^a				
				Holyoke Low	Mean	Fitchburg High	Low	Mean
< 1 acre	25	18	736	2	156.8	359	0	84.2
1 to 5 acres	15	5	1189	37	373.5	793	281	587.2
6 to 10 acres	4	2	807	18	264.2	310	150	230.0
11 to 25 acres	5	1	2942	648	1650.6	563	563	563.0
26 to 50 acres	0	1	-	-	-	2247	2247	2247.0
51 to 100 acres	1	1	3552	3552	3552.0	2473	2473	2473.0
100 + acres	0	1	-	-	-	2010	2010	2010.0

^aNumber of visitors observed during sampling periods, July and August, 1979.

On-site recreation opportunities may be determined, at least in part, by the facilities present in urban parks. These, of course, vary widely among the parks, especially since cities make at least some attempt to avoid duplication. Thus, in a city with, say, 50 parks, only three or four may offer swimming. In Fitchburg, two parks out of 29 had field hockey rinks; in Holyoke, one park offered shuffleboard. These are, of course, legitimate physical attributes of the parks that influence behavior, use levels, satisfactions, etc. The problem is that there are so many of them, and they are so varied that it becomes difficult to incorporate them directly into a statistical analysis that permits meaningful comparisons across parks.

To make such cross-park interpretations, we may need to develop indices to indicate the degree to which a park is developed for active, organized recreation (cf. Mitchell and Lovingood 1983). Such indices could prove useful in evaluating this type of development as a management option.

In addition to activity resources, urban parks also vary in the amenities they provide. Amenities can be divided into two types: natural amenities including trees and shrubs, flowers, landscaping, or other natural features, and man-made amenities like park benches, restrooms, drinking fountains, statuary, walkways, etc. Obviously these are not mutually exclusive subcategories. In fact, the list seems a rather odd assortment of things to categorize together at all. What they do have in common, however, is that they all contribute in some way to making the park a nicer place to spend time. As with the activity features, I believe it may be desirable to incorporate these amenity resources into an index to indicate the extent to which a park has been developed in this respect.

Aesthetics is a final attribute upon which urban parks vary widely. While beauty is, of course, in the eye of the beholder, there still may be widely held, normative conceptions that make it possible to systematically quantify and manage aesthetics. As a variable, it incorporates factors such as park layout and design, landscape elements, and may include some of the elements discussed above as amenities.

In general, aesthetics is widely thought to influence park use. Certainly parks differ in appearance and accounting for this variation may be important in statistical studies of user perceptions and satisfactions. There are, however, regrettably few such studies and the relationships between aesthetics and use may turn out to be complex. This appears to be a fruitful area for future research.

VARIABILITY IN USER POPULATIONS

To interpret use data from urban parks also requires an understanding of the variability of user populations. Generally, research on recreation behavior has sought to understand the user in hopes of facilitating the delivery of recreation services. As noted above, however, urban parks can serve different user populations at different times of the day, on different days of the week, and in different seasons of the year. Studies that hope to make adequate inferences about user characteristics, attitudes, and preferences must make at least some attempt to recognize this variation.

Seasonality is one major source of variation. In resource-based recreation, peak use probably occurs most often during July and August. For urban parks, the season is longer and the peaks may differ, at least in the urban Northeast. In one study, I tracked attendance throughout the year in six Northampton, MA urban parks (Figure 1). The results clearly indicate that substantial amounts of recreation use occur during other months, particularly May and June. Moreover, Figure 1 is a composite--actual use patterns varied with the kind of park. In developed athletic fields, for example, use is bi-modal, peaking in May and June during the initial formation of baseball leagues, and again in October during soccer and football seasons. In central business district parks, there is almost a step function that occurs: use is low until the fine weather begins in spring; at this point it increases and remains relatively constant throughout the summer, declining again in autumn. Clearly, studies basing their samples on only a small portion of this time need to be evaluated with care.

User populations also change throughout the day and week. In the study of central city park users mentioned above (More 1985) I found that use tended to peak at lunchtime on weekdays, but during the afternoons on weekend days. Similarly, use levels tended to be lower on Saturdays than on Sundays. User characteristics varied as well--there were distinct patterns in both the sex composition of users and the number of users in groups of different sizes. Certainly the time when a study is conducted may influence the characteristics of respondents.

THE BENEFITS OF URBAN PARKS

Thus far, I have focused almost exclusively on the use of urban parks. Indeed, concern with use levels and rates has been a dominant theme in the literature on urban parks since Gold (1972) pointed out how underutilized many neighborhood parks actually are. Increasing park use is probably the goal of most community park and recreation departments, and investment decisions on parks and park equipment are often based upon how they will contribute to this goal. Unlike the situation in resource-based facilities, crowds are often welcome. In fact, increasing the number of people in a park is often viewed as a way to inhibit problem behavior (White 1980, Hecksher 1977).

All this proceeds from the assumption that the dominant benefit supplied by urban parks is the value of the on-site recreation. Actually, urban parks provide multiple benefits, and these can be divided into two general categories: on-site benefits and off-site benefits. On-site benefits, of course, are those that accrue directly to park users from the recreation opportunities provided. Depending on the activities and participants involved, these may be subdivided into a whole array of social and psychological benefits including such things as achievement, learning, family solidarity, improved physical and mental health, and so on.

Off-site benefits--externalities--accrue to people not actually in the park. These benefits can include existence and option values, visual diversity and aesthetics provided by the park, preservation of open space and wildlife habitat, noise and pollution reduction, and even memorial, landmark, and traffic control functions. In general, the types of external benefits have not been well defined. Their value, however, is thought to be captured in the market value of surrounding properties and thus can be determined by comparing the sales prices of houses located at varying distances from the park. Unfortunately, results from these studies suggest that on-site benefits and off-site benefits may not be compatible. For example, Weicher and Zerbst (1973) reported that properties facing open-space-type parks sold for \$1,130 more than other comparable houses, while those facing parks with intensively used recreation facilities sold for \$1,150 less. Similarly, More et al. (1982) found that property value benefits declined with increasing recreation use. Obviously, people who buy homes value the privacy provided by low-use open space as opposed to the noise and congestion of high-use parks. Thus, in making decisions about their parks, cities need to consider more than simple use statistics; it is the mix of benefits in relation to neighborhood and community needs that must be considered. Researchers must devote more time to identifying and measuring the values of both on-site and off-site benefits.

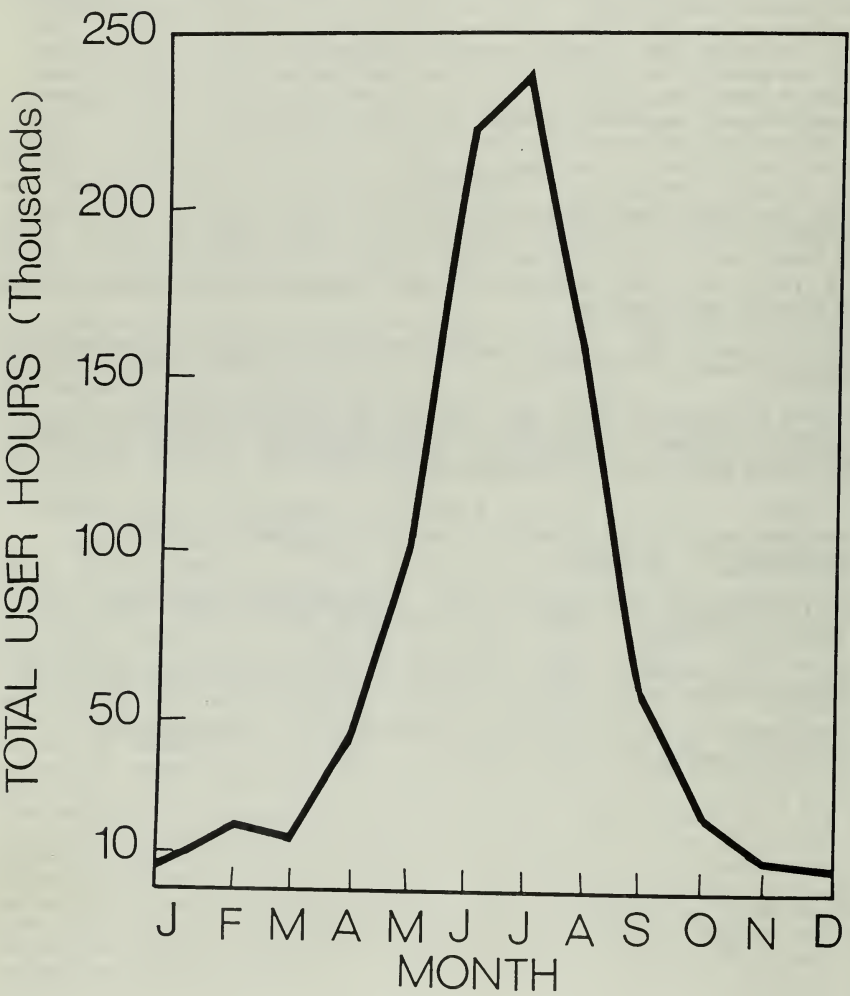
CONCLUSION

Use data provides a valuable starting point from which to evaluate urban parks and park programs. Those working with such data must, however, bear in mind the variability that exists in the parks themselves, in the users they serve, and in the benefits they provide. To effectively build a body of knowledge about urban parks, we may need to develop indices that permit comparisons of use and users across parks. Moreover, we need much more information about the qualitative aspects of use. Who uses the parks and for what purpose? Who does not use them? What benefits are being provided and whom do they benefit? What is the value of the different benefits? When we are able to answer these and related questions, we will be in a much better position to advise communities how to obtain the maximum benefit from their park systems.

LITERATURE CITED

- Dunn, D. 1980. Urban recreation research: An overview. *Leisure Sciences* 3(1): 25-58.
- Gold, S. 1972. Non-use of neighborhood parks. *Journal of the American Institute of Planners* 38(5):369-378.
- Hecksher, A. 1977. Open spaces: The life of American cities. New York: Harper and Row.
- Mitchell, L., and Lovingood, P. 1983. Predicting recreation attendance. In Abstracts from the 1983 Symposium on Leisure Research. National Park and Recreation Association, Alexandria, Va. p. 31.
- More, T. 1985. Central city parks: A behavioral perspective. Social Science Monograph No. 1, School of Natural Resources, University of Vermont, Burlington, Vt. In press.
- More, T., Stevens, T., and Allen, P. 1982. The economics of urban parks: A benefit/cost analysis. *Parks and Recreation* 17(8):31-33.
- Weicher, J., and Zerbst, R. 1973. The externalities of neighborhood parks: An empirical investigation. *Land Economics* 49:99-105.
- Whyte, W. 1980. The social life of small urban spaces. The Conservation Foundation, Washington, D.C. 125 p.

Figure 1.--The use of six Northampton, Ma. parks by month



OUTDOOR RECREATION ACTIVITY TRENDS--
INSIGHTS FROM THE 1982-83 NATIONWIDE RECREATION SURVEY

Merle J. Van Horne, Laura B. Szwak and Sharon A. Randall

Abstract.--The 1982-83 Nationwide Recreation Survey was a household interview survey of a representative sample of United States residents 12 years old and older. The survey provided, among other recreation-related data, information on the current status, past changes and expected trends in participation in 36 outdoor recreation activities. This information is summarized here along with certain related data on changes in the allocation of personal time and money to outdoor recreation and on the recreational roles of the aging.

INTRODUCTION

An understanding of the outdoor recreation participation patterns and preferences of the American people is necessary for effective policy development, planning and decisionmaking at all levels of government and in the private sector. To enhance this understanding--of activity trends among other aspects of the outdoor recreation phenomenon--the Federal Government periodically conducts nationwide recreation surveys. Selected results of the most recent survey, conducted between September 1982 and June 1983, are presented here.

At least 22 nationwide questionnaire surveys of outdoor recreation have been conducted between 1959 and 1978, and several more have occurred since then (Bevins and Wilcox 1980). Five of these surveys--one conducted by the Outdoor Recreation Resources Review Commission (ORRRC) and the rest by the Department of the Interior--may be regarded as direct antecedents of the present effort.¹ Differences of content, wording and methodology make it difficult--and somewhat hazardous--to compare the results of the present survey to its antecedents of 1970, 1972 or 1977. Comparisons will be made, where possible, to the 1960 and 1965 National Recreation Surveys, which were used as a pattern for certain basic elements of the 1982-83 survey. These three surveys share the following characteristics:

1. Personal interviews were conducted in the home where possible--with telephone followups where the selected respondent was otherwise unavailable.
2. The eligible population was the United States non-institutionalized population 12 years of age and older.

¹The first four of these surveys, conducted in 1960 (by ORRRC), 1965, 1970 and 1972, each resulted in one or more final reports which have since become difficult to find, even in major libraries. Fortunately, all of them (plus a less directly relevant survey conducted in 1971) are described and evaluated in Kirchner Associates, Inc. (1979). The most recent antecedent is the 1977 Nationwide Recreation Survey, which is described in Appendix I (Survey Summary) and Appendix II (Survey Technical Reports) of The third nationwide outdoor recreation plan (US Heritage Conservation and Recreation Service 1979).

3. The survey was conducted by the Bureau of the Census in accordance with its exacting standards and procedures.

The 1982-83 Nationwide Recreation Survey (NRS) was sponsored by the National Park Service in cooperation with the Forest Service, the Bureau of Land Management and the Administration on Aging. The Bureau of the Census conducted the interviews as a supplement to the monthly National Crime Survey. This approach resulted in substantially lower cost and respondent burden than would have been possible with an independent survey of comparable size. About 1400 interviews were conducted in each of four months--September 1982, and January, April and June 1983, for a total sample of 5757 completed interviews. The methodology and procedures used, and the estimated sampling errors, are summarized in the final report of the NRS (Van Horne, Szwak and Randall 1984) and described in detail in the methodological report (Robinson and Kahn 1984). The sample was designed, and the data were weighted, to represent the non-institutionalized United States population 12 years of age and older.

Of the numerous items of recreation-related information available in the NRS data base, only those related to activity trends will be summarized here--namely participation rates, numbers and kinds of participants, activities particularly enjoyed by respondents, 20 year trends for certain activities, recent and prospective changes in respondents' allocations of time and money to outdoor recreation, and selected information about recreation and aging. More detailed analyses of these results, as well as information about trips taken by respondents, environments utilized, constraints on participation, expenditure patterns and reasons for changes in recreation behavior are presented in the NRS final report. Of special interest to park and recreation professionals is the chapter about national parks. The respondent's park visitation history is analyzed in conjunction with his or her opinions on fees and other policy issues.

OUTDOOR RECREATION ACTIVITIES-- THE CURRENT STATUS

As in previous nationwide recreation surveys, each respondent was given a list of outdoor recreation activities and asked to identify the ones in which he or she had engaged one or more times during the previous 12 months. Participation during the three months immediately prior to the survey was also ascertained. Before examining the list, the respondent was asked to name any outdoor activities (up to a limit of 3) which he or she "particularly enjoyed." Those who named one or more such activities were invited to select, from further listings, any applicable reasons for liking those activities and/or constraints upon their favored pursuits

Table 1 lists, for each of the 36 activities included in the survey, three items of information derived from the responses. The first column of figures is the population participation rate--the percentage of the survey respondents who said they participated in the activity once or more during the previous 12 months. Judgment should be used in interpreting these figures. Someone who went on a major backpacking trip once a year might well consider himself a backpacker, but one who jogged once a year would hardly be considered a jogger.

Table 1. Current status of outdoor recreation activities: 12-month participation rates, choice by participants as "particularly enjoyed," and implicit number of participants.

Activity	Percentage of total sample who said they participated once or more during 12 months prior to interview	Percentage of participants who said they particularly enjoyed the activity ^a	Implicit number of participants in the U.S. population 12 years old or older (millions)
Bicycling	32	30	61
Horseback riding	9	40	17
Golfing	13	46	24
Tennis outdoors	17	45	32
Outdoor team sports	24	72	45
Other outdoor games or sports	13	b	24
Boating	28	16	53
Canoeing or kayaking	8	16	15
Sailing	6	19	11
Motorboating	19	b	35
Other boating or watercraft sport	6	b	11
Waterskiing	9	32	17
Swimming outdoors	53	18	99
Swimming in an outdoor pool	43	b	80
Other outdoor swimming	32	b	59
Fishing	34	58	64
Hunting	12	75	22
Camping	24	51	46
Backpacking	5	15	9
Camping in developed campgrounds	17	b	33
Camping in primitive campgrounds	10	b	18
Other camping	4	b	8
Day hiking	14	37	26
Walking for pleasure	53	17	100
Running or jogging	26	19	49
Birdwatching or other nature study activities	12	7	22
Picnics	48	8	90
Driving for pleasure	48	1 ^c	90
Sightseeing	46	2 ^c	86
Off-road vehicle driving (includes motorcycles but not snowmobiles)	11	9	20
Ice skating	6	10	12
Snow skiing	9	49	16
Downhill skiing	6	b	12
Cross-country skiing or ski touring	3	b	6
Snowmobiling	3	12	6
Sledding	10	1	8
Other outdoor winter activities	4	b	20
Visiting zoos, fairs, or amusement parks	50	1 ^c	95
Attending outdoor sports events	40	2 ^c	75
Attending outdoor concerts, plays, or other outdoor performances	25	1 ^c	48
Other activities (not on list)	4	--	--
No participation	11	--	21 ^d

^a Respondents were asked to name up to 3 activities that they "particularly enjoyed doing."

^b Ten activities--largely aggregates or subsets for analytical purposes--were not selected as "particularly enjoyed." Respondents were asked to name their favorites before the activity list was introduced.

^c May not have been perceived as outdoor recreation activities by some respondents.

^d Non-participants.

The second column contains the percentages of the participants in each activity who said, before the introduction of the activity list, that this was a pursuit they "particularly enjoyed." In certain instances, the second percentage (particularly enjoyed) exceeds the first (participated once or more). This is due to the change in percentage bases between the two columns. For horseback riding, for instance, 9 percent of the total sample (of 5757 respondents) said they rode once or more during the previous 12 months. Forty percent of these horseback riders (40 percent of the 9 percent) said they particularly enjoyed the activity.¹ Choice as a "favorite" is an indicator of depth or intensity of involvement in an activity.

The final figure for each activity is the "implicit number of participants" in the United States population (in millions). These estimates are of intense interest to many data users, particularly those in the private sector. But they are hazardous numbers and should be used with the greatest care. Their derivation is deceptively simple: basically they are what is obtained if the population participation rate is multiplied by 188,092,000--the Census Bureau's estimate of the number of non-institutionalized persons 12 years old or older in the United States population at the time of the survey.

These "population totals" tend to create an appearance of greater accuracy than has actually been achieved.² Users of these figures should bear in mind that--

1. On top of sampling error, recall error, nonresponse error, etc., we now have the additional sources of error affecting the intercensal estimates of the numbers of persons in various segments of the United States population.

2. Even the target or "true" population totals are not the total numbers of fishermen, etc., in the United States, but rather the number 12 years old or over. The behavior of the under-12 group affects the meaning of the different activity totals in very different ways. The "implicit total" of persons who went swimming is a much more conservative indicator of the "real" total of United States residents who go swimming than is the corresponding "implicit total" for golfing.

The usefulness of activity participation rates for planning, research, policy evaluation, etc., is greatly enhanced by examining the recreation patterns of various population segments. This is done in Table 2 which gives, for each listed activity, the percentages of men,

¹Besides choosing many unlisted activities, the respondents also failed to choose 10 of the listed ones. This was no surprise, since some of the activities on the list were artificial constructs foreign to the thought processes of the recreating public. Camping interests, for instance, should not be dismayed that nobody expressed spontaneous enthusiasm for going "other camping."

²Since percentages are inherently abstractions from reality, it may be easier to keep in mind what they imply and--more importantly--do not imply. With percentages, moreover, it is easier for writers to keep reminding their readers that the figures refer in the first instance to a sample of respondents, and that they reflect the target population only insofar as the sample is representative.

Table 2. Percentage of respondents who said they participated once or more during 12 months before the interview

Activity	Total sample	Sex		Age					Education*	
		Male	Female	12-24	25-39	40-59	60+		less than high school	high school 4 or more years of college
Percentage of total sample included in each category	100	48	52	27	29	25	19		26	55
Bicycling	32	35	32	55	37	22	7		11	28
Horseback riding	9	8	10	18	10	5	1		2	8
Golfing	13	20	7	16	13	13	7		4	12
Tennis outdoors	17	18	16	32	20	10	1		2	13
Outdoor team sports	24	30	18	50	26	11	2		7	18
Other outdoor games or sports	15	15	10	24	13	8	2		9	15
Boating	28	32	24	38	35	25	9		11	28
Canoing or kayaking	8	10	7	14	9	6	1		1	7
Sailing	6	7	5	9	7	5	2		1	4
Motorboating	19	22	16	25	23	17	7		8	19
Other boating or watercraft sport	6	7	5	8	7	4	2		2	5
Water skiing	9	11	7	17	12	4	x		2	8
Swimming outdoors	53	55	51	78	65	41	16		19	51
Swimming in an outdoor pool	45	43	42	67	49	35	11		13	40
Other outdoor swimming	32	34	30	49	40	21	7		10	30
Fishing	34	47	23	43	40	31	17		26	34
Hunting	12	22	3	15	13	13	5		10	12
Camping	24	28	22	36	30	19	6		10	24
Backpacking	5	6	5	9	5	2	x		x	7
Camping in developed campgrounds	17	18	16	24	22	15	5		7	19
Camping in primitive campgrounds	10	11	8	17	11	6	2		3	9
Other camping	4	5	3	6	5	4	1		1	5
Day hiking for pleasure	14	15	13	19	17	12	5		3	13
Day hiking for exercise or other purpose	55	48	61	57	58	55	42		32	56
Birdwatching or other nature study activities	26	30	23	51	31	13	2		6	20
Plenics	12	11	12	10	12	13	13		6	17
Driving for pleasure	48	45	51	52	59	46	29		29	51
Sightseeing	48	47	49	48	59	46	35		31	54
Off-road vehicle driving (includes light vehicles but not snowmobiles)	46	45	46	46	54	47	31		27	50
Ice skating	11	14	8	20	11	6	2		3	10
Snow skiing	9	10	7	15	6	3	x		1	4
Downhill skiing	6	8	5	12	8	3	1		1	6
Cross-country skiing or ski touring	3	4	3	5	4	3	x		x	5
Snowmobiling	3	4	2	6	3	2	x		1	3
Skiing	10	12	8	22	11	2	x		1	7
Other outdoor winter activities	4	6	3	9	4	2	x		1	4
Visiting zoos, fairs, or amusement parks	50	50	51	65	62	41	26		26	51
Attending outdoor sports events	40	44	36	55	44	36	16		15	39
Attending outdoor concerts, plays, or other outdoor performances	25	25	26	34	29	22	12		10	24
Other activities (not on list)	14	14	13	4	4	3	3		2	4
No participation	11	9	14	3	5	13	30		29	9

* Education percentages are based on respondents 22 years old or older.

x = less than one half of one percent.

Table 2 (continued). Percentage of respondents who said they participated once or more during 12 months before the interview

Activity	Total sample	Race White Black	Annual family income (dollars)					Number of persons in household					
			Under 5,000	5,000 to 14,999	15,000 to 24,999	25,000 to 49,999	50,000 and over	1	2	3	4	5 or more	
Percentage of total sample included in each category	100	89	11	10	30	27	28	5	11	29	20	20	19
Bicycling	32	33	29	23	24	35	41	45	19	24	35	44	39
Horseback riding	9	10	4	7	6	9	11	12	6	6	9	14	11
Golfing	13	14	3	6	6	13	20	27	9	13	14	17	11
Tennis outdoors	17	17	13	12	11	18	22	37	12	14	18	23	18
Outdoor team sports	24	23	27	22	19	25	29	28	14	15	26	31	34
Other outdoor games or sports	13	13	7	11	9	13	16	15	7	9	13	18	16
Boating	28	31	6	16	20	27	39	43	19	26	31	34	28
Canoing or kayaking	8	9	1	6	5	8	12	10	5	7	8	11	10
Sailing	6	7	1	4	3	5	9	14	6	7	6	6	6
Motorboating	19	21	3	10	13	18	27	32	12	17	20	24	19
Other boating or watercraft sport	6	6	1	3	4	5	7	13	4	5	7	7	5
Waterskiing	9	11	x	5	6	10	13	14	5	7	11	12	9
Swimming outdoors	53	55	32	34	39	57	68	71	31	42	59	67	60
Swimming in an outdoor pool	43	45	27	26	29	45	57	62	24	33	47	55	50
Other outdoor swimming	32	34	11	23	23	34	40	43	19	24	36	40	37
Fishing	34	35	27	24	30	38	38	35	19	30	36	42	38
Hunting	12	12	7	8	12	14	14	8	5	10	13	13	15
Camping	24	27	6	15	19	29	31	25	14	21	27	30	28
Backpacking	5	5	1	3	3	5	7	5	4	4	5	6	5
Camping in developed campgrounds	17	19	4	8	13	20	25	17	8	15	20	20	20
Camping in primitive campgrounds	10	11	2	7	7	12	13	9	6	8	10	13	10
Other camping	4	5	2	3	4	5	6	2	2	4	5	5	4
Day hiking	14	15	3	10	10	13	18	25	10	14	14	18	13
Walking for pleasure	53	54	49	45	46	54	61	62	47	52	57	56	53
Running or jogging	26	26	30	21	20	27	33	37	17	18	27	36	34
Birdwatching or other nature study activities	12	13	5	10	10	12	14	19	12	15	10	12	8
Picnics	48	49	42	36	41	53	56	58	34	41	55	57	52
Driving for pleasure	48	50	35	29	43	53	55	60	37	48	55	52	43
Sightseeing	46	47	36	27	38	48	57	67	35	46	51	52	40
Off-road vehicle driving (includes motorcycles but not snowmobiles)	11	12	3	9	8	10	15	13	6	8	13	14	13
Ice skating	6	7	1	5	5	7	10	11	7	5	6	10	7
Snow skating	9	10	1	5	3	7	13	21	7	9	8	12	7
Downhill skiing	6	7	x	4	4	5	9	18	6	7	6	9	5
Cross-country skiing or ski touring	3	4	x	2	2	3	5	8	2	3	3	5	3
Snowmobiling	3	3	x	2	2	4	4	4	1	3	4	4	4
Sledding	10	12	2	9	6	12	13	15	3	5	10	18	15
Other outdoor winter activities	4	5	1	4	3	4	6	3	3	2	5	6	5
Visiting zoos, fairs, amusement parks, or outdoor sports events	50	51	40	32	40	55	62	62	33	42	54	62	57
Attending outdoor concerts, plays, or other outdoor performances	40	41	33	24	30	43	51	61	23	33	43	49	47
Other outdoor performances	25	26	21	17	21	24	32	38	23	24	28	27	24
Other activities (not on list)	4	4	1	4	3	4	4	9	4	5	4	4	4
No participation	11	10	18	28	18	7	4	3	25	15	7	6	7

x = less than one half of one percent.

women, whites, blacks, etc., who said they participated once or more during the prior 12 months. Further breakdowns are presented in the final report. The intent here is to present an approximate outdoor recreation activity profile of each population segment. The figures in Table 2 address such questions as: "Of all American college graduates, what percentage swim, run, sightsee, etc.?" Readers should bear in mind that these are not demographic profiles of various activity clienteles. They do not address questions like: "Of all American joggers, how many are young, poor, female, etc.?" For activities in which 500 or more respondents participated, demographic profiles are included in the final report.

Two further elements of information about individual activities are included in Table 3--seasonality and volume of participation per participant. The seasonal patterns--available in a nationwide recreation survey for the first time since 1960--offer few surprises. Basically they confirm what experienced recreation professionals know by observation--that most outdoor activities are so highly seasonal as to limit the harvest of recreation benefits per unit of resource capacity. The average number of activity-days per participant per month are principally valuable for purposes of comparison. Even here, caution should be exercised. A "day" of participation was counted for each calendar day on which the respondent did the activity--whether for 10 minutes or 24 hours. Moreover the days for different activities are not additive but overlapping. A respondent could generate many activity-days on a given calendar day--one for each activity he or she engaged in on that day.

OUTDOOR RECREATION ACTIVITIES-- CHANGES SINCE 1960 AND 1965

How have the outdoor recreation habits of Americans changed since the first National Recreation Survey--the Outdoor Recreation Resources Review Commission (ORRRC) survey of 1960? The 1982-83 NRS was designed to answer that question and, in addition, to afford comparisons with the second NRS conducted by the Bureau of Outdoor Recreation (BOR) in 1965. This quest for comparability was only partially successful. The two earlier surveys obtained seasonal participation rates but no 12-month rates.¹ The present survey was designed to obtain both, but Census restrictions on interview length resulted in the deletion of seasonal questions for 14 of the 36 listed activities. For certain of the remaining activities, moreover, research objectives of the sponsoring agencies necessitated language changes which, in turn, obviated the possibility of comparison with the older surveys. This leaves 10 activities which can be compared on the basis of seasonal (mainly summer) participation rates without major manipulations of the data. These comparisons are made in Table 4. Certain more tentative trend inferences are made on the basis of comparisons between the 1960 seasonal rates and the current survey's 12-month rates. These will be found in the treatments of individual activities.

¹The 1960 NRS was a four-season survey like the 1982-83 effort. The 1965 interviews were limited to September; hence the participation data were for the summer only with the exceptions of hunting, skiing, sledding and ice skating (fall, winter and spring data).

Table 3. Monthly volume of activity by season

Activity	Average number of days of participation per participant per month during season prior to interview ^{a b}			
	Spring	Summer	Fall	Winter
Bicycling	3.4	4.2	2.5	2.0
Horseback riding	1.3	2.2	1.3	0.4
Golfing	1.5	2.1	0.8	0.6
Tennis outdoors	1.5	1.4	0.8	0.8
Outdoor team sports	3.7	3.5	2.2	2.3
Canoeing or kayaking	0.1	0.5	0.1	0.1
Sailing	0.5	0.9	0.3	0.1
Motorboating	0.5	1.4	0.3	0.2
Swimming in an outdoor pool	1.6	3.6	0.6	0.3
Other outdoor swimming	0.8	2.4	0.2	0.5
Fishing	1.5	1.3	0.5	0.5
Hunting	0.4	0.4	1.6	1.0
Backpacking	0.5	0.9	0.3	0.1
Camping in developed campgrounds	0.4	1.1	0.3	0.3
Camping in primitive campgrounds	0.4	1.0	0.2	0.2
Other camping	0.3	0.6	0.2	0.2
Day hiking	1.0	1.3	0.8	0.7
Birdwatching or other nature study activities	8.1	6.2	5.5	5.0
Off-road vehicle driving (includes motorcycles but not snowmobiles)	1.8	2.3	1.1	1.3
Downhill skiing	0.1	0.1	0.1	1.1
Cross-country skiing or ski touring	0.0	x	0.1	0.8
Snowmobiling	0.0	0.2	x	1.1

^a A "day" of participation was counted for each calendar day on which the respondent said he or she did the activity, even for a very short period.

^b Not ascertained for certain activities due to limitations on interview length.

x = less than one twentieth of a day.

Table 4. Percentages of respondents who said they participated once or more in selected activities during the 3 months before the interview—June, July, and August 1960, 1965, and 1982^{a b}

Activity	Summer 1960	Summer 1965	Summer 1982
Bicycling	9	16	28
Horseback riding	6	8	7
Fishing	29	30	30
Canoeing or kayaking	2	3	8
Sailing	2	3	4
Swimming	45	48	51
Camping	8	10	19
Hunting	13 ^a	13 ^a	10 ^a
Skiing	2 ^b	4 ^b	9 ^b

^a Hunting during fall season.

^b Skiing during winter.

OUTDOOR RECREATION ACTIVITIES-- THE SHORT-TERM TRENDS

To permit the estimation of short run trends, respondents were asked to name any outdoor recreation activities they had stopped doing in the 2 years prior to the interview, and any they anticipated starting in the next 2 years. These items were used, along with the age at which the respondent first did the activity, to generate the 3 indices of short run change presented in Table 5. Although the interviewer asked for anticipated new activities which the respondent had "never done before," many persons cited activities which they said they had stopped earlier. Since such instances bear little relation to trends, they were dropped from the data--for both stopping and expecting to start--before the percentages were derived. Since future expectations are speculative by comparison with past behavior, the dropping and uptake percentages should not be used to derive an indicator of net change.

Activities recently started by each respondent were identified by subtracting his age when he first did the activity from his age at the time of the interview. If the difference was 2 or less, the person was counted as having started the activity in the prior 2 years.

All 3 of these short term trend indicators are useful for comparisons among activities. Even here, however, caution is warranted. Many of the activities on the list are typically begun in early childhood. Hence, with a sample restricted to persons 12 years of age or older, the NRS data may not adequately reveal the rate of recruitment of new participants. Similarly, death is an unmeasured cause of participant loss.

THE ACTIVITIES EXAMINED

The 36 listed activities--plus four aggregates created during the analysis (boating, outdoor swimming, camping and snow skiing)--will be examined in order of their appearance in Table 1. For the listed pursuits, this is also the order in which they appear on the questionnaire. For the sake of comparability, the order established in the 1960 and 1965 National Recreation Surveys was retained where practicable.

Bicycling

Bicycling has gained dramatically in the past 22 years on every available yardstick, more than tripling its population participation rate (Table 4). Especially noteworthy is the increase in adult bicycling, which was practically insignificant in 1960. In the present survey, cycling is part of the free time repertoire of 37 percent of the young adults (age 25-39) and 22 percent of the middle-aged (40-59 years). This greatly exceeds the most sanguine predictions of the early 1960s. On the "depth" yardstick of percentage of participants who cited the activity as "particularly enjoyed," bicycling, with 30 percent, topped all the "casual" activities--those which can be enjoyed on the spur of the moment with little cost or preparation.

Table 5. Short-term trend indicators

Activity	Percentage of total sample who said they participated at least once in prior 12 months	Respondents who said they started or stopped participating during the past 2 years prior to interview or who said they expect to start participating in the next 2 years (as a percentage of current participants—first column)		
		Percentage who started activity in prior two years ^a	Percentage who said they stopped activity in prior 2 years ^b	Percentage who said they expect to start activity in next 2 years
Bicycling	32	5	5	3
Horseback riding	9	9	7	15
Golfing	13	21	8	15
Tennis outdoors	17	17	7	20
Boating	28	—	4	16
Canoeing or kayaking	8	27	3	16
Sailing	6	29	3	16
Waterskiing	9	—	8	26
Swimming outdoors	53	—	x	x
Fishing	34	6	5	5
Hunting	12	12	13	7
Camping	24	—	2	5
Backpacking	5	17	5	14
Day hiking	14	10	3	9
Walking for pleasure	53	—	1	1
Running or jogging	26	—	5	6
Birdwatching or other nature study activities	12	13	x	2
Picnics	48	—	1	x
Driving for pleasure	48	—	x	1
Sightseeing	46	—	1	1
Off-road vehicle driving (includes motorcycles but not snowmobiles)	11	24	3	2
Ice skating	6	—	6	10
Snow skiing	9	—	5	24
Cross-country skiing or ski touring	3	42	3	33
Snowmobiling	3	24	7	19

^a Based on the difference between age on starting the activity and current age. Not ascertained for certain activities (—).
^b Persons who said they stopped during the prior 2 years and expect to start in the next 2 years were not included in these percentages.

x = less than one half of one percent.

Horseback Riding

More stable in its participation rate since the 1960s, horseback riding is typical of those activities which require substantial investments of time and/or money to participate. It counts only 9 percent of the NRS respondents as participants but, of those who went horseback riding once or more in the prior 12 months, 40 percent cited the activity as "particularly enjoyed." This is a very respectable showing as will be seen from Table 1. The demographic patterning of horseback riders is rather typical of outdoor activities and does not support the elite stereotype often associated with the sport. Also, by contrast to most forms of outdoor recreation, more women than men reported riding horseback.

Golfing

Men participate in golf at almost triple the rate of women. It is, however, one of the least age-related activities. Participation, once begun, holds up well through middle age and into the older years. The participation rates corroborate the popular impression of an upscale sport. Those in the least advantaged categories of education, race and income participate at less than half the general population rate (13 percent) and at only one fourth to one sixth the rate of the most advantaged categories.

Tennis Outdoors

Tennis is often cited as a 1970s boom sport. Though we have no 1960 data, a comparison of the 1965 and 1982 summer rates indicates that this activity has about tripled in the proportion of Americans who participate. It is somewhat less upscale than golf in its relation to income, and blacks participate at almost as high a rate as whites.

Outdoor Team Sports

Participation in outdoor team sports is still mostly a pursuit of young males, though women and mature adults maintain a respectable presence among the players. Team participation is almost totally unrelated to race or income. A slightly higher percentage of blacks than whites said they engaged in an outdoor team sport during the 12 months prior to the interview.

Boating

The general population participation rate of 28 percent for boating is impressive, given the investments of time and money involved. The demographic patterns of boaters are somewhat upscale, and participation by blacks is especially low. Sex is not an important factor, and boating participation holds up well through middle age. Virtually these same relationships are characteristic of the four component activities--canoeing or kayaking, sailing, motorboating, and "other boating or watercraft sport"--from which the "boating" data were synthesized.

Canoeing or kayaking, however, had the largest growth with a quadrupling of the summer participation rate since 1960 (from 2 to 8 percent).¹

Waterskiing

Self-identified waterskiers were counted in both the "boating" and the "swimming" figures. This had little effect on those larger aggregates, since most waterskiers identified themselves as both boaters and swimmers in any case. The demographic pattern of waterskiers resembles boaters rather than swimmers, however, and the sport is overwhelmingly a pursuit of youth and young adulthood.

Swimming Outdoors

Outdoor swimming was already extremely popular in the 1960 survey with relatively little room for growth. There was a rise in the summer participation rate from 45 to 51 percent over the 22 year period. In the present survey, a somewhat larger proportion of the respondents said they swam in outdoor pools than in other environments (lakes, rivers, ocean beaches, etc.). Both forms of the sport have a widespread following among all demographic segments and even hold up fairly well with advancing age.

Fishing

Even more than swimming, fishing has been stable since 1960, as inferred from the summer participation rates (29 percent in 1960 compared with 30 percent in 1982). More than twice as many men fished as women, but otherwise the sport was well distributed across the various demographic categories. Participation is virtually unrelated to income or education and holds up well with age. Fishing enthusiasts (58 percent of participants!) most frequently cite peace and quiet, getting away from day-to-day living, and enjoying nature and the outdoors as reasons for their preference.

Hunting

The demographic pattern of hunters among our survey respondents is unique--totally unlike that of any other activity's participants. The sport is almost entirely male. Of the participants, 88 percent were men and boys. It is also the most predominantly rural pursuit listed in our survey with non-SMSA residents four times more likely to be hunters than central city people--and twice as likely as suburbanites.² Like fishermen, the proportion of Americans who hunt appears to have been stable since 1960. Apart from the predominance of rural males, hunters are very well distributed across the demographic spectrum. Though only

¹In the 1960 survey, the activity was referred to as "canoeing." Theoretically, the absence of kayaking in the earlier version could inflate the appearance of growth. The distortion is probably minimal since kayaking was considered insignificant in the United States at that time.

²Respondents who lived in an SMSA (Standard Metropolitan Statistical Area) but not in a central city were presumed suburban.

12 percent of the NRS respondents hunted, the sport tops the list for enthusiasm on the part of those who did. Seventy-five percent of the self-identified hunters said they particularly enjoyed the sport, and 28 percent cited it as their absolute favorite outdoor pursuit.

Camping

Respondents who said they went backpacking, or camped in developed or primitive campgrounds, or engaged in any other camping activity during the prior 12 months were counted as camping participants. This is not exactly the same as the aggregate "camping" choice offered in 1960 and 1965, but it should be quite close. It appears (Table 3) that camping as a whole has about doubled its population participation rate in the past 22 years. The self-identified campers--24 percent of the survey's respondents--are well (or at least typically) distributed across the various demographic segments of the sample. Camping enjoys a dedicated following, as evidenced by the 51 percent of participants who cited it as "particularly enjoyed" and the 18 percent who chose it as the one activity they "most enjoyed."

Backpacking

This is the first nationwide recreation survey to include backpacking--a combination of primitive camping with hiking. Backpacking, though it attracted only 5 percent of our respondents as participants, has become a major concern of land managing agencies. It is the principal means of access to many remote wilderness areas--environments we are just now learning how to manage. Backpacking attracts few blacks and drops off sharply with age. It attracts disproportionate numbers of the well-educated. Otherwise, this pursuit is widely distributed across the income spectrum and other demographic categories.

Day Hiking

Hiking is another pursuit which shows substantial growth since 1960--to a current participation rate of 14 percent. With the exception of blacks, only 3 percent of whom said they hiked, participation was very widely distributed across the demographic spectra of the respondent sample. Thirty-seven percent of the participants cited hiking as "particularly enjoyed."

Walking for Pleasure

Roughly equivalent to "taking walks," walking for pleasure was defined, by virtue of being asked after hiking, as the "casual" residue of recreational walking. Pleasure walking, with 53 percent of the sample participating, was tied with swimming as the most widespread activity in the 1982-83 Nationwide Recreation Survey. The popularity of walking extends across all categories of the respondent sample, with no less than 35 percent participating even in the most disadvantaged groupings. With 42 percent, participation by the older respondents (age 60 or more) greatly exceeded their involvement with any other activity in the survey.

Running or Jogging

As evidenced by this and other surveys, the penetration of running and jogging into the recreational repertoire of the American people can only be described as extraordinary. In 1960, running was limited to a relatively few young athletes. It was considered so insignificant as not to warrant inclusion in the 1960 National Recreational Survey (which included rock climbing!) In the present survey, more than 1 in 4 respondents (26 percent) claimed to have run or jogged in the prior 12 months, and 19 percent of the runners cited the activity as "particularly enjoyed." The proportion of runners among our respondents increases strongly with education and declines sharply with age. (Still, 13 percent of the age 40-59 category is respectable for an activity which is regarded as one of the most stressful sports in its demands on the cardiovascular system.) Otherwise, participation in running was well distributed across the demographic categories of respondents, with blacks participating at a higher rate than whites.

Birdwatching or Other Nature Study Activities

Nature study, judged by its rather even distribution across the demographic categories, is one of the most available of outdoor activities. It is the only activity on our list which actually increases in participation--if gradually--across the entire age spectrum. Given this apparent availability, the population participation rate of 12 percent is unimpressive, as is the 7 percent of participants who cited this activity as "particularly enjoyed." Comparison with other surveys indicates, however, that this is too bleak a picture. "Birdwatching or other nature study activities" was included in the survey to capture, as far as possible in a single label, the wide spectrum of pursuits involving the "appreciative" or "nonconsumptive" enjoyment of nature. A comparison with the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation suggests that our label captured only a fraction of this type of behavior (U.S. Fish and Wildlife Service and U.S. Bureau of the Census 1982). That survey, with a similar but larger sample of a reasonably comparable target population (U.S. residents 16 years old or older), used a much more detailed series of questions to capture a definitionally narrower spectrum of pursuits than our "birdwatching or other nature study activities." The 1980 Fishing, Hunting etc. Survey, obtained population participation rates of 49 percent for primary nonconsumptive wildlife-related activities.

Picnics

Many people (48 percent of the NRS sample) of all ages and conditions go on picnics, but few cite picnicking as a favorite activity. With a 51 percent participation rate, slightly more women said they picnicked than men (with 45 percent).

Driving for Pleasure

With summer participation rates of 53 and 52 percent, picnicking and driving for pleasure topped the list of activities in the 1960 National Recreation Survey. In 1965 they maintained their rank and increased their summer participation rates to 57 percent for picnicking and 55

percent for pleasure driving. They have not kept pace in the interim. Due to Census restrictions on interview length, the summer participation rates were not obtained for these activities in the current survey. However, the 12 month rate for both activities was 48 percent, and the summer rates could only be the same or (likely) lower. The availability of pleasure driving across all population segments continues to be impressive, however. With 35 percent participating, pleasure driving was the second most widespread activity among the age-60-plus group in the current survey. Only walking for pleasure, with 42 percent, was cited by a larger number of senior citizens.

Sightseeing

Sightseeing has also fallen off a bit since the 1960s (judged by the criteria stated above (1982-83 twelve-month participation rate compared with the 1960 and 1965 summer rates). Nevertheless, with 46 percent of the sample saying they went sightseeing in the prior 12 months, it is clear that this activity is still very much a part of the nation's leisure patterns. There is a marked tendency of sightseeing participation to increase with more years of schooling. Otherwise, the activity is done widely by all population groups represented in the sample.

Off-Road Vehicle Driving (Includes Motorcycles but not Snowmobiles)

In addition to motorcycling, this aggregate of off-road motorized travel includes driving four wheel drives, all-terrain vehicles, and beach buggies. It was not much of a factor in the 1960s and was not included in the earlier surveys. Almost the entire 11 percent participation rate can be considered to represent growth since that time. Driving off-road is well distributed across the various categories of respondents. Only blacks, with 3 percent, are conspicuously underrepresented. For an activity with all the trappings of a public passion (clubs, periodicals, expensive equipment), driving off-road is rather low (9 percent) on the percentage of participants who cited the sport as "particularly enjoyed".

Ice Skating

By comparison with the 1960s, ice skating, too, has declined slightly in the percentage of survey respondents participating. Even the 6 percent who did go ice skating tended not to cite the activity as especially enjoyed. This sport is overwhelmingly a pursuit of well-educated, northern, white young people.

Snow Skiing

The winter slack left by stagnating participation in ice skating is more than made up by the surge in snow skiing. The 1960 winter participation rate of 2 percent left plenty of room for growth, but a quadrupling of that rate over a 22 year interval is still impressive. Skiing must be regarded as an upscale sport by any available yardstick, and it declines sharply with age. These conclusions can be drawn for snow skiing in general as well as for downhill skiing, which continues to attract the majority of snow skiing participants. Almost half

(49 percent) of the self-identified skiers in our sample said they "particularly enjoyed" the sport.

Cross Country Skiing or Ski Touring

Though cross country was the form of skiing originally brought to North America by immigrants from northern Europe, it had declined to insignificance by the 1960s and was omitted, as a separate category, from the 1960 and 1965 surveys. Its resurgence to a population participation rate of 3 percent in 1982-83 has occurred, therefore, from virtually a zero base. The demographic pattern of participation is similar to that for downhill, except that it is markedly less popular with the city people in the sample and holds up somewhat better into middle age.

Snowmobiling

The recreational use of motorized oversnow vehicles was just getting started in the United States in the 1960s, hence snowmobiling was not included in the 1960 and 1965 surveys. The three percent of our respondents who said they went snowmobiling can be regarded as representing growth since 1960. The demographic patterning of our self-identified snowmobilers is similar to that of the cross country skiers--except that snowmobiling is not upscale on the education and income yardsticks.

Sledding

Judged by the winter participation rates of 9 percent, sledding (which includes tobogganing, tubing-on-snow, etc.) has been flat over the past 22 years with respect to the proportion of Americans who engage in it. The participation rate declines sharply with age, and the predominance of young people among sledders would doubtless be even greater if data were available for the under-12 population.

Visiting Zoos, Fairs or Amusement Parks

With a population participation rate of 50 percent, this first of the "visiting and attending" activities ranked just below swimming and walking for third place on this measure of broad appeal. This kind of visitation appears to be almost universally available to our respondents of all ages and conditions. Some of the 26 percent participation by the age-60-plus group is likely a part of the grandparenting process.

Attending Outdoor Sports Events

Outdoor spectator sports attendance is also widespread among all groupings of the Nationwide Recreation Survey respondents, with a population participation rate of 40 percent. A summer comparison reveals an approximate doubling of the seasonal rate since 1960. Women are well represented among sports attendees--a contrast to the traditional male stereotype of the American sports fan.

Attending Outdoor Concerts, Plays, or Other Outdoor Performances

The final "visiting and attending" activity--and the last listed activity in the survey--includes attendance at a wide variety of

performances, historic pageants, and miscellaneous events. The summer participation rate for this activity more than doubled between the 1960 and the 1982-83 surveys. Attendance at outdoor performances rises markedly with increased educational attainment. Otherwise, this is one of the more widespread, and apparently more accessible, forms of outdoor recreation in our survey.

No Participation

This is the first nationwide recreation survey which includes detailed summary data for the segment of the respondent sample who said they did nothing at all for recreation in the outdoors during the prior 12 months. Of the total sample, 11 percent were in this category --virtually unchanged from the 1960 figure of 10 percent. The preponderance of these people were in the older age groups, did not finish high school, were low on the income scale and lived in one- or two-person households. Almost twice the proportion of blacks were nonparticipants as compared to whites.

SHORT TERM TRENDS IN TIME AND MONEY EXPENDITURES

In the 1982-83 Nationwide Recreation Survey, respondents aged 16 and over were asked if the amounts of time and money they spent for outdoor recreation had changed in the past two years and if they expected changes in the next 2 years.¹ If they indicated a change in expenditures, the respondents were asked the reason(s) for the change.

Changes in Time Expenditures

The first question asked if the respondent was spending more, less or about the same amount of time on outdoor recreation in the present (1982 or 1983) compared to 2 years ago (1980 or 1981). The second question asked if the respondent expected to spend more, less or the same amount of time on outdoor recreation 2 years in the future (1984 or 1985). Figure 1 shows that 18 percent of these respondents said they were spending more time presently compared to 2 years ago, but 33 percent were spending less time. About the same percentage of people who said they remained the same for the past 2 years expected to stay that way for the next 2 years. People were optimistic about spending more time in the future. Thirty-five percent (35%) intended to spend more time engaging in outdoor recreation in the next 2 years and only 9 percent intended to spend less.

Changes in the amount of free time available--largely due to changing commitments to work, school or family--were most frequently given as reasons for spending more time or less time on outdoor recreation. Changing interests and health status were often cited. Small children in

¹ This was the next-to-last series of questions on the NRS questionnaire-- followed only by the series on aging. At this point, the respondents were giving their answers in terms of the definition of "outdoor recreation" established in the previous questions, principally the list of 36 activities and a spectrum of locales ranging from back yards to national parks.

Figure 1. Recent and expected changes in time spent on outdoor recreation: Percentages of respondents aged 16 or older who cited increasing, decreasing or unchanging allocations of time.

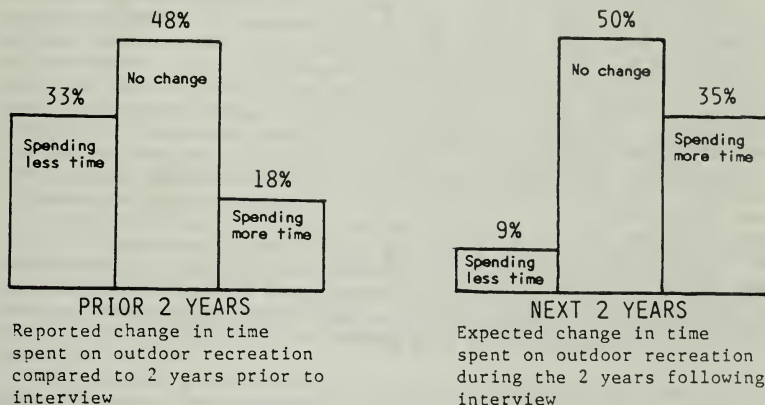
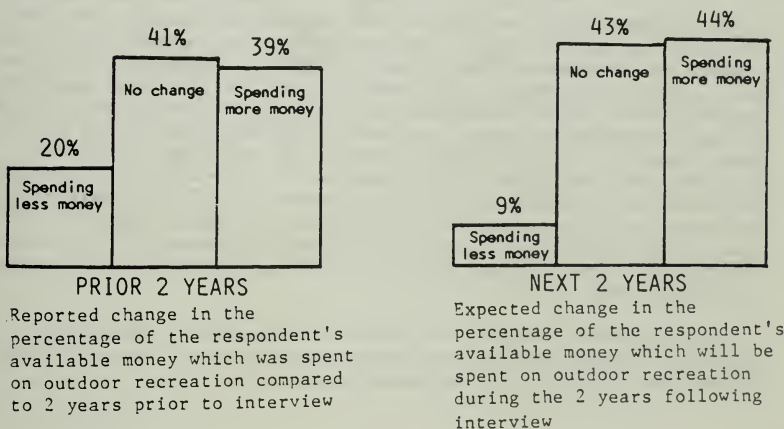


Figure 2. Recent and expected changes in the percentage of available money spent on outdoor recreation: Percentages of respondents who were both 16 years old or older and spent money on outdoor recreation in the 12 months prior to the interview, who cited increasing, decreasing or unchanging allocations of money.



the family constrained the amount of time spent on outdoor recreation, whereas the presence of older children increased it.

Changes in Money Expenditures

The survey also asked similar questions regarding the expenditure of money on outdoor recreation. Only those respondents aged 16 and older who said they had spent money for outdoor recreation in the 12 months prior to their interview--65 percent of the total sample--were asked the questions on how their expenditures had changed. Figure 2 shows a slightly different picture for money expenditure changes than for time expenditures. Of those respondents who cited changes, most said they were spending a larger percentage of their money in 1982-83 than they did 2 years before, and expected to spend even more in the next 2 years. Less than half of the respondents said their expenses had remained the same or expected them to stay the same. According to the responses, about half the past or expected changes in money expenditures were related to changes in the amounts of time or money available. The rest were mostly related to changes in interests or lifestyle--or to major equipment purchases. Those who said they were spending more time on outdoor recreation tended to cite increased money expenditures as well, but this correlation was far from perfect.

In short, most Americans appear to be experiencing little change in their allocations of time and money to outdoor pursuits. For the rest, the pattern for the two years prior to the survey could be summed up: "paying more for less recreation"--or at least for less time in the outdoors. This 1980-1983 period was, it should be noted, a time of economic stress for many Americans. The respondents' outlook for the following two years was more optimistic in regard to outdoor recreation time, even though they expected the dollar expense of their pursuits to continue to rise more rapidly than their available supply of money.

INTERGENERATIONAL TRANSFER OF OUTDOOR RECREATION SKILLS

A phenomenon with implications for long range outdoor recreation trends is the role of senior citizens in imparting outdoor skills and interests to succeeding generations. To examine the nature and extent of this kind of intergenerational transfer, the final series of questions in the 1982-83 NRS asked respondents 60 years old or older if they had any outdoor recreation skills or interests which they thought they could help others learn or practice. The 16 percent who responded yes to that question were then asked to list these skills (up to 3). Of those with teachable skills, about one fourth (4 percent of all aging respondents) indicated that they were actively teaching or coaching others, principally family (56 percent) and friends (46 percent). The principal skills taught were fishing, hunting, swimming, gardening, golf, camping and team sports.

The responses indicate that the older citizen who imparts his or her outdoor recreation skills to succeeding generations is the exception, rather than the rule, in the United States.

CONCLUSION

The 1982-83 Nationwide Recreation Survey presents a picture of a generally--but unevenly--expanding role of outdoor recreation in American life. The survey does not indicate that any of the 36 listed activities have declined in their absolute numbers of participants over the past two decades. Some appear to have lost ground in terms of the percentage of the age-12-and-over population which participate. Most have shown moderate growth, some have expanded more rapidly, and a few--notably jogging, cross country skiing, and the recreational use of snowmobiles and other off-road motorized vehicles--have emerged from virtually a zero base. All segments of the population appear to have access to at least a few outdoor recreation activities, but blacks, the aging, and those in the less advantaged categories of income and education tend to participate in a much narrower spectrum of pursuits than the population at large. This pattern has changed little since the 1960s.

The information presented here is only a fraction of that in the NRS final report. There, readers will find much greater detail on the activity-related topics treated here, as well as additional information on constraints, recreation travel, use of various environments, national parks visited, expenditure patterns, and public opinion on selected park policy issues.

For the research and planning communities, the 1982-83 NRS is a virtually untapped data mine. The NRS public use tape contains a data base of excellent quality with 714 variables recorded for each of 5757 completed interview records. Interested investigators are invited to acquire the tape and analyze this data base from their own perspectives.¹

¹Copies of the 1982-83 NRS data tape, with complete documentation, may be purchased for \$75.00 each from the Recreation Resources Assistance Division, National Park Service, USDI, Washington, D.C. 20240. Prepayment is required. Due to Census Bureau disclosure restrictions, all information on the geographic location of the respondents' places of residence has been suppressed on the public use tape.

LITERATURE CITED

- Bevins, M.I., and D.P. Wilcox. 1980. Outdoor recreation participation --analysis of national surveys, 1959-1978. Vermont Agricultural Experiment Station Bulletin 686. Burlington, VT.
- Kirchner Associates, Inc. 1979. Evaluation of five previous nationwide outdoor recreation surveys. Which is Survey Technical Report 1 in Appendix II of The third nationwide outdoor recreation plan. Heritage Conservation and Recreation Service, U.S. Department of the Interior, Washington, D.C.
- Robinson, John P., and Cindy Kahn. 1984. The 1982-83 nationwide recreation survey: A methodological report. Prepared by Survey Research Center, University of Maryland, for National Park Service, U.S. Department of the Interior, Washington, DC.
- U.S. Fish and Wildlife Service, Department of the Interior, and U.S. Bureau of the Census, Department of Commerce. 1982. 1980 national survey of fishing, hunting, and wildlife-associated recreation. U.S. Government Printing Office, Washington, DC.
- U.S. Heritage Conservation and Recreation Service, Department of the Interior. 1979. The third nationwide outdoor recreation plan, Appendix 1, Survey summary, and Appendix 2, Survey technical reports (5 volumes). U.S. Government Printing Office, Washington, DC.
- Van Horne, Merle J., Laura B. Szwak and Sharon A. Randall. 1984. The 1982-83 nationwide recreation survey: Final report. National Park Service, U.S. Department of the Interior, and Bureau of the Census, U.S. Department of Commerce, Washington, DC.

MARKET SHARE ANALYSIS OF SELECTED PUBLIC LEISURE SERVICES FROM 1979 TO 1982

Rodney B. Warnick, Ph.D., University of Massachusetts, Amherst and
Dennis R. Howard, Ph.D., University of Oregon

Abstract. The extent to which the adult demand for selected recreational activities was met by local recreation and park agencies between 1979 and 1982 was examined in this paper. The vast majority of American adults were found not to participate in "mass leisure" activities and the participation in some of these activities has actually declined. Although participation has declined for some activities, the rate of participation within an activity's use segments differed. Local public leisure service organizations appeared to hold substantial shares for selected recreational activities; however, their market shares were found to be declining from 1979 to 1982.

Additional keywords: Recreational activity, golf, tennis, racquet ball, leisure service agencies, marketing, market segmentation, participation levels, use levels.

INTRODUCTION

The concept of market share has long been recognized as a key variable in the management strategy formulation of private business firms. Most major corporations frame their long term objectives in the context of what percentage of the total potential market they can capture through the sale of their products (McCarthy and Perreault, 1984). For many of these corporations, the gain or loss of just a few percentage points in market share can have dramatic impact upon their business and profitability. Monitoring market share also forces a business manager to pay attention to what the competition is doing. While market share has increasingly been used as a strategic marketing objective by private firms, the concept has very limited exposure in the public sector, particularly in public recreation and park agencies. While public leisure service agencies operate in a fundamentally different context than private firms, with service not profit as the overriding motive, the application of the market share concept can offer benefits and reveal numerous insights. In the first place, it appears that the public recreation and park managers have never assessed the total market potential for their products and services. Recent data have shown that municipal recreation and park agencies serve a narrow and very limited range of clients (Howard and Crompton, 1984). A majority of the programs and facilities attracted less than one in five adult residents in the major metropolitan areas studied.

Such findings raise important questions. For example, to what extent is the public's total demand for recreational activities served by the local recreation and park agencies? Do such relatively small participation rates indicate a failing on the part of public managers? What is the track record in regard to market share of the public recreation and park agencies -- is their market share increasing or declining? Why?

Furthermore, what is occurring in regard to participation rates within selected recreational activities?

Howard (1985) explored each of these questions within a one year timeframe; however, this study sought to expand upon his initial findings and these same questions by examining them over time, specifically over the time period of 1979 to 1982. Four years of data from an annual survey of recreation participation were used to illustrate the changing extent to which adult Americans participate in a variety of sport and leisure activities. The study also examined the recommendation made by Howard (1985) to analyze the distribution of various user or participant segments. The market shares of leisure service agencies (e.g., the percentage of the total participation occurring at these leisure service facilities) were also calculated for selected recreational activities and tracked over the period of 1979 to 1982.

The value of this marketing analysis is to provide leisure service managers with a performance yardstick for valid comparisons. The data serve as a valuable gauge with for assessing what kind of participation in local services may be realistic, particularly over time, and for predicting future trends. It may also be helpful in determining what constitutes a reasonable market share for selected program areas. The analysis provides some insight into the market share successes and failures of each sector (both public and private) which compete for the recreation consumer. Furthermore, the analysis can serve as a basis for formulating realistic marketing objectives and strategies for recreation and park agencies. Finally and probably most important, this study provides valuable information into the trends of recreation service provision and recreation participation levels in general.

THE DATA BASE AND METHODOLOGY

Simmons Market Research Bureau, Inc. (1979, 1980, 1981, and 1982) annually measures the demographic composition of the participants of a wide variety of leisure activities ranging from archery to water skiing. Households and one adult per household were selected on a national probability sample basis. Data on leisure activity participation and market share analysis were obtained from a self-administered questionnaire distributed each year from 1979 to 1982. Demographic data were recovered during a separate personal interview with each respondent. The data used in this research report were based on samples of 15,026 adults for 1979, 15,002 adults for 1980, 15,029 adults for 1981, and 15,417 adults for 1982 and were projected to the adult population, age 18 years and over, living in the coterminus 48 states of the United States. Respondents were asked to indicate " the sports or activities each played or participated in, in the last 12 months." For the purposes of this study, the data were examined by descriptive statistics.

The data are presented in the following format. First, an examination of participation rates for a variety of recreational activities were examined for the most recent year, 1982, in which data were available. Then, three selected recreational activities -- tennis, golf, and racquet ball, were examined by participation rates, participant profiles (use segments), and market share comparisons for each of the four years from 1979 to 1982.

RESULTS

Participation Rates for Selected Recreational Activities in 1982

Howard (1985) examined participation rates in a variety of activities from the Simmons data for 1981. This study sought to continue this evaluation for the year 1982. The examination of the participation rates for a variety of recreational activities for 1982 revealed similar findings. For example, in 1982, the data again indicated that more adults participated in swimming than in any other leisure activity; however, the overall adult participation rate was up slightly from 30.9 percent in 1981 to 31.6 percent in 1982. Approximately three percent of the adult population reported swimming at an average rate of approximately once per week. Although this seems like a relatively small percentage of people, the activity occurrences of swimming generated by this small percentage of individuals is substantial. Table 1 contains the participation rate data for a variety of recreational activities for 1982.

The relatively small proportion of "core" or "highly committed" or "heavy users" is common to most product areas. Consumer analysts frequently segment markets along the dimension of product usage or participation rates. Users or participants may be differentiated by the frequency of consumption, usually into light, medium, and heavy use categories. The heavy use or "core" category of participants consists of enthusiasts who demonstrate the greatest commitment to the product or activity (Warnick, 1983). They usually comprise a small percentage of all users or participants, but generate a significant percentage of all activity occurrences. Marketers often base their marketing strategy upon this concept, which is called the "20-80 rule" -- focusing on the 20 percent of all customers who comprise the 80 percent of the total product consumption or participation (Mullin, 1983). For example, in the 1982 participation data for swimming, light users comprised 19.8 percent of all adult swimmers, medium users -- 44.2 percent, and heavy users -- 36 percent. However, when activity occurrences are tabulated, light users accounted for 1.9 percent of all adult swimming, medium users -- 30.9 percent, and heavy users -- 67.2 percent. The distribution of these use segments will be further explored in the section dealing with participant profiles of selected recreational activities.

Next to swimming, the activity most commonly provided by municipal leisure service organizations which showed the highest rate of participation was tennis. Approximately nine percent of all adults reported to have played tennis in 1982. The majority reported to have played less than 10 times per year. Golf participation followed a pattern similar to tennis. While only 8.1 percent of all adults played golf in 1982, one-half of all golf players limited their play to less than ten rounds per year. Racquet ball also held similar participation patterns to golf and tennis. Approximately seven percent of the adult population played racquet ball in 1982. The majority (63.6 percent) played less than 15 times per year. Although not presented in detail here and as might be expected, the more specialized recreational activities such as target shooting, archery, ice skating and sailing were found to attract a substantially smaller percentage of American adults (Simmons, 1982). Overall participation did not exceed five percent of the total U.S. population for any of these activities. In all cases, active or regular involvement was confined to a very small percentage of enthusiasts.

It is important to note again and to support Howard's initial findings that for many of the "mass leisure" activities, commonly provided by public leisure service organizations, participation is limited to a relatively small portion of the American adult population. Only in the case of swimming does the level of involvement

Table 1. -- Frequency of adult participation in selected recreation activities for 1982.
(N=161,656,000)

	<u>Recreational Activity</u>					
	<u>Golf</u>	<u>Tennis</u>	<u>Swimming</u>	<u>Rac'ball</u>	<u>Jogging</u>	<u>Bowling</u>
Total Estimate ('000)	13019	14744	51051	10595	18652	30536
Percent of Adult Pop.	8.1	9.1	31.6	6.6	11.5	18.9
Participation Rates Number of Days/Yr	-----Total Number Per Category ('000)----- (Percent Per Category Rate Level of Adult Pop.)					
1-4	4601 (2.8)	5278 (3.3)	10114 (6.3)	3188 (2.0)	3272 (2.0)	13934 (8.6)
5-9	1936 (1.2)	2914 (1.8)	9537 (5.9)	2251 (1.4)	1798 (1.1)	4094 (2.5)
10-14	1414 (0.9)	1669 (1.0)	7976 (4.9)	1360 (0.8)	2582 (1.6)	2371 (1.5)
15-19	917 (0.6)	1078 (0.7)	5045 (3.1)	745 (0.5)	1506 (0.9)	1238 (0.8)
20-24	961 (0.6)	1173 (0.7)	5174 (3.2)	839 (0.5)	1743 (1.1)	1513 (0.9)
25-29	635 (0.4)	389 (0.2)	2594 (1.6)	459 (0.3)	1127 (0.7)	1187 (0.7)
30-39	825 (0.5)	537 (0.3)	2944 (1.8)	431 (0.3)	1057 (0.7)	2329 (1.4)
40-49	440 (0.3)	430 (0.3)	1771 (1.1)	174 (0.1)	688 (0.4)	1123 (0.7)
50-59	172 (0.1)	420 (0.3)	985 (0.6)	284 (0.2)	722 (0.4)	498 (0.3)
60+	1118 (0.7)	857 (0.5)	4913 (3.0)	864 (0.5)	4158 (2.6)	2252 (1.4)
NEVER	148637 (91.9)	146912 (90.9)	110605 (68.4)	151061 (93.4)	143004 (88.5)	131120 (81.1)

substantially exceed ten percent. For all other reported activities, which are commonly provided by public leisure service organizations, non-use rates ("never participated during the 12 month period") typically range from 90 to 98 percent. Equally important here is the fact that in all of these activities, heavy or highly active participation is limited to a very small number of the total adult U.S. population, although these small percentages of participants do in fact generate the majority of all activity occurrences. While this information is useful and important and does support and expand upon Howard's findings (1985), more significant findings can be made when these participation rates, participant profiles or market segments, and market share analyses are examined over time.

Participation Rates, Participant Use Segments, and Market Share Comparisons for Selected Recreational Activities from 1979 to 1982

The participation rates, participant profiles or market segments, and market shares were compared from 1979 to 1982 for three selected recreational activities: golf, tennis, and racquet ball. (Market share data for racquet ball were only available from 1980 to 1982.) Several significant findings are noted from this trend analysis.

Participation Rates in Selected Recreational Activities. First, for two of the activities -- golf and tennis, the adult participation rates have declined steadily from 1979 to 1982. The decline was most dramatic for tennis with a decline of approximately four percent during the four year period. The decline in golf participation amounted to approximately one-half percent of the adult population. Racquet ball, on the other hand, had an increase in adult participation of approximately two percent during the period of 1980 to 1982.

Participant Use Segments of Selected Recreational Activities. Although trend analyses of participation rates were revealing, further insights were gained when the participant use segments in each of these three activities were examined over this time period. Participant segments were divided into three user or market segments: "light users" -- 1 - 4 days of participation during the 12 month period; "medium users" -- 5 - 19 days of participation; and "heavy users" -- 20 or more days of participation.

When the profiles or market segments of golfers were examined, the percentages of light and medium players of all participants fluctuated up and down over the four year period. However, the percentage of players who were heavy golfers remained relatively constant -- approximately 32 percent. The percentages of all tennis players who were light users increased and the percentage of heavy users decreased over this period. For racquet ball, there was a rather steady increase of heavy users over the four year period. However, there was a dramatic decline of approximately ten percent in the number of light users from 1980 to 1982. This examination of the participant use segment in each of these activities provides evidence to support the product life cycle concept and the core/fringe concept developed by Howard and Crompton (1981) and Warnick (1983). For example, it appears that racquet ball may be entering the mature stage of the product life cycle. There has been a rather dramatic drop in the number of light use (fringe) segment and a sustained but steady increase in the heavy use (core) segment. The increase of light users for tennis also seemed to indicate a resurgence in the its product life cycle. In summary of this section, although overall participation rates within an activity may be increasing or declining, opposite participation rates within participant segments of the activity may be occurring. Table 2 contains the participation rates and the distribution of market segments for the three activities.

Table 2. -- Participation rates and participant market segment profiles for 1979 to 1982.

Year	Participants (⁰⁰⁰)	Percent of Total Pop.	Light Users ^a (⁰⁰⁰) ----(Percentage of Total Participants)----	Medium Users ^b (⁰⁰⁰)	Heavy Users ^c (⁰⁰⁰)
GOLF:					
1979	13309	8.5	4560 (34.2)	4533 (34.1)	4216 (31.7)
1980	13093	8.3	4096 (31.3)	4850 (37.0)	4147 (31.7)
1981	13135	8.2	4459 (34.0)	4904 (37.3)	3772 (28.7)
1982	13019	8.1	4601 (35.3)	4267 (32.8)	4151 (31.9)
TENNIS:					
1979	19735	12.7	6317 (32.0)	8027 (40.7)	5391 (27.3)
1980	18133	11.4	5881 (32.4)	7549 (41.6)	4704 (25.9)
1981	16273	10.2	5704 (35.1)	6467 (39.7)	4102 (25.2)
1982	14744	9.1	5278 (35.8)	5661 (38.4)	3806 (25.8)
RACQUET BALL:					
1979	7858	5.0	2645 (33.7)	3261 (41.5)	1952 (24.8)
1980	9525	6.0	3830 (40.2)	3315 (34.8)	2382 (25.0)
1981	9717	6.1	3671 (37.8)	3375 (34.7)	2671 (27.5)
1982	10595	6.6	3188 (30.1)	4356 (41.1)	3051 (28.8)

^a Light users have participated 1-4 days during 12-month period.

^b Medium users have participated 5-19 days during 12-month period.

^c Heavy users have participated 20 or more days during 12-month period.

Market Share Analysis of Selected Recreational Activities. Respondents who played golf, tennis and/or racquet ball were also asked to indicate where their participation occurred -- whether it was at a municipal, country club, private facility, daily fee or other facility. Respondents could select more than one facility category.

Table 3 shows that municipal or public suppliers of leisure services provided a major share of the market for tennis. Tennis players, by a large margin, indicated their play took place on municipal or public courts. For example, over 39 percent of all tennis played in 1982 by adults occurred on public courts in contrast to 12 percent played on private courts and 7 percent played on country club courts.

In the case of golf, municipal providers were again found to provide a large share of the total participation -- an average of approximately 25 percent over the four years. However, country clubs and daily fee courses accounted for 50 percent of all golf played. Private clubs, which were identified as the place of play, accounted for an average of 14 percent per year of all golf played.

For racquet ball, the market share for public leisure service agencies averaged less than 12 percent per year over the three years with only an eight percent share in 1982. As might be expected, private clubs dominated the racquet ball market with an average market share of 42 percent per year for the three years. This average reflected the 1982 market share, which was down slightly from 1981.

The most significant factor noted here for each of these three recreational activities over the four year period was that the market shares (market share percentage) were declining for the municipal or public provision of each of these activities. The market share for the public provision of golf in 1979 was 26 percent and in 1982 it was 22 percent. For tennis, the market share for public agencies was 44 percent in 1979 and in 1982 it was 39 percent. The market share for the public provision of racquet ball was 12 percent in 1980 and eight percent in 1982. Although the market shares of the other identified categories has fluctuated in most cases, some important trends do emerge. First, the market share of the "do not know" category has increased steadily for both golf and tennis. Second, the percentage of golf and tennis played at "other" facilities (e.g., hotels, resorts, company facilities, etc.) has also increased. Finally, as might be expected, the amount of racquet ball played at private clubs and at "other" facilities has also increased from 1980 to 1982.

DISCUSSION

It is again evident from these data that the vast majority of American adults do not participate in many of the most common leisure activities as suggested by Howard (1985). With the exception of swimming and jogging, non-use rates for those activities most commonly provided for by public leisure service agencies ranged from 90 to 98 percent in 1982. These findings generally support the conclusions drawn by Howard in his examination of 1981 Simmons data. Heavy use or regular active participation was again found to be restricted to a very narrow segment of the total adult population. Although heavy use participant segments do comprise a very small segment of the total U.S. adult population as noted by Howard (1985), there is evidence that this segment generates the majority of activity occurrences. Equally important is the fact that the examinations of participant use segments and market share comparisons do reveal some significant trends when measured over time and do provide numerous points of discussion.

Table 3. -- Market share analysis of golf, tennis, and racquet ball from 1979 to 1982^a

ACTIVITY						
Year	Municipal	Country Club	Daily Fee	Private Club	Other	Do Not Know
-----Percentage-----						
GOLF:						
1979	25.8	22.6	30.6	13.7	2.4	4.8
1980	25.4	26.3	27.1	13.7	1.7	5.9
1981	26.4	26.4	22.7	16.9	5.4	8.2
1982	21.8	24.8	25.7	9.9	5.9	11.9
TENNIS:						
1979	43.6	9.8	6.8	12.9	17.8	9.2
1980	42.6	8.5	9.2	13.5	13.5	12.8
1981	41.8	8.4	4.2	12.6	21.8	11.8
1982	39.2	6.9	4.9	11.7	21.6	15.7
RACQUET BALL:						
1980	11.9	6.0	17.9	38.8	11.9	13.4
1981	14.5	4.4	13.0	44.9	17.4	5.8
1982	8.3	5.6	15.3	41.7	16.7	12.6

^a Market share data for racquet ball were available for 1980 to 1982.

While overall participation levels do seem disappointing, it appears that local public recreation agencies still hold a substantial share of the existing market demand for selected recreational activities. The four years of Simmons data do place the findings of earlier studies in an entirely different light and serve to support the initial conclusions of Howard (1985). Howard and Crompton (1984), for example, found non-use patterns for most publicly provided recreational activities ranged from 89 to 97 percent in three U.S. cities. Howard (1985) stated that, when these findings were re-examined in the broader context of the Simmons data, it was evident that the non-use condition was not so much a failure of local government provision or recreation, as it was a consequence of low overall use rates. This conclusion was further supported when the data were examined beyond the one year analysis conducted by Howard (1985) for each of the years from 1979 to 1982. In fact, the Simmons data indicated that municipal leisure service agencies have provided a very generous share of the total market demand for golf and tennis for each of the four years examined.

On a somewhat different note, a particularly perplexing problem was that the overall market shares for the public provision of each of the three recreational activities examined declined over the four year period. What has caused this decline? Several speculative reasons may be considered. First, with the exception of racquet ball, the percentage of the adult population playing these activities has declined steadily during this four year time period. The adult population is older and participation in general declines with age (Kelly, 1980). In addition, the selection and diversity of recreational activities have increased over the past decade. Evidence of this diversity exists when earlier studies of participation rates of recreational activities are compared with the most recent studies. In earlier studies conducted by the U.S. Department of Interior (1979) and Axiom Market Research Bureau, Inc. (1975), data on a number of recreational activities, such as jogging, distance running, cross country skiing, and fly fishing to name a few, were not collected due to what may be assumed as insignificant participation levels. Participation data are now collected by these firms on these activities in their most recent studies. Although it is debatable whether or not the adult population is more or less active, the data do seem to indicate that U.S. adult population's choices are greater and more diverse. This diversity may also explain why participation rates in certain recreational activities have actually declined. Furthermore, it may be assumed that most adults probably play a number of different activities and probably change their activity participation on a regular or seasonal basis. The data support this assumption in that a very small minority of the adult population maintain an average rate of at least once per week for 12 months in a specific recreational activity.

Second, the competition from the private sector has increased and is documented from these data. The market share held by the private sector categories seems to have increased at the expense of the public sector. It may be further assumed that the private sector has employed aggressive marketing techniques and promotional tactics to attract an increasing number of participants, even during periods of total market decline such as in golf and tennis. This aggressive marketing position assumption may also be supported by the growth in market share held by the private sector and decline in market share held by the public sector in one particular activity -- racquet ball.

Budget cutbacks and fiscal policies held by the public sector over the last decade may have also reduced the overall number of provisions and opportunities for the general public to participate in these recreational activities. This may also explain the overall decline in participation rates for golf and tennis and the decline in market shares for public leisure service agencies in each of these activities. These declines may be a result of reduced opportunities for the public brought on by the reduction in

governmental support and a reduction in the overall number of facilities and provisions for these activities. The low priority given to recreation and park provisions in government budgets and the increase in the private sector's market share may also indicate that recreation is indeed a private business matter best served by the private sector and market demands.

The market share decline of the public provision of recreational activities may also be attributed to the fact that the public sector has not exercised marketing strategies which would serve to maintain or increase market share. Likewise, marketing strategies if selected and pursued may not have been correctly or wisely formulated. For example, it has been noted that a small percentage of the participants or "heavy users" account for a significant proportion of all activity played (activity occurrences). If a public agency strives to attract new participants from a pool of non-users, it may be more successful by dropping this effort and concentrating on strategies which encourage increased participation of light and moderate users or participants. The data indicated that within particular recreational activities, even activities which have overall declining participation rates, different use segments are actually growing at a different and opposite rates.

Another speculative, but interesting idea worth consideration in the examination of recreational activity market shares deals with the consistent increase in the number of participants "who do not know" who are the providers of the facilities which they utilize. The percentage of the "do not know" category has increased steadily over the four years for both golf and tennis. For racquetball, the percentage in this category has declined. It may possibly be assumed that this accounts for a portion of the decline in the market share held by public agencies. In other words, many participants in the "do not know" category may actually be playing at public facilities but "do not know" who are the providers of these facilities. This highlights another potential marketing problem -- poor promotional planning and lack of "brand" recognition. If this is the case, then the promotional efforts of the public agencies may be the source of major marketing problems. It is essential that public recreation and park agencies do have adequate communication objectives designed for their services and programs. The simple lack of communication objectives and an established promotional strategy may have significant impact upon the financial support at budget appropriation time for public recreation and park agencies.

An analysis of the market share of recreational activities may also help public recreation agencies formulate overall product or service portfolio strategies. Most recreation agencies are "multi-product" or "multi-service" organizations and over time will add and delete a variety of recreational products and services. The task of an agency which is developing a market portfolio strategy is to determine which programs should be given increased support (build), maintained at the present level (hold), phased down (harvest), and terminated (divest) (Kotler, 1982). One of these portfolio strategies was developed by the Boston Consulting Group which rates the agency's products and services along two dimensions, namely, market growth and market share. By dividing the market growth into growth rates and the market share into share rates, the Boston Consulting Group classifies products and services into four types of categories: 1) "stars" -- programs with high market share in a fast growing market; 2) "cash cows" -- programs with high market share in a slow growing market; 3) "question marks" -- programs with a small market share in a fast growing market; and 4) "dogs" -- programs with a small market share in a slow-growth market. With the overall analysis conducted here, a public agency may begin to analyze and formulate portfolio strategies. For example, from these data there is an indication that tennis and golf are "cash cows" and racquetball is a "question mark" for most public

agencies. However, these data also seem to indicate that the public provision of these activities may be moving toward the "dog" category -- a particularly alarming factor for public recreation and park agencies.

The results of this analysis should provide both public and private agencies with a sense of how well they are serving the demand for selected recreation activities. In an overall sense, information in this study indicated how well the public and private sectors were serving the market demand for each of these three recreational activities. Howard (1985) suggested that in addition to assessing overall participation patterns within recreational activities, managers should also strive to understand the importance of carefully analyzing the distribution of existing users along a continuum from "light" to "heavy users." Managers within particular leisure service industries should seek to analyze the "mix" of light, moderate, and heavy users or fringe/new to repeat/core participants in each recreational service provision area. Indeed, the analyses by participant use segments has revealed some interesting findings. For example, even though the overall participation rate of an activity may be declining, there may be a pronounced growth rate within one of the activity's participant use segments. The analysis of this type of information if incorporated into a marketing information system may provide the key to maintaining and building market shares, constituencies or loyal customers, and public support or repeat business for leisure service organizations. Clearly, this analysis has indicated that user segments within each recreational activity are distributed differently and have different growth rates.

Howard (1984) also recommended that agencies should concentrate on "customer retention" strategies instead of trying to attract new customers. The analysis of the data over this four year period also supported Howard's recommendation particularly in light of the fact that overall participation rates for many recreation activities are declining.

Although a variety of reasons have been presented which speculate as to the reasons for the public sector's market share declines for the three selected recreational activities, it is doubtful that any one of these reasons alone has significantly contributed to these declines. Rather it is most likely a combination of these reasons and other underlying factors which when combined have contributed to these market share declines. Certainly it is important that both public and private leisure service organizations come to realize the importance and value of the application of marketing strategies and techniques in an increasingly competitive market in light of these data findings.

CONCLUSIONS

The findings reached by analyzing participation data of three selected recreational activities over the period of 1979 to 1982 do support the initial conclusions presented by Howard (1985). The vast majority of the U.S. adult population does not participate in the "mass leisure" activities commonly provided for by the public sector. Overall participation rates in golf and tennis have declined while the participation rate in racquet ball has increased from 1979 to 1982. While overall participation rates may have declined in some of these activities, participation rates of specific participant use segments have actually increased or remained constant. Evidence exists from these data that a relatively small proportion of an activity's participants generate the majority of all activity occurrences. Public leisure service organizations have held a substantial share of the market for the provision of golf and tennis from 1979 to 1982; however, their market shares for the provision of golf, tennis, and racquet ball has declined over this period. The trend analyses of these recreational activities should

provide numerous insights into how leisure service organizations may incorporate these findings into a marketing information system and into the development of sound marketing strategies.

LITERATURE CITED

- Axiom Market Research Bureau, Inc. 1975. Target group index 1975: sports and leisure. New York. Vol. P-10, No. 82.
- Howard, Dennis R. 1985. An analysis of the market potential for public leisure services. Journal of Park and Recreation Administrators. Vol. 3, No.1 (forthcoming publication).
- Howard, Dennis R. and John L. Crompton. 1984. Who are the consumers of the public park and recreation services? An analysis of the users and non-users of three municipal service organizations. Journal of Park and Recreation Administrators. Vol 2, No. 3: 33-48.
- Howard, Dennis R. and John L. Crompton. 1981. Financing, managing, and marketing recreation and park resources. Dubuque, Iowa: William C. Brown, pp. 380-381.
- Kelly, John R. 1980. Outdoor recreation participation: a comparative analysis. Leisure Sciences. Vol. 3, No. 2: 129-154.
- Kotler, Philip. 1982. Marketing for nonprofit organizations (second edition). Englewood, Cliffs, NJ: Prentice-Hall, pp. 94-96.
- McCarthy, E. Jerome. and William D. Perrault. 1984. Basic Marketing. Homewood, IL: Richard D. Irwin, p. 558.
- Mullin, Bernard J. 1983. Sport marketing, promotion, and public relations. Amherst, MA: National Sports Management, pp. 107-114.
- Simmons Market Research Bureau, Inc. 1979. The 1979 study of media and markets: sports and leisure. New York. Vol. P-10.
- Simmons Market Research Bureau, Inc. 1980. The 1980 study of media and markets: sports and leisure. New York. Vol. P-10.
- Simmons Market Research Bureau, Inc. 1981. The 1981 study of media and markets: sports and leisure. New York. Vol. P-10.
- Simmons Market Research Bureau, Inc. 1982. The 1982 study of media and markets: sports and leisure. New York. Vol. P-10.
- United States Department of Interior. 1979. The third nationwide outdoor recreation plan. Washington, DC: Heritage Conservation and Recreation Service.
- Warnick, Rodney B. 1983. Marketing factors in the evaluation of exercise/fitness programs: an examination of core and fringe participation by importance-performance analysis. Doctoral dissertation. The Pennsylvania State University, University Park, PA.

Gary H. Elsner
Recreation Economist
U.S.D.A. Forest Service
Washington, D.C. 20013

Abstract.--Recreation use on the National Forests has grown steadily over the last sixty years. Two exceptions have occurred, once during the second World War and recently during the economic recession. Several hypotheses concerning the recent use data are proposed. Long-term predictions indicate a continued steady increase in use on the National Forests.

Additional keywords: Recreation use trends, National Forest System, Renewable Resources Planning Act (RPA)

INTRODUCTION

A sample of questions answered in this paper --- How has the total recreational use on the National Forests varied over the last six decades? What are the major changes in the mix of recreational activities? How have the levels of use in recreation activities varied over the last four decades?

TOTAL RECREATION USE ON THE NATIONAL FORESTS

In 1924 there was a recorded 4.7 million visits to the National Forests. As the country has grown, the level of recreation use has also grown. Now there are over 227 million visits every year. Simply put, recreation use has increased over 4,783 percent!

The trend in recreation use between 1924 and 1984 is shown in figure 1. This figure shows a steady increase in use -- with one exception. World War II had a significant impact. The use in 1943 was only one third of the level recorded earlier in 1941. After the war, use resumed its climb and in fact the annual growth rate was higher than in pre-war years.

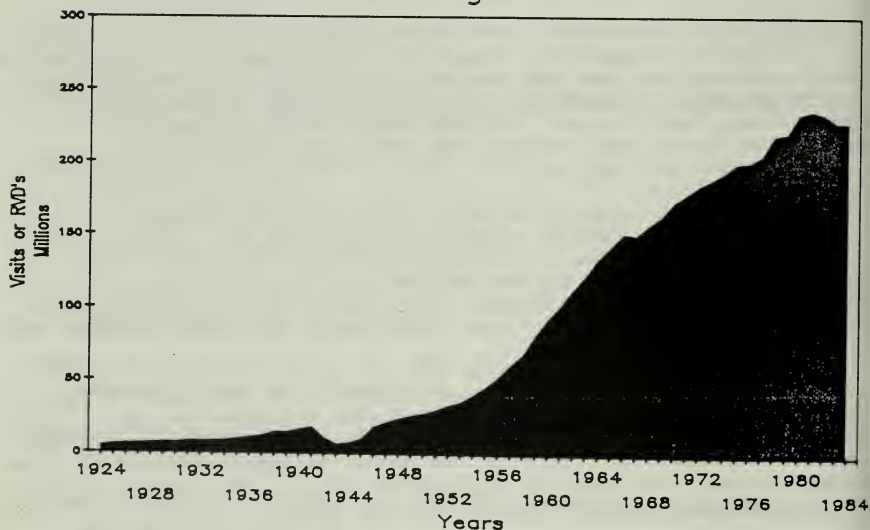
Before proceeding further in interpreting this recreation use data it is important to clarify a couple of points.

First, the basic concept of an "RVD". An RVD (or recreation visitor day) is simply twelve hours of recreation use. It may be six people recreating for two hours each or one person recreating for twelve hours, or any other combination that adds up to twelve hours of use. Use is always measured by recreation activity.

So, there are RVD's of camping, fishing, skiing, etc.

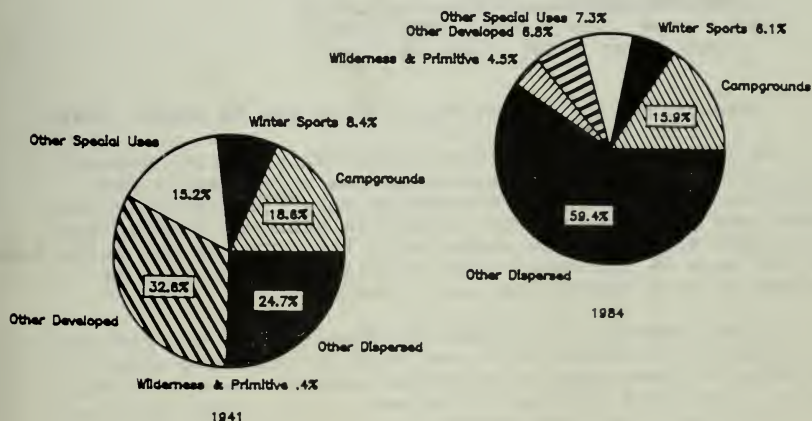
Second, the recreation accounting system (formally called RIM for recreation information management) changed it's unit of measurement in 1965. Before that time the unit was "visits" and since 1965 it has been RVD's. For the purpose of this paper on trends I have plotted and interpreted the measurements in their original form -- i.e. visits have not been converted to RVD's. This approach was selected because the two parts of the trend lines fit together very closely. The first year of recording RVD's seems to be arbitrarily high compared with later and earlier years. Thus, the estimates for 1965 presented in this paper are interpolations between 1964 and 1966.

Figure 1.
Recreation Use on the National Forests
1924 through 1984



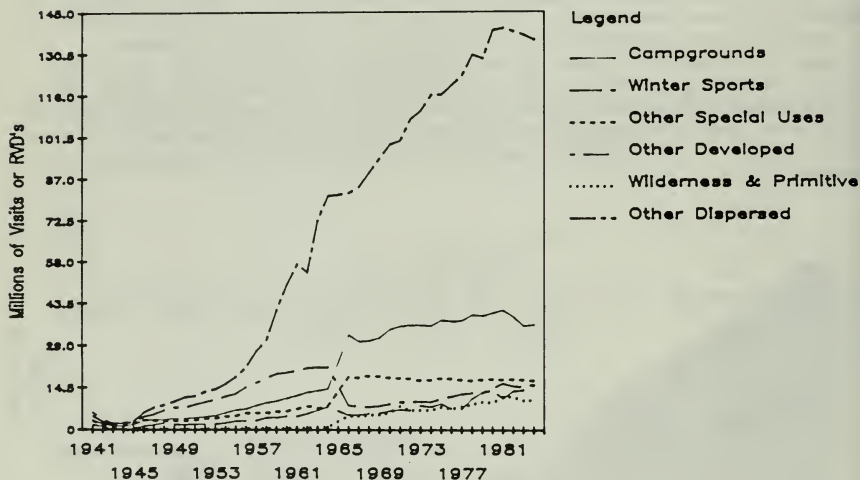
The most obvious change in the mix of activities between 1941 and 1984 is in the proportion of total use which occurs in the dispersed recreation areas (figure 2). (The first year that all six categories of use discussed in this paper were consistently recorded was 1941.) In 1941 the total for all dispersed us (Wilderness and primitive and all other) was 25.1 percent. By 1984 dispersed use had more than doubled to 63.9 percent. Of course, the passage of the Wilderness legislation and the following creation of many Wilderness areas has contributed to this use. In nearly every case the creation of a new Wilderness area has lead to an absolute increase in total recreation use -- not just a redistribution. This is probably partly due to the increased public information available on this type of recreation opportunity -- in essence -- advertising. This has lead to Wilderness and Primitive area use increasing over ten-fold, from .4 percent to 4.5 percent. Additionally, a reason for the increase in dispersed use is that many members of the public now perceive the uniqueness of National Forest recreation opportunities in settings with large areas of often natural appearing land. During this same period the level of winter sports use has increased dramatically, and the percent of total use has remained relatively constant. The percent of the total which is campground use has also remained relatively constant.

Figure 2.
Change in Mix of Recreation Activities
1941 and 1984



While the percent of Wilderness, Primitive and other dispersed activities has been increasing -- so has the absolute levels of each. Most pronounced has been the steady and rapid increase in dispersed recreation outside of the Wilderness and Primitive areas (figure 3). The next highest level of use is oriented around campgrounds. Camping use made a decided upward move in the mid-sixties and has continued to climb upwards ever since.

Figure 3.
Change in Level of Recreation Activities
1941 through 1984
National Forest System



CONCLUSION --- UNDERSTANDING TOTAL USE IN RECENT YEARS

As noted earlier, use has continued its climb steadily since 1924 -- with the exception of the second World War. Currently we see another interesting exception taking place. Since 1982 total recreation use on the National Forests has either decreased or been essentially flat. We're not quite sure yet why this is the case. But we will offer a number of hypotheses that researchers may investigate.

First, possibly it's just the data -- i.e. the RIM data is collected on an annual basis and often the current year's estimate is based upon an estimated percent above (or below) last years. With this approach if an early year is off then all following years will be incorrect.

Second, use may in fact be leveling off (at least temporarily). This could be explained by the recession the country experienced from the middle of 1981 to the end of 1982. Specifically the sharp increases in unemployment in this period may explain the decreases in recreation use from 1981 and again in 1982. However, since disposable income per capita increased significantly in early 1983 and continued throughout 1984 it indicates that recreation use should have similarly increased in 1983. This was not the case and indeed both 1983 and 1984 use data show lower levels than for even 1982. In other words the recession explains the decrease in use; but when disposable income increased then recreation use would have been expected to increase.

Third, because of tight budgets it has not been possible to adequately maintain many recreation facilities. This has led to the closing of some sites and possibly a decrease in demand for others. Beyond these three hypotheses there are undoubtedly others equally plausible.

Research work is needed to determine the causes for the recent decreases and leveling in use to determine whether it is a temporary phenomenon or of a more permanent nature and to determine whether the leveling of use has been real or a problem in data collection.

Until this work is completed we will continue to rely upon present predictions which indicate that use will continue to increase over the long-run. In fact, for the RPA (Renewable Resources Planning Act) the predictions for the year 2030 are in the range of 350 to over 420 million RVD's depending upon the level of recreation services provided.

LEGAL LIABILITY TRENDS IN OUTDOOR RECREATION

Bruce B.Hronek

Abstract.--The number of tort claims against providers of outdoor recreation has increased significantly in the past decade. Particularly significant are claims involving "high risk" activities such as skiing, river use, and wilderness. Courts are taking a new view of the definition of outdoor recreation liability. Outdoor recreation has not escaped all categories of tort claims.

Providers of outdoor recreation are increasingly faced with suits and the threat of suits as a result of increasing public interest to be compensated for what many believe are negligent acts by owners of outdoor recreation property and facilities. It makes little difference if you are a private, a local government, a State government, or Federal provider; all are subject to personal injury claims.

As viewed from a historical perspective, we can see that the federal court system is overwhelmed by the number of cases pending. A hundred years ago (1882) there were fewer than 2500 civil cases in which the United States was a party. One hundred years later there were nearly 60,000 - or almost twenty four times as many. Annual civil filings in the Federal District Courts more than tripled between 1960 and 1981. During the same period appeals increased seven-fold. Claims settled out of court through administrative decisions have likely paralleled the court cases in number and in cost, however no tracking device is available at this time to determine the number of claims settled out of court. It is natural that outdoor recreation has been caught up in the stampede to sue someone.

"Liability" is a word with broad legal meaning. It could be defined as an obligation one is bound in law to perform. In a practical sense, it means that a person who has been harmed by an act of another, either by commission or omission, can sue and recover from the wrongdoer. The owner of recreation property must take reasonable actions necessary to protect his property and the rights of his guests. If a recreation property owner has a duty, and breaches that duty, there is negligence. Negligence that results in injury is considered liability. In regards to a property owners rights and obligations to protect his invitees from harm by others; the Restatement (Second) of Torts (1965), Section 156 states:

"One who is under duty to protect a third person on his land or chattels against harm from the misconduct of another is privileged to use such force against or to impose such restraint upon that other as is (a) reasonable in view of the threatened harm and (b) reasonably necessary for the performance of his duty".

By tradition, governments were protected from tort claims by the doctrine of sovereign immunity. That is to say, governments could not be sued without their permission (the King can do no wrong). In 1946 the Federal Tort Claims Act was enacted by Congress. The purpose of the Federal Tort Claims Act was to relieve Congress from the burden of considering private bills for relief from damages resulting from the negligence of the Federal Government and its agents. See Downs v. United States, 522 F.2d 990 (1975). Title 28 of the United States Code, Sections 2671 through 2680 provide a description of the procedures to make a claim against the United States. All but six States have similar legislation that allows the State Government and their subdivisions to be sued for damages. Each State varies as to the extent their laws allow claims. In actual practice, sovereign immunity for suits in tort, as it was exercised at the turn of the century, no longer exists.

When public entities exercise their discretionary functions such as policy, budget, and planning, they are usually exempt from tort claims. Outdoor recreation professionals should understand that they are particularly vulnerable to tort claims when man-made facilities are poorly designed or maintained. When supervision and/or warning signs are normal for the type of activity involved (i.e. swimming beach with lifeguard, bridge under construction), inadequate supervision or signing may be a dangerous gamble by the recreation manager. Some states allow suits in tort, but put an absolute ceiling (e.g. \$75,000) on amount recoverable.

In Rinkus v. Northwest Colorado Ski Corporation 706 F.2d 1060 (1983) an expert skier was seriously injured in a fall off a rock outcrop. The plaintiff was skiing with an instructor employed by the defendant at the time of the accident. The plaintiff successfully argued that the ski area was negligent for failing to mark (sign) this particular hazard. The jury found the ski resort 80% negligent in failing to mark the outcropping of rock on the expert ski slope and found the plaintiff 20% negligent in contributing to his own accident. Upon appeal by the defendant, the Appeals Court affirmed the judgment of the Federal District Court in favor of the plaintiff.

The responsibility to properly provide warning signs in a outdoor recreation area to protect public interest is indeed a perplexing issue to the field manager. Managers can certainly destroy the recreation experience by placing excessive warning signs in an outdoor setting. The possibility of tort liability often results in a paranoia that results in a proliferation of warning signs. The recreation professional cannot under any circumstance protect the public from its own stupidity, nor can professionals avoid the tendency of plaintiffs to consider the federal, state, and local governments as "fertile ground" to compensate for injuries that occur.

The Department of Agriculture's Office of General Counsel offered some common sense steps to the Forest Service to avoid the liability consequences arising from accidents on public lands. In their August 14, 1980 letter to R. Max Peterson, Chief, they suggested that the agency concentrate in three areas:

1. Where accidents have previously occurred -- in such cases, the agency is already "on notice" of the dangers and should appraise the public accordingly.
2. Areas of high public use. The statistical probability of an accident rises with the intensity of use.
3. Areas that pose extra ordinary danger due to unknown or unrecognized hazards that an ordinary, prudent person might not anticipate.

Many States have Recreation Use Statutes that exempt land owners from tort claims when the recreationist has not paid a fee for the privilege of outdoor recreation. In States with Recreation Use Statutes when owners of property allow access to their lands for purposes of hunting, picnicking, hiking, etc, and an individual is injured, unless wanton misconduct by the owner is proved, the property owner cannot be sued. Case law has applied the "owner" category to the State and Federal properties except for some very notable cases. Ducey v. United States, 713 F.2d 504 (1983). The Court wrote in Ducey, "The Federal Torts Claims act exception to sovereign immunity depends on application of state law. Federal Tort Claims Act claims based on State Recreational Use Statutes will thus continue to yield the disparate results shown in the cases surveyed in our opinion". The Court further stated:

"It is difficult to imagine that Congress, in passing the Federal Torts Claims Act, envisioned liability of the United States for injuries during recreation on the public lands. Nevertheless, the Federal Torts Claims Act

applied. If the liability of the United States is to be based on a uniform policy rather than the vagaries of Individual State Recreational Use Statutes, congressional action is definitely required".

In 1975 the United States Court of Appeals for the Ninth Circuit upheld a lower court decision in favor of the the United States in a case of drowning in a Wild and Scenic River managed by the U.S. Forest Service. The plaintiff claimed that the United States was negligent in allowing a river recreation float trip to use the river when government employees had knowledge that the river was dangerously high and had contact with the drowning victims prior to the start of thier trip and failed to warn. The trial court found that the dangerous condition of the river was obvious to any person of ordinary intelligence and that, under Idaho's contributory negligence law, the plaintiffs were barred from recovery. A year after the accident occurred the Idaho legislaure abolished contributory negligence and Instituted comparative negligence. Harmon v. U.S., No 4-71-23 (D.Idaho filed Jan 25, 1974) appeal docketed No 74-1523 (9th Cir. Dec 24, 1975)

The recent trends in similar cases have come to a significantly different conclusion than found in Harmon. In Mandel v. United States, 719 F.2d 963 (1983) while swimming at a designated swimming area at the Buffalo River National Park the plaintiff sustained a broken neck as a result of striking his head on a submerged rock. The broken neck resulted in a quadriplegic injury. The plaintiff alleged negligence because a Park Ranger had recommended the swimming site and not warned of submerged rocks. The trial court granted a summary judgment based upon the Arkansas Recreational Use Statute immunity. Upon appeal by the plaintiff, the Appeals Court reversed the summary judgment in favor of the United States and remanded the case back to the lower court with instructions to fully consider the plaintiff's allegations that willful and wanton misconduct on the part of the National Park Service caused the injuries.

In Elliott v. Taos Ski Vally Inc., 494 P.2d 1392 (N.M. Ct. App) affd, 497 P.2d 2974 (1974) a women student and her fully certified ski instructor were on the slopes when the student fell, suffering a leg injury. The instructor told her that she had only pulled a muscle and to continue to ski. After she was unable to ski the instructor took her skis and told her to walk to the lodge. After walking one-half mile she asked to be evacuated by a toboggan. She had to wait on the slopes for one-half hour before she was evacuated. The woman sued the ski area for aggravation of what turned out to be a fracture of the

left femur. The case was heard through the trial court, appeals court and the New Mexico State Supreme Court. After referral back to the trial court the case was settled by payment to the plaintiff out of court.

There are circumstances in which recreation providers are protected from tort claims through State Recreation Use Statutes. When the public agency does not collect a fee for the recreation activity and the agency has led the injured user to believe the property involved was safe, the individual states Recreation Use Statutes are applied to public agencies. In Ewell by and through Ewell v. United States 579 F.Supp. 1291 (1984) the Court determined that the United States owed no duty to the plaintiff, who was injured as a result of riding a motorcycle in a gravel pit on lands administered by the Bureau of Land Management (BLM). The plaintiff alleged that "the Federal Government negligently failed to post warning markers, erect barriers, prevent vehicular traffic in the area in question, and otherwise failed to keep the premises safe for use of recreational vehicles." The plaintiff was unable to show that the Federal Government had any knowledge of the alleged dangerous condition where the accident occurred. Therefore, the United States owed no duty to protect under the State's Recreation Use Statute.

In addition to the waiver of sovereign immunity by governments, most States have adopted the "comparative negligence" standard to replace the historical complete defense standard of "contributory negligence." This is particularly important in the high risk outdoor recreation activities. Modification of the concept of "voluntary assumption of risk" and elimination of the requirement of proof of fault has resulted in a significant increase in successful lawsuits.

The application of contributory negligence principles can best be illustrated in the case of Davis v. United States 716 F.2d 418 (1983). In Davis a man received severe injuries while diving into a lake at a Federal Wildlife Refuge. The Federal District Court established the plaintiff's damages at \$4,047,000. The Court of Appeals found the government guilty of willful and wanton conduct for failing to adequately warn the plaintiff of the danger. The plaintiff was trespassing on the federal lands, but this did not relieve the government from its duty to adequately warn plaintiff. The plaintiff was found guilty of not looking before diving head first into the lake. The Appeals Court apportionment of comparative negligence resulted in awarding only one-third of the established damages to the plaintiff because he was two-thirds responsible for the accident.

In Rutter v. Northeastern Beaver County School District, Pa., 437 A.2d 1198 (1981) the State Supreme Court virtually eliminated the doctrine of voluntary assumption of risk in the state of Pennsylvania. The Supreme Court stated "the complexity of the doctrine may not be worth the difficulty it causes, for assumption of risk is duplicative of the more widely understood concepts of scope of duty and contributory negligence... the difficulties of using the term 'assumption of risk' outweigh the benefits." The State Supreme Court in Rutter abolished the doctrine of implied assumption of risk in Pennsylvania except where specifically preserved by statute.

Early case law indicates that the Courts had little empathy toward those who were injured as a result of their pursuit of recreation activities. Many considered outdoor recreation a frivolous activity that subjects the participants to a number of natural hazards. Only after the land owners required payment for use of lands for outdoor recreation purposes did the Courts pay particular attention to tort claims. Little reason exists to provide immunity where owners of land suitable for recreational use make it available to the public on a business basis. The statutory purpose of recreation use statutes is to encourage gratuitous access to private lands. It is inconsistent to allow landowners to collect money for use or entrance to the land and still claim statutory immunity. Council of State Governments. Suggested State Legislation. Vol. XXIV, 150-52 (1965)

In Graves v. United States Coast Guard, 692 F.2d 71 (9th Cir. 1982) the Court held that the California Recreational Use Statute does not immunize the United States from liability for injuries arising out of the use of a riverside cabana, even though the only alleged "consideration" was the payment of a fee to private entrepreneurs for the privilege of camping near the river. The Court held that since the use of the cabana and access to the river were implied benefits received as a consequence of the payment of consideration to the campground operators, the camping fee was a consideration in return not merely for "permission to camp" but also to gain access to the river and to use waterside facilities with the meaning of the consideration exception to the California Recreational Use Statute. Also see Copeland v. Larson, 174 N.W.2d 745 (1970)

Legal liability trends in outdoor recreation provides a well defined challenge to managers. Not only are recreationists more willing to sue for injuries, but some categories of outdoor recreation (high risk activities) that were once somewhat immune to tort claims, are now subject to claims. Sovereign immunity, contributory negligence, and voluntary assumption of risk are defenses with little significance under present case law.

On the positive side, society recognizes that outdoor recreation is an important industry. State Legislatures have passed Recreation Use Statutes that go a long way to protect property owners. Courts have recognized that outdoor recreation provides a "special category", particularly in undeveloped area recreation.

The managers challenge is to recognize that public safety is an important responsibility of outdoor recreation administration. Legal risk analysis must be a vital part of conducting outdoor recreation business in our contemporary society.

Alan Ewert

Abstract.--Outdoor adventure recreation has become increasingly popular in recreational and leisure pursuits. As a result of a variety of influencing factors, several emerging trends have developed including: programming for special populations; shorter, more intensive adventure courses; and adventure courses suitable for more urbanized settings.

Additional keywords: Risk, adventure-based programming, risk activities, outdoor adventure education, high adventure.

That some people deliberately choose to engage in life-threatening recreational activities should surprise no one involved in outdoor recreation management. What maybe surprising is the fact that during the last ten years there has been a nationwide increase in recreational activities involving risk such as mountaineering, rappelling, rock climbing, and white-water rafting (Darst and Armstrong, 1980). This paper discusses the emerging trends of the outdoor adventure phenomenon. To accomplish this, the paper is divided into the following sections: A Current Assessment; External Forces Influencing Outdoor Adventure; Emerging Trends; and A Discussion of Future Expectations.

A CURRENT ASSESSMENT

Although some may view the instituting of risk in a recreational activity as dangerous and foolhardy, many risk recreators view risk-taking as a necessary and even desirable component within the outdoor adventure process. Within the context of this paper, outdoor adventure can be defined as:

A self-initiated activity usually engaged in a natural setting, that contains elements of real or apparent danger (i.e. risk), in which the outcome, while often uncertain, can be influenced by the actions of the participant and circumstance.

When adventure is used as a method of promoting the objectives of a particular program, the term Adventure--Based Programming is employed. Likewise, if outdoor adventuring is a primary tool in an educational context, the term Outdoor Adventure Education is often used. Outdoor Adventure Recreation (O.A.R.) implies using adventure as a means to achieve what are primarily recreational objectives.

Risk, or the threat of physical or emotional harm, emerges when there is a loss of control over the outcome of a particular activity. In the context of the outdoors, this loss of control can be aggravated by personal weakness, indecision, or unforeseen circumstances. Conversely, personal abilities, correct decision-making or technology can serve to offset this loss of control. (see Figure 1) While the participant can enhance or diminish his or her chances of success by the attributes just mentioned, the risk can be minimized but never completely eliminated. In fact, the object of outdoor adventure is not to eliminate the risk, but rather to

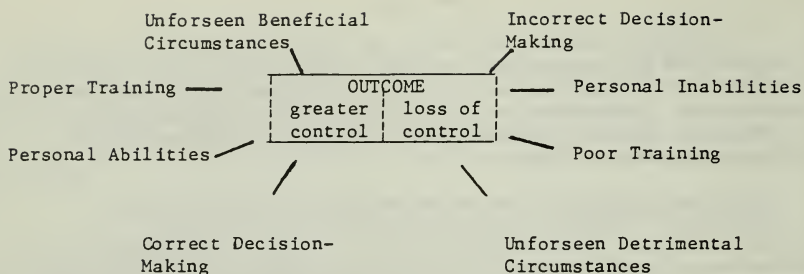


Figure 1.--Influencing factors on the outcome of a risk activity. (partial list)

manipulate it to an acceptable level (Helms, 1984). Benefits which might be experienced by participation in recreational activities featuring risk (a.k.a. Outdoor Adventure Recreation) include psychological, sociological, and physical components. These potential benefits are listed in Table 1. (see Table 1.) Although many of these benefits can be realized through other recreational opportunities, it is becoming increasingly evident that outdoor adventure recreation has become a new direction in the general context of recreation and leisure pursuits.

Table 1.--Potential Benefits of Outdoor Adventure Participation.

Psychological	Sociological	Physical
Self-concept	Compassion	Strength
Confidence	Group Cooperation	Coordination
Self-efficacy	Respect for Others	Cardiovascular
Sensation-seeking	Outdoor Education	Outdoor Skills
Diversion	Nature Awareness	Sensory Awareness
Value Clarification	Communication	Health
Problem-solving	Behaviors	Catharsis

Society has responded to this new recreational development by organizing agencies and institutions which cater to the individual in search of outdoor adventures. As early as 1975, over 200 colleges and universities offered courses or degrees in outdoor adventure activities (Hale, 1978). This is but one example of the indicators which suggest the popularity of outdoor adventure activities. Other indicators of the extent and pervasiveness of outdoor adventure are listed in Table 2. (see Table 2.)

These indicators are but part of a larger picture which suggests that North Americans may becoming more quality-conscious in their leisure time. What this means is that individuals are turning from a quantity orientation (i.e. material goods) and moving toward greater emphasis on quality concerns such as self-improvement or family/community activities (Kelly, 1982:12). This movement away from material-based leisure pursuits is reflected in outdoor recreation statistics, with categories such as camping, hiking, mountain climbing, and scuba diving all showing markedly increased participation rates (Clawson and Van Doren, 1984).

Cordell and Hartmann (1983) upon reviewing A.C. Nielsen national surveys report that the ten most popular sports and outdoor recreation activities are, in order: swimming (45% of U.S. population), bicycling (32%), fishing (28%), camping (27%), boating (19%), bowling (18%), physical conditioning with equipment (15%), jogging/running (15%), roller-skating (13%), and pool/billiards (13%). Among these and other sports surveyed, ice-skating, swimming, and pool/billiards decreased while bicycling, boating, skiing, and sailing increased strongly.

Along similar lines, Brady and Skjemstad (1974) suggest that the number of cross-country skiers rose from 2,000 to 500,000 between the years of 1964 and 1974. Similarly, between the years 1971 and 1973, the Southern California Hang Glider Association increased from 25 to 4000 members (Dunn and Culbis, 1976). Future participation indices for other outdoor adventure activities are presented in Table 3. (see Table 3)

Aggregated projections, however, do not complete the picture. To fully understand the extent of outdoor adventure recreation (O.A.R.) Table 4 illustrates participation rates of some selected O.A.R. activities in one type of outdoor recreational setting, the National Forests. (see Table 4)

Clearly, as can be seen from the preceding tables, outdoor adventure recreational activities are participated in by a substantial number of people. Similarly, these participation rates appear to be stabilized or increasing, although a note of caution is advised by Cordell and Hendee (1982) in their statement:

...National surveys contain expected errors in estimated participation rates (with) wide differences between survey results hampering demand forecasting and recreation planning based on them. (p.44)

Table 2.--Indicators of Popularity of Outdoor Adventure Activities.

INDICATOR	IMPLICATIONS
<u>Increase in:</u>	
Regulations	Greater use of resources with subsequent damage
Organizations/Camps	Heightened use of facilities and programs
Sales/Expenditures	More participants and/or participants using more equipment and clothing
Universities/Colleges	Greater interest in outdoor adventure education
Advertising/Commercials featuring outdoor adventure activities	Increasing public awareness and acceptance as desirable activities or traits
Literature/Media	Same
Ropes courses/Localized adventure activities	Supplying a need to experience "adventure" despite geographical or financial limitations
Workshops/Courses/Programs	Demonstrates a public desire to seek greater knowledge and skills
Legislation	Increased attention being paid by governmental agencies

Table 3.--Indices of Future Participation Rates For Selected Outdoor Adventure Activities 1977-2030 (base year = 1977 = 100%).

Activity	Projection Level ^a	Projections By Year					
		1977	1990	2000	2010	2020	2030
Population Index ^b	Medium	100	112	120	127	134	139
Camping-Undeveloped Sites	High	100	130	161	207	254	311
	Medium	100	116	133	157	182	205
	Low	100	111	121	132	145	155
Hiking	High	100	124	149	187	225	270
	Medium	100	109	117	132	146	159
	Low	100	101	102	103	107	109
Horseback Riding	High	100	125	151	194	233	284
	Medium	100	109	118	137	155	173
	Low	100	102	102	105	113	119
Canoeing & White-water Boating	High	100	140	182	243	305	384
	Medium	100	121	140	170	200	233
	Low	100	109	117	128	141	155
Cross-Country Skiing	High	100	154	211	290	376	479
	Medium	100	133	161	200	241	280
	Low	100	118	134	151	172	190
Downhill Skiing	High	100	162	227	318	416	538
	Medium	100	142	178	228	279	334
	Low	100	125	146	171	199	226
Snowmobiling	High	100	126	151	191	229	277
	Medium	100	109	120	141	161	181
	Low	100	107	114	122	133	141

^a

Keyed on anticipated population and economic projections.

^b

Medium level projection rate.

Source: U.S. Department of Agriculture, Forest Service, An Assessment of the Forest and Range Land Situation in the United States. Washington, D.C.: Government Printing Office, 1980. pp.100-101, Table 3.2.

Table 4.--Estimated Visitor Days of National Forest Recreation Use, By Activities, 1965 to 1982.^a

Activity	1965	1970	1975	1980	1981	1982
(thousands of visitor days)						
Camping	40065	46454	53092	57211	59628	57089
Snowmobiles	516	1950	3276	3448	3141	3328
Swimming/SCUBA	3273	3459	3930	5140	5334	5209
Climbing(hiking & mountain)	4086	5592	9059	12259	12791	12734
Horseback Riding	2242	2388	2617	3346	3651	3671
Skiing (total)	4329	5515	7790	12211	9935	12772
cross-country(snowshoe)	--	--	--	11000	8586	--
down-hill	--	--	--	1204	1349	--
Self-propelled Boats	1733	1405	2988	3965	4048	3868

Source: U.S. Department of Agriculture, Forest Service

^a

Visitor Day = 12 person hours, or 12 people for one hour, or a combination

Using other methods to indicate change, Cordell and Hendee (op. cit.) report the following sporting goods sales between 1979 and 1980: Backpack sales up 11%, tent sales up 20%, sleeping bags down 30%, and hiking boots down 10%. The last two categories may reflect a technological change with synthetic sleeping bags replacing the more expensive down-filled bag. Likewise, cheaper, lighter tennis-shoe type of boots have begun to rapidly replace the heavier, more expensive leather boots. Nevertheless, any discussion of projections or emerging trends in recreation or outdoor adventure must take into account the social and economic factors impacting upon future participation.

INFLUENCING FACTORS

Like many facets of recreation, participation in outdoor adventure activities will be impacted upon by a variety of factors. Any emerging trend in recreation will be determined by two main considerations: the

contextual base of the activity and the ambient socio-economic variables. Contextual base refers to the physical, psycho/sociological, and cognitive requirements surrounding the activity. In the case of outdoor adventure recreation, many activities require a predisposition that is both psychologically and physically amenable to accepting risks in the recreational setting (Zuckerman, 1979). Other requirements include equipment or material, and a geographically acceptable setting such as a white-water river, or rock climbing site. To engage in many outdoor adventure activities requires a certain level of outdoor and/or technical skills, either being possessed by the recreator or made available through an instructor or guide.

Ambient socio-economic variables which could impact the outdoor adventure scene would include population considerations, such as age distribution, growth rates, mobility and distribution patterns, discretionary income, and composition. Other factors influencing supply/demand responses are: transportation/energy costs, inflation/interest rates, available time, employment patterns, political attitude, legislative restrictions, competing uses of resources, level of government spending, and amount of available outdoor adventure resources suitable for recreationalists. (see Table 5)¹

As can be seen from Table 5, the contextual base surrounding each outdoor adventure activity is affected in a number of ways. Major positive influences on outdoor adventure include: population growth, increases in discretionary time, increasingly flexible employment patterns, and an increasing number of organizations involved in outdoor adventure. Negative influences include: increasing age and changing composition of the population, rising transportation costs, decreasing levels of government spending, and decreasing amounts of available, suitable natural resources.

These and other developing influences have created a situation in which outdoor adventure could go either way; toward greater public involvement, or toward a lessening impact upon the society. To date, a number of organizations involved with outdoor adventure such as Outward Bound, have experienced changes in enrollment patterns. In response to these and other changes, several trends have emerged in outdoor adventure. These trends are discussed in the following section.

EMERGING TRENDS IN OUTDOOR ADVENTURE RECREATION

Individuals and organizations have responded to the aforementioned influences in a number of ways. A search for broader financial support through new audiences and funding sources has led to the development of shorter (3-9 days), intensive outdoor experiences specifically aimed at attracting the affluent but time-pressed professional or business person. Recent research (Ewert, 1982; Thomas, 1985) has suggested that if shorter courses are to become the norm, a redirection of program goals may be necessary. For example, as listed in Table 1, the improvement of self-concept

1

See Cordell and Hendee (1982).

Table 5.--Selected Factors Influencing the Supply and Demand of Outdoor Adventure Recreational Opportunities, 1984-2000.

Social Economic Variable	Trend of Variable	Effect on Contextual Base Surrounding Activity			Net Effect
		Individual Predisposition & Motivation	Acceptable Setting	Equipment Material	
Population:					
Growth	↑	++	-	o	+
Age	↑	--	o	o	--
Distribution	South/West	+	++	o	+++
Discretionary Income		+	o	+	++
Composition	↑ Minority Represent.	-	o	-	--
Transportation Energy Costs	↑	--	-	-	----
Inflation/Int. Rates	↔ / ↑	+	o	+	++
Discretionary Time	↑	++	o	o	++
Employment Patterns	More Flexible	++	+	o	+++
Political Attitude of Public	Conserv./Assertive	-	-	o	--
Legis. Restrictions on Users	↑	-	+	-	-
Competing Uses of Resources	↑	-	-	o	--
Level of Gov't. Spending	↓	-	--	o	---
Amount of available resources	↓	-	--	o	---
# of organizations in outdoor adventure	↑	+	+	++	++++
Technology	↑	++	o	++	++++
Overall Effect		12+	5+	6+	21+
		10-	8-	3-	19-

Notes: ↑ = increase, ↓ = decrease, ↔ = stable, + = positive, - = negative

is an often cited benefit of participation in outdoor adventure. As suggested by Ewert, (1982) and Thomas, (1985), the shortened course format (three to nine days versus two to five weeks) may be less effective in creating a positive change in self-concept. Likewise, the professional adult-aged participant may be less able or willing to change their self-concept (Ewert, 1982).

Other populations which are receiving increasing attention are juniors (14 - 17 years old), women, youth at risk (a.k.a. juvenile delinquents) and senior-aged adults (aged 50 and above). Many of the outdoor adventure programs are becoming prescriptive, in that, they are specifically designed for a particular population's abilities and needs. Much of the research conducted to date has indicated that outdoor adventure activities can beneficially affect the participant (Meier, et. al., 1980; Ewert, 1983). Other populations which will receive wide attention from outdoor adventure programs in the future will be the physically and/or mentally handicapped and the chemically dependent. A number of recent studies (Arthur, 1976; Black, 1983) have indicated that participation in outdoor adventure programs can be rehabilitative.

To coincide with the developing educational trend of lifelong learning (Rillo, 1984: 15), an increasing number of colleges, universities, and high schools will be offering credit for participation in outdoor adventure programs. Other concurrent themes will be cross-cultural adventure courses, outdoor instructor centers, and organizations which specifically cater toward outdoor adventure workshops.

In addressing the problem of providing adventure in urbanized settings, the high adventure course (a.k.a. ropes course) will become a widely used method. Being defined as an obstacle course of cables, ropes, swings, logs, and nets, and constructed in trees, rafters, or pre-arranged planted telephone poles ((McBride, 1984:16), the high adventure course will become a primary focus in many programs (Webster, 1978; McAvoy, 1980).

Other emerging trends would include: a greater structuring and formalization of the entire outdoor adventure scene such as: greater programming, sophisticated marketing, risk management, diversification, and more intensive program evaluation. Market saturation will eventually lead to a substantial failure-rate, but with the survival of many larger organizations better able to exploit and develop existing or new markets. Organizations such as the Boy Scouts, Outward Bound, Project Adventure, and the National Outdoor Leadership School will continue to be widely emulated in both their models and programs. Many organizations will seek to broaden their financial base by external grants, incorporating successful business operations into their financial picture and emphasizing high profit operations such as junior's courses or exotic culture programs.

DISCUSSION

The supply and demand of outdoor adventure recreational opportunities will reflect a variety of external and internal forces. A growing, more urbanized, mobile, and affluent population will create a greater demand for outdoor adventure. Inhibiting this demand will be increases in transportation costs and competing interests for a decreasing supply of

available resources. In sum, it appears that by the year 2000, demand for outdoor adventure opportunities, as they currently exist, will exceed the supply of natural resources, i.e. geographical locations needed to provide those opportunities. This demand will be met in other ways: local man-made obstacle courses and human versus human in a natural setting, such as the currently in-vogue Survival Game, where the goal is to capture the opponent's flag with each person having a dye pellet gun. Outdoor adventure activities will become internalized into a program of life-long learning in different cultures and pedagogic settings. From the traditional outdoor adventure perspective, as perhaps the fur-trapper may have said as the American West became populated, "It might not be better but it sure will be different."

LITERATURE CITED

- Arthur, M. 1976. The survival experience as therapy: an appraisal. Journal of Leisurability. 3:3-10.
- Black, B. 1983. The effect of an outdoor experiential adventure program on the development of dynamic balance and spatial veering for the visually impaired adolescent. Therapeutic Recreation Journal. 17(3):39-49.
- Brady, M. and L. Skjemstad. 1974. Ski Cross-Country. New York: Dial Press. p. 206.
- Cordell, H.K. and J. Hendee. 1982. Renewable resources recreation in the United States: supply, demand, and critical policy issues. Washington, D.C.: American Forestry Association.
- Cordell, H.K. and L. Hartmann. 1983. "Aggregate trends in outdoor recreation in the two decades since ORRRC." Paper presented at the Southeastern Recreation Researcher's Conference. February 17-18. Asheville, NC. pp. 5-6.
- Darst and Armstrong. 1980. Outdoor Adventure Activities for School and Recreation Programs. Minneapolis: Burgess Publishing Company.
- Dunn, D. and J. Gulbis. 1976. The risk revolution. Parks and Recreation. August. p. 12.
- Ewert, A. 1982. A study of the effects of participation in an Outward Bound short course upon the reported self-concepts of selected participants. Ph.D. dissertation. Eugene, Oregon. University of Oregon.
- Ewert, A. 1984. Outdoor Adventure and Self-Concept: A Research Analysis. Eugene, Oregon: Center of Leisure Studies, University of Oregon.
- Hale, A. 1978. Directory: Programs in Outdoor Adventure Activities. Mankato, Minnesota: Outdoor Experiences.

- Helms, M. 1984. Factors affecting evaluations of risk and hazards in mountaineering. Journal of Experiential Education. 7(3):22-24.
- Kelly, J.R. 1982. Leisure. Englewood Cliffs, NJ: Prentice Hall.
- McAvoy, L. The experiential components of a high adventure program. In High Adventure Outdoor Pursuits: Organization and Leadership. Meier, J., T. Morash, and G. Welton, (eds.). Salt Lake City, Utah: Brighton Publishing Company: 116-123.
- McBride, D. 1984. The behaviors of adolescent boys in a residential treatment center during high ropes course experience. Ph.D. dissertation. Columbus, Ohio. The Ohio State University.
- Meier, J., T. Morash, and G. Welton. 1980. High Adventure Outdoor Pursuits: Organization and Leadership. Salt Lake City, Utah: Brighton Publishing Company.
- Rillo, T. 1984. Megatrends in outdoor education: past, present, and future. Journal of Outdoor Education. p. 18.
- Thomas, S. 1985. The effect of course length on self-concept changes in participants of the Minnesota Outward Bound School junior program. Ph.D. dissertation. Buffalo, New York: State University of New York at Buffalo.
- Webster, S. 1978. Project adventure: a trip into the unknown. Journal of Physical Education and Recreation. 49(1): 39-43.
- Zuckerman, M. 1979. Sensation Seeking: Beyond The Optimal Level Of Arousal. Hillsdale, NJ: John Wiley and Sons.

User Analysis and Documentary Film as a Tool for Implementing Park Changes

J. M. Westphal, Assistant Professor
Texas Agricultural Experiment Station
Department of Recreation and Parks
Texas A&M University
College Station, TX 77801
(409) 845-5330

ABSTRACT

This paper focuses on the combination of techniques that are believed necessary to: 1) insure a comprehensive assessment of site characteristics and behavioral phenomena in a park area; 2) allow for an objective presentation of information relating to the site and its management; and 3) facilitate the dissemination of the information to the public for review and comment in time-efficient manner. The techniques involved both traditional forms of data gathering (e.g., site assessments, citizen surveys and interviews) and information dissemination (e.g., public information program, technical reports) as well as two less extensively used techniques for characterizing the nature and use of park areas (e.g., user analysis and documentary film). A discussion of the costs and benefits of these less conventional techniques in relation to a site renovation project is presented.

KEYWORDS: user analysis, documentary film, park planning, site design, site renovation.

INTRODUCTION

Public participation is a vital element in park planning and design. It provides a means for citizens to contribute their skills, expertise, and resources in developing and/or renovating park areas as well as providing an opportunity for voicing personal needs and/or community priorities relating to park projects (Kaplan, 1980; Gold, 1981).

Meaningful public participation, however, is a difficult task to achieve. Personal and professional constraints relating to time, energy, and knowledge often prevent many citizens, including key decision-makers, from effectively assessing park phenomena in their communities. To counteract these limitations, new avenues of data collection and presentation (Whyte, 1980; Gold, 1981; Rutledge, 1981; ASLA, 1982) are being sought to help non-professionals assimilate information on park conditions more efficiently. Such a situation would assist community

leaders and concerned citizens in decision-making processes affecting park design, management, and use in their areas.

In this study, user analysis and documentary film was used to assist citizen groups in understanding the behavioral context in which two beach park areas were being used. Since the techniques involved systematic and objective analyses of use at the parks, information presented to the citizens was scientifically verifiable. Such information was then used to suggest changes for the parks in terms of design and management.

METHODOLOGY

In most work relating to the rehabilitation of existing park areas, data to be gathered will focus on three major areas: 1) site analysis; 2) user analysis; and 3) management analysis. Each of these areas of information generally rely on several, time-tested, traditional approaches to data gathering (Gold, 1981; Christiansen, 1977; Rutledge, 1971). Many of these methods utilize secondary data sources. The accessibility of secondary data, along with the use of mail surveys, in recent years, has encouraged fewer on-site visits by planners and/or designers. Such a situation tends to encourage a poorer understanding of the behavioral context in which parks are used.

To address this shortcoming, we tested several non-conventional data gathering and information dissemination activities that required user-analysis and documentary film. The purpose was to assess the additional costs related to the activities and the benefits of the data gathered for redesign purposes. A review of the methodologies used to examine each of the information areas listed above serve as the focus of this paper.

Site analysis

Site layout. Traditional approaches to the development of a basemap for a site often involve the use of aerial photographs and USGS topographic maps (same scale). The most recent aerial photographs are overlain with tracing paper and major features (e.g., roads, park boundaries, vegetation, architectural structures) are recorded. Likewise, an overlay of topographic features is produced. Each overlay is then enlarged or reduced by photographic processes (or through the use of a pantograph) to reach the scale desired. The overlays are then combined to produce the basemap of the study area. The problem with aerial photographs and USGS topographic maps is that they quickly become outdated in intensely used or rapidly developing areas. Therefore, they must be field-verified through actual on site surveying to insure accurate basemap production.

The cost of professional surveying currently averages about \$400.00/acre; this includes topographic as well as structural characterization of the site. In our study, budgetary constraints required us to use a combination of recent aerial photographs, surveys and select field transect data to develop the basemap. Approximately, ten hours were used to develop the overlay of the aerial photograph; two hours to transfer USGS topographic survey data to the overlay; and ten hours to selectively run transects to verify the basemap data.

Once our basemap was developed, we used old aerial photographs, newspaper articles, and surveyor information to characterize the nature and extent of physical change occurring at each of the beach park areas over time. This helped citizens visualize how current conditions evolved at the sites, and what types of future changes could be expected. The collection and comparison of old aerial photographs, newspaper articles, and surveyors notes took approximately twenty hours to prepare and record on super 8mm film.

Total cost for this phase of data preparation included: twelve hours for traditional basemap development and thirty hours for non-conventional data verification, preparation, and documentation. The benefits derived (above and beyond traditional methods) included a field verified basemap; pictorial documentation of site changes over time; a historical overview of the human dimensions affecting, or affected by, physical changes in the sites (from news accounts).

Physical Inventory. Physical inventories of site conditions relating to facilities and use areas have traditionally involved on-site assessments. In this study, we did not deviate from this approach except to document site conditions on film whenever possible. The site inventories included assessments of the physical, functional, and aesthetic qualities of the parks; inventory work took approximately eight hours to complete. Two of those eight hours were used to photograph the facilities and use areas. Five additional hours were needed to incorporate the photographic materials into the documentary film.

Total cost for this phase of the site analysis: 6 hours for traditional physical inventory; 2 hours for photographing inventory subjects; 5 hours for preparing the film for documentary use. The benefits derived from the non-conventional data collection included: permanent records of the physical conditions of the sites on film; reference material to gauge assigned assessment values; film to illustrate some of the problems with the sites.

User analysis

Traditional park visitor assessments tend to employ questionnaires (both on-site or mail-delivered) to determine levels of use, patterns of use, and user profiles for select park areas. In this study, we administered an on-site survey to park visitors to assess these three areas of concern, but we also employed several other, non-conventional user analysis techniques to verify the survey information and to provide additional information on behavior that the survey could not provide.

The survey asked questions about frequency of use, group size and composition, overcrowding, and physical, social, or managerial problems with the site. The cost of the survey work was: 2¹/₂ hours survey preparation; 31 hours for pretest administration, coding, computer analysis and revision; 98 hours survey administration, coding, computer analysis, and interpretation; 10 hours table and figure preparation for reporting purposes.

This data was corroborated with data from: 1) time-lapse photography; 2) personal observation; 3) visitor mapping; and 4) traffic counts (automated and non-automated).

Time-lapse photography. Two Canon XL-S514 movie cameras were inconspicuously set at high points in each of the park sites; a three second interval was used to record major areas of use and overall patterns of movement. Results of the filming showed intense use of the park areas by motorized vehicles; areas of conflict between motorized and non-motorized beach users; levels and location of use relating to park structures or use areas (e.g., cabanas, picnic tables, boat ramps, parking lots and roads, beach areas, etc.). Where interesting use levels or behavioral patterns showed up in the film, additional filming (non-interval) or personal observations were used to further characterize the use and/or user group.

Additional cost of time-lapse photography (8 days filming; 10 hours/day) in man-hours was approximately six hours; most of the time was used to set-up and take down cameras and change film. However, over 20 hours was used to review the films, and another 20 hours was needed to edit and splice films for documentary film purposes.

Benefits derived from this activity: pictorial presentation of behavioral patterns and use levels that could be directly linked with site design and/or management problems; permanent record of use on film; corroboration and enhancement of information derived from the user survey and other data collection efforts.

Personal Observation and Mapping. These techniques recorded various aspects of user group composition and patterns of use in the park areas. Both methods provided data with greater detail than the time-lapse photography allowed and significantly more information on users than the survey provided. Personal observation was specifically used to: 1) characterize the occupants of vehicles entering and passing through various checkpoints in the parks; 2) identify the nature and location of social groups engaged in various activities while using the parks; and 3) characterize use of park facilities and length of stay by individual groups within the park.

The cost of personal observation and mapping is high in terms of man-hours because of the demand for continuity in the activity. We used four observers, ten hours/day, for six days to gather data on the visitor. This amounted to 240 hours of on-site observation work. Analysis and preparation of the data for filming or technical report purposes took an additional 30 hours; and observation training to insure the comparability of data among observers took 3 hours. Therefore, 273 additional hours were used in this phase of non-conventional data collection. The benefits, however, appear worth the effort for several reasons. The results brought survey, time-lapse photography, and traffic count data into context with actual on-site behavioral phenomena; it provided the basis for representation of levels of use, types of use, and social groups composition in a spatial context; and it identified facility and use area attractions and deficiencies due to the detail of the data collected.

Traffic Counts. We used automated highway traffic counters to characterize major and minor ingress and egress points at the park sites as well as use levels for various areas along park roads. This data was coupled with personal observation work that characterized occupants of motorized and non-motorized vehicles in the parks; their location and use of

park facilities; and areas of conflict. What the automated traffic counters provided in numbers of cars passing a checkpoint over time, personal observation filled in with qualitative data about the user. For example, we had recorder tapes that indicated over 300 cars passed an ingress point during a 15 minute interval; however, personal observation allowed us to determine how many people (adult and children) occupied those cars. Time-lapse photography enhanced the data further by allowing us to determine how many of those vehicles were repeat visitors--i.e., cruising the beach roads and not using other park facilities.

The man-hours of work involved in traffic-counting was approximately 45 hours (four counters, 15 minutes/day, 45 days). An additional two days of observation work was used in conjunction with the traffic tapes (4 people, 2 days, 8am-6pm). Twenty hours of data analysis and preparation for filming (and technical report) were required. Therefore, approximately 185 hours of work went into this phase of the study. Benefits derived included: diurnal, weekly, holiday/non-holiday levels of use for the two park areas; intensity of use by different user groups on a spatial basis within the parksites; permanent records of use levels for future comparisons; justification of site design and management modifications due to the scientific validity and reliability of the data.

Management analysis

For this aspect of site rehabilitation, we used the traditional methods of park user surveys, personal interviews (park staff, public officials, community representatives), and public meetings. All of the data produced by these means were analyzed by computer and developed into charts or tables for reporting purposes (including filming).

Total man-hours consumed in this phase can be assessed as follows: park user surveys (already accounted for), personal interviews (10 hours preparation, 100 hours administration to approximately 80 individuals), public meetings (2 meetings, 2 hours/meeting). Data analysis and preparation included: 40 hours for computer coding and analysis; 20 hours for report preparation. Therefore, approximately, 154 hours were used for conventional data gathering analysis and preparation.

SUMMARY

Table 1 provides a summary of man-hours spent on both the traditional and non-conventional data collecting and preparation efforts used in this park rehabilitation 'study'.¹ From the summary, it appears that considerable costs are incurred with the incorporation of additional non-conventional techniques into the park study. Over 600 additional man-hours of work can be expected in a study using all of the data gathering techniques listed. This can amount to significant increases in project costs relating to salaries, travel, and other expenses.

1. It is important to note that these hours represent only on-site data collection, laboratory analysis, and data preparation of results. No travel or correspondence time is included in these figures.

However, if one examines the benefits derived from the expanded study effort--particularly in terms of permanent records on behavior, physical site conditions, and user groups--then the added expense may be justified. Furthermore, after study costs in man-hours required to read and assimilate information from a technical report is considerably higher (on a person-by-person basis) when compared to time required to observe a documentary film.² Therefore, in terms of information dissemination, we felt that the documentary film was more efficient in conveying information about the park sites. We further suspect, although all of our data collection efforts are not complete, that the film also conveyed the information more effectively for several reasons: 1) its shorter time span provided fewer opportunities for distraction; and 2) the impact of visual media appears to have greater power than the written word. From audience response after presenting the film versus presenting the technical report, we felt that the technical information contained therein was more easily conveyed, more completely presented, and less subject to misinterpretation to those reviewing the film. Further analysis of survey information and tapes taken of the audiences, and used to evaluate these two forms of information dissemination, will clarify these observations further.

2. The technical report was 70 pages long, not including tables and figures; the documentary film, which included the same results as the technical report, took 22 minutes to air.

BIBLIOGRAPHY

- American Society of Landscape Architects. 1982. User Analysis: An Approach to Park Planning and Management. Washington, DC.
- Christiansen, M. 1978. Park Planning Handbook. John Wiley and Sons, NY.
- Gold, S. 1981. Meeting the new recreation planning approach. Parks and Recreation(May): 53-82.
- Gold, S. 1980. Recreation Planning and Design. McGraw-Hill Publishing Co., NY.
- Kaplan, R. 1980. Citizen participation in the design and evaluation of a park. Environment and Behavior12(4): 116-132.
- Rutledge, A.J. 1981. A Visual Approach to Park Design. Garland STPM Press, NY.
- Rutledge, A.J. 1971. An Anatomy of a Park. McGraw-Hill Publishing Co., NY.
- Whyte, W. 1980. The Social Life of Small Urban Spaces. The Conservation Foundation, Washington, DC.

Table 1: A summary of man-hours used to complete various data gathering and information preparation tasks relating to a park rehabilitation project.

Methodology	Hours
<u>Traditional Data Gathering Efforts:</u>	154 hours
Management analysis (surveys, interviews, public meetings)	
Site Analysis	
(Physical inventories)	6 hours
(Basemap development)	12 hours
User Analysis	
(Visitor survey)	179 hours
Technical Report Preparation	60 hours
	411 hours
<u>Non-conventional Data Gathering and Information Dissemination Efforts:</u>	
Management analysis (film preparation)	20 hours
User Analysis	
(Traffic Counts and observation)	185 hours
(Personal observation)	273 hours
(Time-lapse photography)	46 hours
Site Analysis	
(Physical inventory filming and data preparation)	7 hours
(Basemap verification-transects)	10 hours
(Historical overview of change)	20 hours
Documentary film preparation	60 hours
	621 hours

FITNESS AS A LIFE STYLE: THE TREND TOWARD COMMITMENT

Barbara M. Cordell

Abstract.--American social and outdoor recreation changes since the 1950's are explored. The trend toward fitness as an outdoor recreation activity goal and as a basis for lifestyle is discussed. A model of commitment is proposed to partially explain the fitness trend as a positive leisure strategy for individual and social change in the 1980's.

Additional keywords: Outdoor recreation, physical fitness, social change, recreation benefits.

INTRODUCTION

The American society experienced a pendulum swing, from what pollster Daniel Yankelovich (1981) called the "self denial" ethic of the 1950's and pre-1950's, to a "duty-to-self" ethic in the 1960's and 1970's. This changing social world was the result of political, economic, technological, and scientific changes, including events such as the Vietnam experience, the environmental movement, women's liberation, technological advances, emerging global inter-dependence, and economic instability. One manifestation of these changes was lifestyle experiments in "self fulfillment"--searches for self-actualization that created a different social world than that of the immediate post-World War II era (Yankelovich 1981; Ferguson 1980).

In the 1980's, however, the pendulum seems to have begun a second movement toward the middle, allowing integration of the extremes of the "self denial" and "self fulfillment" social attitudes that dominated the past three decades. The result seems to be a growing social awareness that neither "self denial" or "duty-to-self" will bring total fulfillment to the individual or to society. Rather, an "ethic of commitment" may be emerging as an alternative. This possibility is described by Yankelovich as a "new cultural revolution (Yankelovich 1981)." Says Yankelovich, "The success of this new cultural revolution hinges on how successfully the seekers of self fulfillment can....now discard the most harmful and obsolete features of their life experiments and simultaneously encourage the healthy and adaptive features to come to the fore."

Therefore, alternative social strategies will emerge as prevalent social philosophies cease to meet widespread individual and social needs. One strategy for self-fulfillment is manifested in the recreation and leisure behavior of individuals.

One such leisure strategy may be the growing national focus on fitness and health. A commitment to fitness incorporates the positive aspects of the search for self fulfillment. It allows personal choice, challenge, and

control that is consistent with societal structure and stability. Fitness is encouraged and supported through a growing health consciousness fostered by the mental and physical health and parks and recreation professional communities.

There seems to be an emerging national trend toward awareness and commitment to fitness, that is providing individuals the personal and social feedback necessary for "healthy and adaptive" self fulfillment. This paper hypothesizes that the "fitness trend" manifests itself in U.S. outdoor recreation participation behavior and trends and as such has important implications for planning and future policies. A model of commitment to fitness is proposed to stimulate further research and thinking toward developing better understanding of this important social phenomena.

In this paper I traced the social changes underlying an apparent trend toward greater individual commitment, and I examined recent trends or manifestations of fitness activities in outdoor recreation. Next, the components of the commitment to fitness were explored and related to the apparent trend toward fitness as an emerging American life style.

The scope of this review was limited to recreation activities that require aerobic conditioning and are pursued in an outdoor setting. Examples include walking, swimming, bicycling, cross-country skiing, and jogging. While available data do not categorize fitness activities in this manner, a commitment to fitness would suggest regular and frequent participation, at least once per week, and for at least 30 minutes per occasion.

BACKGROUND OF SOCIAL CHANGE

A number of social changes over the past three decades are apparent. The emergence of minorities and women in the workplace; the restructuring of the family unit to include unmarrieds, childless families, single parents, shared families, and others; the "adultification" of teenagers (Elkind 1984); career experiments, such as early retirement and mid-life career change; the profusion of media impact on daily life, with an emphasis on youth and beauty, and with violence and sex on the home TV screen; more education for women and minorities; and an acceptance of the impossible as commonplace in science and technology. Not only these changes in themselves, but an accelerated rate of change is creating new pressures, even stresses, on society. In a society welcoming more options, new leisure strategies must be developed to meet the challenges of the opportunity and stress brought about by exploding technology and change.

In the past three decades, American response to this opportunity and stress has been both positive and negative. On the positive side, lifestyles were enhanced by greater freedoms, more economic and social opportunity for advancement, and the availability of lifestyle conveniences that provided

more free time for leisure pursuits. On the negative side, a recognizable social structure had been rearranged, and in compensation, an "anything-goes" philosophy emerged which can undermine secure social development in children and teenagers (Elkind 1984).

Individuals tend to seek security in a stable social system, and it is this social phenomenon that Yankelovich describes as the possible "new cultural revolution."

In place of the philosophy of self-denial prevalent in the 1950's, in which lifestyles were shaped by sacrificing for others; and in place of the "get in touch with yourself" philosophy of the 1960's and 1970's, which placed individual expression and actualization above all others; is perhaps the philosophy of commitment, suggested by Yankelovich. This philosophy incorporates parts of both past ethics. It allows individual choice and expression, but with a welcomed and recognized interdependence on and responsibility to others (Yankelovich 1981, Ferguson 1980, Naisbitt 1984).

The components of commitment to outdoor fitness may partially meet the needs suggested by self fulfillment strategies: a welcomed challenge to achieve goals of one's own choosing, to discover one's limits and potentials, and to learn and adapt under changing environments.

The challenge of fitness is hypothesized as one such manifestation of recent social evolution. By incorporating the advances of technology, enhancing personal achievement, constructing a positive social image, and reducing the effects of stress, the trend toward fitness is an emerging American lifestyle that has a potential to partially replace the old social strategies as one positive expression of the ethic of commitment.

THE TREND TOWARD FITNESS

Various studies have been conducted in the area of sports participation and in outdoor recreation. Sponsors and methods have varied over the years, however, and the different studies are difficult to compare. Furthermore, definitions of "regular participation" have varied, often inflating estimates of the numbers of "committed" participants. Keeping these limitations in mind, trends in outdoor fitness activities are explored below.

In general, Americans have become more physically active in their leisure and in the out of doors over the past 20 years. The National Recreation Survey (NRS), conducted in 1982, described a rapid increase in participation of over 3 percent per year since 1960 in some activities requiring aerobic conditioning, such as walking, hiking, canoeing, and bicycling (Cordell and Hartmann 1984). A moderate increase was reported in swimming activity as well. The NRS data also show that "among the 9 most popular of the summer activities listed, walking for pleasure showed the strongest growth, up 96 percent. It is very likely that some of the growth in this

activity occurred because it is physically oriented. Further attesting to the physical fitness orientation of our contemporary society, almost 19 percent of the 1982 survey respondents reported that they participated in jogging (Cordell and Hartmann 1984)." This figure, however, may not reflect regular or frequent participation in jogging. The Gallup Poll (1980) and the Miller Lite Survey of Sports Participation (1983) both reported 12 percent participation in jogging daily or almost daily. In addition, both the Gallup and Miller polls reported that almost half (44-46%) of the Americans surveyed said that they are involved in exercise either almost daily or on a regular basis. The Gallup Poll reported an increase in regular exercisers from 24% in 1961 to 46 percent in 1980. Even considering that these data may be inflated, increase in interest in fitness type activities is obvious.

Runner's World magazine recently published a report stating that the numbers of "serious" runners have been inflated by other reports. Based on counting only those runners who run more than 10 miles per week, at least once per week, Runner's World reports 4,365,000, or about 2.5 percent of the total U.S. population. However, they report that 12,178,000 adults run once a month or more. We may conclude from this analysis that the vast majority of Americans are not committed to jogging, but that about 6 percent jog, perhaps infrequently, but regularly.

A recent article compared the fitness data from a number of national polls. The authors reported a variance of 36 to 59 percent in reported regular exercisers (Lupton et al. 1984). The 36 percent figure reflects those individuals who say they participate in a planned activity several times a week. The authors also rank ordered activities by participation levels within each survey and found that the most popular activities, in order of preference, were walking, swimming, bicycling, bowling, calisthenics, hiking, softball, basketball, jogging, and tennis. Of these 10 most favored activities, 8 require some measure of aerobic conditioning, and 7 are most likely done in an outdoor setting.

What these data seem to suggest is that the fitness boom may not be as all-encompassing as it had first appeared. They do, however, suggest two trends in fitness oriented leisure. First, the trend in fitness seems to be in part related to the outdoor setting, as evidenced in the faster rate of growth of outdoor physically demanding activities as compared to sedentary outdoor activities (Cordell and Hartmann 1984). Second, the trend seems to be toward those outdoor activities that require commitment for successful participation, such as aerobic fitness activities, as opposed to the less physically demanding activities. A good example is boating, which increased 11.5 percent between 1960 and 1982 compared to canoeing, which increased 339.5 percent during that same period (Cordell and Hartmann 1984).

Thus, it appears that a small but rising proportion of the American population has become committed to outdoor dependent fitness activities. Although the reasons for this commitment are undoubtedly health related, other personal and social benefits probably influence the choice of activity, the frequency of participation, the social grouping, the intensity of commitment, and others.

BENEFITS OF FITNESS PARTICIPATION

Interest in the benefits of participation in fitness and leisure activities is evident in the literature. The fields of recreation, psychology, sociology, and medicine have involved research in the physical and psychological benefits of participation (Folkins and Sime 1981). In general, medical studies have documented the positive physical attributes related to fitness, particularly in terms of cardiovascular fitness (Newsweek 8-6-84). Although he pointed out the limitations of the research, Heaps (1978) conceded that psychological studies relating physical and psychological functioning "have generally found that as physical fitness increases, depression, anxiety, and self-centeredness decrease, and self-satisfaction and social adjustment increase." Folkins and Sime (1981) conducted an exhaustive review of the literature relating physical fitness and psychological functioning. While critical of the research designs employed, they were optimistic about the positive relationship suggested by the results. In particular, fitness training was found positively associated with improvement in mood, with reduced absenteeism at work (Athletic Business 1984), and with improved self concept (Hilyer and Mitchell 1979).

The leisure literature has entertained other important aspects of the fitness experience. For example, Iso-Ahollo and Weissinger (1984) discussed the topic of leisure and well-being. They pointed out that individuals with positive attitudes toward challenge, commitment, and control remained healthier than others.

A common element in much of the outdoor recreation literature seems to be based on Bryan's framework of specialization. Bryan proposed that "fishermen tend to become more specialized over time," and that specialization implied a shift from consumptive attitudes toward preservationist attitudes towards the resource, with more attention drawn to the setting and experience (Bryan 1977). Kauffman and Graefe (1984) examined specialization among canoeists and found that the greatest differences between specialists and non-specialists were in the rewards of achievement, exercise, and equipment testing. Because fitness requires a commitment of time, those committed to a particular fitness activity must also be specialists to some degree. If, as Kauffman and Graefe suggested, there is a commonality in the opportunities sought by different activity specialists, then fitness specialists may also be less consumptive (perhaps less competitive) over time, may value the reward of achievement and exercise, and may become more sophisticated with their equipment.

Schreyer, et al. (1984) examined the influence of past experience on behavior in an outdoor setting. They reported that those who are most experienced in running a particular river (veterans) were also more concerned with strengthening feelings of self worth, skills and abilities, and with thinking about personal values. Those less experienced users were more concerned with viewing scenery and nature, being away from crowds and being with friends, and wanted to experience something new. This finding seems to suggest that

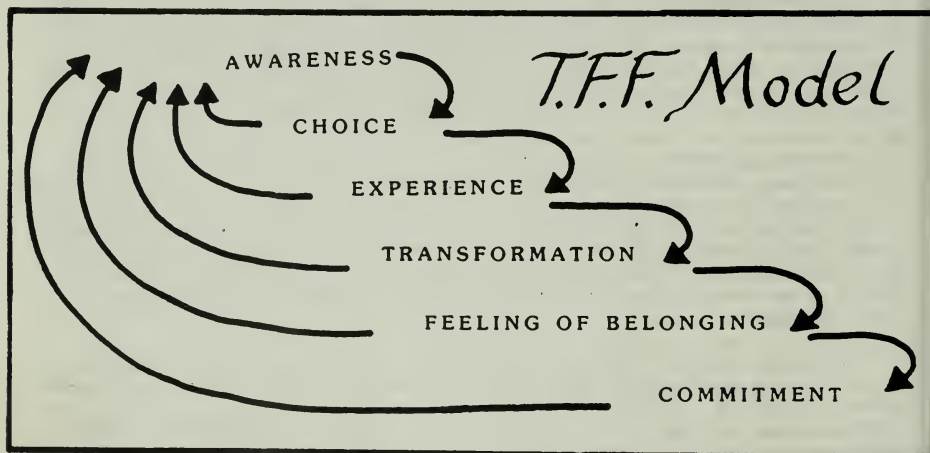
the veteran user is more reflective (i.e., less consumptive) during the experience, and participates more for the personal challenge than for the social rewards.

In sum, this literature indicates that the more specialized and experienced user, that is, the more committed participant, moves through a continuum of cognitive experiences, each providing greater personal awareness and rewards.

THE TFF MODEL

Total fitness (physical, mental, and emotional) seems to be a hoped-for reward of many committed leisure participants. It appears that physical fitness involves much more than the physical aspect, even if physical health was the impetus for initial involvement. A model is proposed to describe the process of commitment to a fitness activity, and will be described for the outdoor fitness participant. Coined TFF for total fitness feedback, the model integrates the social and outdoor recreation changes evident in the past three decades (figure 1). At least for a small portion of the American population, TFF may explain the trend toward commitment to fitness as a "healthy and adaptive" strategy for self fulfillment.

Figure 1. Hypothesized Total Fitness Feedback model of commitment.



Fitness requires a commitment of time. If the individual committed to outdoor fitness acquires the characteristics of the outdoor specialist, then they should experience a dynamic state of change, becoming more aware of personal challenges and rewards, and with a greater sensitivity to the environment. As the individual continues to participate in the activity, the benefits of experience become more holistic. Rachel Kaplan described a similar experience in wilderness users: "There is a simplicity in demand on oneself and on each other, a simplicity of purpose. The various aspects of simplicity seem to be related to a sense of wholeness, of oneness, and this, in turn, encourages a positive view of life and situation. Life seems less hasty, and one's psychological energy can be channeled in ways that are in tune with the demands of the environment (Kaplan 1984)."

It is hypothesized that only at this holistic level of fitness is long term commitment to a fitness life style likely to occur. The commitment is possible as the individual experiences more intrinsically rewarding types of feedback. As with Bryan's specialists, and Schreyer et al.'s veterans, TFF describes a cyclical movement toward greater awareness and appreciation of oneself and of one's environment.

The TFF model describes a cyclical process. The option to abandon is available at all times, but becomes less likely as each subsequent experience is realized. Awareness, the first step, is the basis for all movement through the model. Initial awareness most likely occurs at a social level, or at least is based on the desire for positive social feedback. Examples include a desire to lose weight, peer pressure to join a club, or awareness of a health problem. Today's social signals strongly support the health and fitness concept, through the media, the market, and peer influence. A choice is made, either to ignore the signals or to pursue a resolution to the crisis evoked by awareness. Experience involving the actuality of effort follows choice. Experience is the activity participation. Examples are jogging, tennis, swimming, or walking. Awareness of the effort and its consequences permit exit or the choice to continue. Continuity results if the individual or social feedback is sufficiently satisfying. At some point during the experiential step, a shift from a primary desire for social feedback to a primary desire for personal or intrinsic feedback is recognized. At this level of awareness, the experience facilitates a transformation in the self-concept and motivations of the individual. The activity is pursued for the individual benefits accrued, such as reduced stress, enjoyment, physical health, and others. The role of satisfying experiences assumes more importance, gradually emerging as a focus in the individual's life. An awareness of this forming centrality, based on total fitness feedback (physical, mental, and emotional), along with a confidence stemming from continued experience, gives the individual a feeling of belonging at some level of community. For example, the individual sees himself as a "runner," a "tennis player," or as a "health-conscious" person. As experience and awareness continue, the focus of belonging may become more encompassing. When awareness includes belonging, the desire for social and intrinsic feedback are reconciled. At this point the individual is most likely to commit to the lifestyle responsible for this intrinsic satisfaction, which is based on positive physical, mental, and emotional feedback.

DISCUSSION

The search for self fulfillment is a personal experience, however, strong social feedback often helps direct its path. In the 1950's, social convention dictated a family-and-society-first lifestyle. These values often suppressed the needs of individuals for self expression and change. The 1960's and 1970's witnessed a reversal of this lifestyle, with American youth rebelling at every convention and espousing a lifestyle steeped in self expression and absent of sacrifice. As with most social movements, a middle ground is appearing. This ground is fertile for a social ethic that incorporates the positive aspects of the sacrifice and self beliefs. The trend toward fitness, in contrast to temporary fads, carries the strength to provide not only personal health and social approval, but the opportunity for the integration of individual and social achievement to the benefit of both. If total fitness does indeed meet important individual and social needs, the apparent trend toward commitment to fitness as a life style will probably continue into the 1980's and 1990's.

Outdoor recreation researchers and managers, then, should begin to examine the implications of a growing proportion of Americans demanding opportunities for total fitness in the traditional outdoor recreation setting. The traditional concept of outdoor recreation may need to be expanded within the philosophies and management plans of outdoor recreation, integrating the unique opportunities for total fitness in the natural setting with the rising demand for such experiences.

LITERATURE CITED

- Athletic Business. 1984. "New Fitness Data Verifies: Employees Who Exercise Are Also More Productive," December, pp. 24-30.
- Bryan, Hobson. 1977. "Leisure Value Systems and Recreational Specialization: The Case of Trout Fisherman, Journal of Leisure Research, 9(3): 174-187.
- Cordell, H. Ken and Lawrence A. Hartmann. 1984. "Trends in Outdoor Recreation in the Two Decades Since ORRRC," In Southeastern Recreation Research Conference Proceedings, April. 124 pp.
- Dishman, Rod K., William Ickes, and William P. Morgan. 1980. "Self Motivation and Adherence to Habitual Physical Activity," Journal of Applied Social Psychology, 10, 2, pp. 115-132.
- Elkind, David. 1984. All Grown Up and No Place To Go: Teenagers in Crisis. Reading, Massachusetts: Addison-Wesley Publishing Co. 232 pp.
- Ferguson, Marilyn. 1980. The Aquarian Conspiracy: Personal and Social Transformation in the 1980's. Los Angeles: Tarcher, Houghton Mifflin Company. 448 pp.

- Folkins, Carlyle H. and Wesley E. Sime. 1981. "Physical Fitness Training and Mental Health," American Psychologist, April, Vol. 36, No. 4, pp. 373-389.
- Gallup Opinion Index. 1980. "Leisure Activities," Report No. 178, Princeton, N.J., June, pp. 24-28.
- Heaps, Richard A. 1978. "Relating Physical and Psychological Fitness: a Psychological Point of View," Journal of Sports Medicine, 18, pp. 399-408.
- Hilyer, J. and Mitchell, W. 1979. "Effect of Systematic Physical Fitness Training Combined With Counseling on the Self Concept of College Students." Journal of Counseling Psychology, 26, pp. 427-436.
- Iso-Ahollo, Seppo E. and Ellen Weissinger. 1984. "Leisure and Well-Being: Is There a Connection?" Parks and Recreation, June, pp. 40-44.
- Kaplan, Rachel. 1984. "Wilderness Perception and Psychological Benefits: An Analysis of a Continuing Program," Leisure Sciences, Vol. 6, No. 3, pp. 271-290.
- Kauffman, Robert B. and Alan Graefe. 1984. "Specialization, Expected Rewards and Resource Related Attitudes Among Canoeists" paper presented at the 1984 National Recreation and Park Association Leisure Research Symposium, Orlando, Florida.
- Lupton, Charles H. III, Nancy M. Ostrove and Robert M. Bozzo. 1984. "Participation in Leisure-Time Physical Activity: A Comparison of the Existing Data," Journal of Physical Education, Recreation, and Dance, November-December, pp. 19-23.
- Miller Brewing Company. 1983. The Miller Lite Report on American Attitudes Toward Sports, Milwaukee, Wisconsin. 218 pp.
- Naisbitt, John. 1984. Megatrends: Ten New Directions Transforming Our Lives. New York, New York: Warner Books, Inc. 333 pp.
- Newsweek, 1984. "Keeping Fit for Life," August 6, pp. 63-64.
- Runner's World. 1984. "Who is the American Runner?" Runner's World, August. pp. 46-57.
- Schreyer, Richard, David W. Lime, and Daniel R. Williams. 1984. "Characterizing the Influence of Past Experience on Recreation Behavior," Journal of Leisure Research, Vol. 16, No. 1, pp. 34-50.
- Yankelovich, Daniel. 1981. New Rules: Searching for Self-Fulfillment in a World Turned Upside Down. Random House, Inc., New York, New York: 280 pp.

OUTDOOR RECREATION FOR INDIVIDUALS WITH
HANDICAPPING CONDITIONS: PAST, PRESENT
AND FUTURE

Robert E. Cipriano, Ed.D.

Abstract

Outdoor Recreation, with its salient characteristics of participatory and experiential activities, holds great promise relative to meeting human growth and development needs of disabled people. Research indicates that the outdoors can be a positive contributor that can be used to enhance the lives of people with handicapping conditions.

Additional keywords:

Outdoor education, camping, environmental education, outdoor environment, disabled, handicapped.

REVIEW OF THE RELATED RESEARCH FINDINGS:

Although limited, existing research indicates that the outdoor environment can provide a fertile medium for the physical, emotional, intellectual, and social development of the disabled child (Havinghurst 1965; Lefebvre 1972; Holden 1960; Robb 1971; Balla, Butterfield, and Zigler 1974; Guthrie, Butler, and Gorlow 1963). The value of the outdoor environment as a therapeutic modality can also be inferred from studies that have identified the detrimental effects of isolation, hospitalization, and institutionalization and the positive effects of exploration, free play, and the outdoor environment.

Research has shown that physical and motor development of disabled children may be retarded by environmental conditions related to their disability such as institutionalization and the positive effects of exploration, free play, and the outdoor environment.

Research has shown that physical and motor development of disabled children may be retarded by environmental conditions related to their disability, such as institutionalization and isolation. Other research has shown that for some disability groups; physical and motor development can be enhanced by the provision of physically-based learning experiences in an outdoor environment (Drowatzky 1968, Oliver 1972, Rarick 1973).

The available research indicates that perceptual development is independent of intellectual development in the mentally handicapped and that haptic perceptual development is similar for blind and sighted children (Doyle 1967, Gottesman 1971). Since, in these skill areas, the mentally handicapped and the visually impaired can perform at approximately the same levels as their normal peers, it can be inferred that providing opportunities to develop these skills could give the disabled child successful experiences. It can be further theorized that these successes may be of value in enhancing self-attitudes and may have carry-over value in other areas as well. Further research is needed to substantiate these inferences.

Numerous studies of various dimensions of the self-concept of disabled children have been reported (American Camping Association 1972). It is generally accepted that the lower self-concepts found among disabled children are due primarily to environmental factors related to the disability, and that self-attitudes can be enhanced through programs in which the environment is manipulated so that children are able to perceive themselves in positive ways. Similarly, in other areas of personality and social development, research indicates that environmental manipulation can be of benefit to the disabled child (Lowry 1974, Robb 1971, Tait 1972).

The out-of-doors is in fact an environmental classroom in which the pathways to learning are many. Within this environment, each person is an individual with a genetic number, family, education, and personal values which forever set him or her apart from others. American education can contribute greatly to the kinds of environmental learning opportunities needed by disabled persons, but the traditional school environment has limitations due to its formal process and specific facility perspectives. THEREFORE, Outdoor RECREATION (not school based) can help fill the void for providing a wealth of experiences for individuals with handicapping conditions. The effect of the outdoor environment on intellectual, cognitive, and language development has been investigated. The results of these studies indicated that benefits have accrued to the mentally handicapped, the visually and hearing impaired and those with learning disabilities in improving communication and academic skills (Baer and Stanley 1969, Buell 1956).

A considerable amount of literature describing innovative ideas in programming and program administration, and a limited number of research studies have been published. However, the body of scientific knowledge about the planning, administration, and evaluation of programs for the disabled that use the outdoor environment contains many large, easily identifiable gaps.

Many environmentally oriented programs for disabled children have been implemented. Some, within public school systems, have helped mentally handicapped and learning disabled children to improve their academic skills and attitudes (Albert 1970, Brannan 1969). Others have been used to enhance the physical and social skills and self-attitudes of children with all kinds of disabilities. The activities in these programs have ranged from highly structured nature studies and traditional recreation to individualized environmental exploration.

In some sections of the country, environmental education programs for the disabled are being conducted in organized camps and in federal and state parks. Most camp programs described in the literature are at therapeutic camps and integrate therapeutic techniques into traditional camping activities (Vinton, et al., 1978).

In the parks, services have been expanded in recent years to include not only accessible outdoor facilities, but also expanded environmental education programs for the disabled.

Potential Impact of P.L. 94-142 and Section 504

P.L. 94-142, the Education for ALL Handicapped Children Act of 1975, mandates a free appropriate public education for all handicapped children in the least restrictive environment.

In terms of national educational policy, this act has been described as the most significant piece of legislation affecting the education of handicapped children and youth in the history of the United States. The signing in 1977 of Section 504 of the Rehabilitation Act of 1973 prohibits the disabled being a) excluded from, b) denied the benefits of, or c) discriminated against under any program or activity receiving Federal financial support. Section 504 may prove to be the most powerful legislation of all because it prohibits discrimination against America's disabled persons of all ages in terms of physical and program accessibility as a matter of civil rights. In general, the rights and protections guaranteed under P.L. 94-142 are also affirmed in Section 504. Of particular significance is that both laws guarantee that, to the greatest extent possible, disabled persons participate in programs and activities (i.e., school sponsored outdoor education programs) with their non-handicapped counterparts. Both laws mandate fuller, more normalized life experiences for disabled persons and are clear evidence of society's increased concern for the human and civil right of each individual (Brannan, 1981).

Full Educational Opportunity Goal (FEOG)

Under P.L. 94-142, the full educational opportunity goal (FEOG) requires, "the provision of additional facilities, personnel, and services for further enrichment of the disabled child's educational opportunities" beyond that mandated under the free appropriate public education (FAPE) requirement. This goal specifically refers to providing disabled students full educational opportunities in term of "program options" and non-academic services. Broader in scope than FAPE, the FEOG requirement under P.L. 94-142 is an all encompassing term which covers disabled "children" aged 0-21 years of age and stresses employing additional facilities, personnel, and programs to expand the student's total education. Thus, it focuses on improving the overall quality of education provided the disabled person. Two legislative requirements under FEOG, Program options and Non-academic services, are particularly important. Program options refer to ensuring that handicapped children have available to them the variety of educational programs and services available to non-disabled children in the area served by the agency, including art, music, industrial arts, consumer and homemaking education, and conventional education. It is important to note that the potential list of program options is extensive and could include any program or activity such as out-door education in which non-disabled students participate (Brannan 1981).

Also, many program options are, by their very nature, leisure oriented, and directed toward activities designed to enrich and complement the student's academic education. Noting the unique needs of many disabled students for instruction directly related to community adjustment, this aspect of the law is particularly significant in that it affords more realistic learning opportunities that have carry-over value in terms of leisure participation in home and community settings (Brannan 1981).

Also, many program options are, by their very nature, leisure oriented, and directed towards activities designed to enrich and complement the student's academic education. Noting the unique needs of many disabled students for instruction directly related to community adjustment, this aspect of the law is particularly significant in that it affords more realistic learning opportunities that have carry-over value in terms of leisure participation in home and community settings (Brannan 1981).

Non-academic services, a requirement similar in intent to Program options, is also addressed under the Full Opportunity Goal Section of the law. According to this requirement:

- a. each public agency shall take steps to provide non-academic and extra-curricular services and activities in such a manner as is necessary to afford handicapped children an opportunity for participation in those services and activities equal to that afforded non-handicapped children. Non-academic and extra-curricular services and activities may include counseling services, athletics, transportation, health services, recreational activities, special interest groups or clubs sponsored by the public agency.

Again, the intent of this requirement is to expand the quality of education provided disabled children by guaranteeing them equal opportunity for participation in a wide variety of learning experiences beyond the traditional school curriculum. Many of these learning experiences are also leisure oriented, moving learning experiences beyond the classroom walls to expand the student's total education. Outdoor education programs, community recreation programs, and hobby oriented clubs are only a few of the potential services and activities that further enrich the student's school program.

Needs of Handicapped Children

Disabled people have needs for wholesome and appropriate recreation and outdoor learning activities and experiences. Recreation and leisure make up some part of the life-style of virtually everyone in this country regardless of age, sex, profession, religion or ethnic background. Generally, most of us tend to view recreation as a positive pursuit. At the same time, however, there are variations in the priority which recreation has vis-a-vis other activities in our daily lives. Depending on the nature of other pressures, recreation may or may not be a major force in our lives - although an important element in any balanced existence.

It is widely believed that outdoor recreation experiences can assist disabled people to live with dignity, and to function as independently as possible. Participation in such activities can also accelerate the integration of disabled persons into the community, thereby reducing isolation and stigma. Further assumptions about outdoor recreation programs include (Brannan 1981):

1. The outdoors enables youngsters to participate in a "total" learning experience. Day-trip and residential outdoor education programs afford a fuller range of "true-life" learning opportunities not attainable in the typical school setting. During such experiences, students are able to employ self-help academic, physical, social, leisure and work skills in the same setting.

2. Outdoor education enables the school to extend, compliment and reinforce its current educational goals and objectives for disabled students. The natural environment provides opportunities to pursue learning related to all areas of the school's curriculum (i.e., math, reading, physical education) and to directly apply skills and concepts in order to solve daily life problems common to outdoor programming.
3. Generalization and transfer of learning are facilitated because students apply learnings to different settings under different conditions and have the added incentive to using their knowledge and skills to solve "real life" problems encountered in the outdoor setting.
4. The outdoors can help develop skills of lifetime usefulness (i.e., self-directed behavior, problem solving behavior, observation skills, inquisitiveness). Increased responsibility for caring for one's own needs promotes problem solving; the new environment and the highly stimulating effect of nature promotes inquisitiveness and independent observation of the surroundings.
5. Social development is increased through interdependence and interaction with peers and adults. Trust relationships with others are furthered; positive interpersonal relations are formed (child-child, child-teacher, teacher-child). Extensive opportunities for group participation (i.e., tenting, signing, eating, playing) foster social skills especially related to cooperativeness and friendships.
6. Self-concept development is facilitated through numerous success experiences. Opportunities for interaction with the natural environment are limitless and flexible according to the individual's interest and ability level.
7. The variety and highly stimulating effect of outdoor activities are incentives that motivate persons to emply independent and self-initiated behaviors in order to interact with their environment. It is especially important for many severely disabled students who often need increased motivation in order to try new experiences. Increased self-awareness is often a by-product of pursuing natural awareness.
8. Outdoor education offers innumerable opportunities for employing a complete sensory approach (i.e., tactual, olfactory) when investigating and learning about one's environment. Multi-sensory experiences are critically important for many students who are experientially deprived because of their communication problems. Opportunities abound for tactile-kinesthetic learning.
9. The outdoors is inherently motivating and therapeutic because of the fun and adventure associated with experiencing the natural environment. Actual contact with the natural environment (i.e., trees, rocks, streams, lakes, beach, wind, mountains, deserts, animals) is always new, refreshing and exhilarating.

10. Exposure to the outdoors captures children's inherent interest in nature and provides the logical setting for developing awareness, sensitivity and appreciation of their natural environment. Taking time as part of an outdoor experience to discover and observe the beauty of the natural surrounding is an important objective and a "natural" time to stress and practice conservation measures.
11. Youngsters are able to "open up" and express their individual selves through the more informal and relaxed atmosphere unique to the outdoors. Such an atmosphere brings persons "closer together", promotes increased feelings of respect and acceptance and enhances future relationships in the school setting. The added opportunities for personal interactions in the outdoor environment between teachers and children usually generalize back to the classroom in the form of new friendships among students, more compatible working relationships (child-child, teacher-child, child-teacher) and new understanding of the individual's interests, potentials and worth as a human being.
12. Outdoor education enables disabled youngsters to participate in a variety of activities and settings that have important potential for recreation and leisure (i.e., camping, games, swimming, hiking, historical sites, fishing). A significant outcome of most outdoor education programs is that youngster also gain new knowledge, skills and interest that will enable them to make more constructive use of their leisure time.

Outdoor learning is a necessary part of human development in that it enables individuals to explore and develop to their full potential. This goal is especially important to disabled individuals and, therefore, recreation and outdoor learning experiences should be included in the range of programs available to such persons. It can be argued that, in some instances, the provision of recreation and outdoor learning services is even more important to persons with disabling conditions since many are confronted with enforced leisure, either as a result of their disability or continuing discrimination in the job market and other sectors of society.

The current state-of-the-art in outdoor pursuits for disabled individuals, though still inadequate, is improving. Over the past few years, an increasing effort has been made to call attention to the need for and importance of outdoor learning opportunities for disabled persons. For example:

- a. the number of articles describing new techniques in recreation services which appear in professional journals and newsletter is growing; books monographs and other materials on the subject;
- b. information systems and materials centers such as Therapeutic Recreation Information Center (TRIC), and the Physical Education and Recreation for the Handicapped: Information and Research Utilization Center (IRUC) have been established to provide information and materials regarding recreation services;

- c. special programs at professional conferences, conventions, and meetings provide a means to share information about outdoor programs, needs and problems; and
- d. results of research and demonstration projects funded by the Office of Special Education are being disseminated and utilized on an increasing basis.

Innovative and creative programs are being conducted in many places. However, if one looks at the total scope of opportunities for all disabled persons, it must be concluded that too few disabled persons are currently being served by such programs. Too many programs suffer from inadequate funding and insufficiently trained leadership. Many programs still operate on a separate or segregated basis which tends to perpetuate the concept that disabled people are different and unable to participate in the "mainstream" of community life. Additionally, disabled persons are rarely involved at decision and policy making levels regarding recreation and outdoor learning programs and activities. It is also unclear to what extent disabled persons participate in informal, less organized activities as opposed to more formal, structured and highly organized programs sponsored by public and private organizations.

FUTURE TRENDS

Education for the Twenty-First Century

How will society and the world change in the next twenty-five years? What will be the crucial issues? How will these societal changes and issues affect students and educational programming? Questions such as these were recently presented to an international panel of 135 scholars and scientists by Harold Shane, Director of Phi Delta Kappa Curriculum project which was funded by the Lilly Endowment. In attempting to answer these questions, panelists first described the world as they predict it to be in the next twenty-five years. Panelists agreed that a state of turmoil will exist as a result of the following factors: (1) competing values between those who think the environment should be exploited to provide human needs and those who feel that a balance should exist between man and his environment, (2) development of a new economic order characterized by improved management of the world economy, (3) world-wide inflation, (4) increased private and public debt, (5) increased unemployment, (6) energy deficits, (7) environmental pollution, (8) overpopulation resulting in increased problems with food distribution, (9) increased political tension as many small, underdeveloped nations are established, (10) increased threat from weaponry development, (11) greater tension and strain on democratic governments, and (12) increased "assault on human reason" by the media (23).

If these descriptions of the future are accurate, what concepts do people need in order to live in such a turbulent society? The panelists mentioned the following concepts as being most important. They include a need to develop: (1) survival concepts - conservation and recognition of the increased interdependence of individuals and their environment, (2) an understanding of the holistic quality of the environment, (3) awareness that individuals are environmental change agents, (4) an understanding of trade-offs, (e.g., trade-offs between environmental quality and energy demands), (5) a realization that society is global, yet mobile, (6) an understanding of the need for frugality, (7) an awareness of individual differences in learning, (8) an understanding of cultural differences in learning, (9) an understanding of cultural differences and the effects of cultural backgrounds on behavior, and (10) a realization that all

attitudes are learned. Individuals who acquire these concepts should have an understanding of their responsibility toward other individuals and the environment.

If these are the basic concepts which students need, what must schools do to ensure that students attain them? Shane suggests that the learning environment which includes the home, school and community should provide for the establishment of prioritized goals, (e.g., personal security in a turbulent society might be a priority); personalized education based on individual needs; an emphasis on "healthy" mental, emotional, and physical development; greater emphasis on subject matter mastery while maintaining student interest and motivation; development of observation and problem-solving skills; and greater awareness and appreciation for democratic principles through participation in group decision making processes. Shane also stresses the need for cooperative efforts between parents and teachers to improve the learning environment and to serve as role models.

With these societal trends and needed educational changes in mind, educators must determine which instructional approaches can be utilized to best meet learners' needs. As an interdisciplinary instructional process, outdoor education provides students with experiences in a learning environment which facilitates concept development. Through outdoor education, students acquire a better understanding of their relationship to others and a greater understanding of the natural environment. Therefore, outdoor education is an appropriate process for meeting educational needs of disabled and non-disabled students in the next twenty-five years. Yet, societal trends must be considered in order to maintain current outdoor programs and to develop new ones.

Economic Considerations

Economic factors such as increasing inflation, public and private debt, and energy costs play an important role in programmatic offerings. Residential programs are especially affected by greater costs for transportation, utilities, facility maintenance, food, equipment, insurance, and salaries. In addition, disabled people often require modification of facilities, special equipment, specially designed buses, and a higher ratio of trained personnel. As costs rise, school-site programs may become more feasible in providing special services. Even though costs increase, schools must still maintain appropriate facilities, equipment, and transportation for disabled students.

With increased personal economic burdens, citizens often pressure state and federal governments to decrease governmental spending and to cut taxes. The public also pressures politicians to reduce spending for social and education programs which they consider to be "frills." Even though research may support outdoor recreation, it is often considered to be one of those "frills", because experiences occur outside of the traditional areas. Also, many citizens feel that the excess cost of education programs for the disabled is unfair to "normal" students. Proposed federal and state budget proposals for education exhibit the result of these pressures. The trend seems to be to place more control for education in local school districts by not earmarking funds for particular educational programs and by reducing budgets for educational programs. Even with tightened budgets, many school districts maintain quality outdoor and special education programs; yet other districts reduce services.

Reduced educational funds from state and federal governments increase the need to seek other financial sources for maintaining outdoor education programs. Local financial sources may include private individuals and businesses, foundations, volunteer groups, and service clubs.

The economic trends also place pressure on educators, parents, park and resource management personnel and staff from other agencies to plan cooperatively and share resources. Shared resources may include facilities, transportation, equipment, and materials. Also personnel can share knowledge and skills, thus serving as consultants for each other. As educators and personnel of residential facilities pool resources, it may become more economically feasible to maintain some residential programs. However, support for non-residential outdoor programs that center on the school site and locations within a close proximity of schools and that are generally less expensive to operate may increase. These programs may be an alternative for school districts who no longer see residential programs as economically possible.

Impact on Parks and Recreation

The involvement of disabled individuals in schools and parks and recreation programs has increased, often as a result of state and federal legislation. As persons become more aware of the need for disabled individuals to develop skills in "normal" settings, the use of parks and recreation areas by the disabled should increase. Therefore, parks and recreation personnel must consider possible changes in several areas in order to provide appropriate services.

Physical access of facilities is an area of important consideration. Physical modifications to eliminate architectural barriers, such as stairs, narrow doorways, curbs and small restrooms, may be necessary. Section 504 of the Rehabilitation Act of 1973 requires that federally assisted programs be physically accessible. In removing architectural barriers, concerns may arise over preserving the authenticity of historical sites and wilderness areas.

Often accessible transportation is not available to transport disabled persons to parks and recreation areas. Cooperative efforts with parent groups, service organizations, and organizations for disabled may provide alternative solutions to this problem.

Programmatic access is another area of concern for parks and recreation personnel. Again, Section 504 requires that programs receiving federal assistance be accessible. However, programs, including activities, materials, and equipment should only be adapted to the extent necessary. The issue of segregated versus mainstreamed programs must also be considered with continuum of services provided.

The trend toward increased programming for the disabled results in increased administrative responsibility. First, it may be necessary for the administrator to develop a policy statement in support of programs for the disabled. Secondly, programs must be designed and monitored to ensure that programs and facilities are accessible. Thirdly, disabled persons should be employed. And finally, administrators must provide employees with appropriate inservice training.

Interagency cooperation is another major area of concern for parks and recreation personnel in providing services. By working with schools and other agencies which have developed outdoor programs for the disabled, ideas and resources can be shared in order to provide more effective programs and avoid duplication of services.

LITERATURE CITED

- (1) Brannan, Steve A., Project Director. Project EXPLORE Manual. Portland, OR: Portland State University, 1979.
- (2) Byers, E.S. "Wilderness Camping as a Therapy for Emotionally Disturbed Children: A Critical Review." Exceptional Children, 45:8:628-35, 1979.
- (3) Carlson, Reynold E., Julian Smith, George W. Donaldson, and Hugh B. Masters. Outdoor Education. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1972.
- (4) Cormany, Robert. "Outdoor Education for the Retarded Child." Education and Training of the Mentally Retarded, 9:2:66-69, 1974.
- (5) Donaldson, George W., and Malcolm D. Swan. Administration of Eco-Education. Washington, D.C.: Council on Outdoor Education, 1979.
- (6) Donaldson, George W., and Oswald Goering, eds. Perspectives on Outdoor Education. Dubuque, IA: William C. Brown Company Publishers, 1972.
- (7) Dustin, Daniel L., and David L. Daly. "A Therapeutic Camp for Communicatively Handicapped Youths." Therapeutic Recreation Journal, 12:24-29, 1978.
- (8) Folkerth, Jean E., and Barbara D. Pantzer. "Program Abstracts" Therapeutic Recreation Journal, 12:9-16, 1978.
- (9) Havighurst, Robert. "Camping Helps Youngsters with Developmental Tasks." Camping Magazine, 37:6:13-14, 1956.
- (10) Johnson, E.W., and R.T. Johnson. "Integrating Handicapped Students into the Mainstream." Exceptional Children, 47:2:90-98, 1980.
- (11) Keller, Diane W. "Outdoor Education for the Handicapped." Focus on Exceptional Children, 12:6:1-13, 1980.
- (12) Krieger, William. "Study on Self-Concept Change in Campers Receives ACA's 1972 Research Award." Camping Magazine, 45:5:16-17, 1973.

- (13) Kronick, Doreen. "Regular Camp, Special Camp or No Camp." Academic Therapy Quarterly, 4:3:207-11, Spring, 1969.
- (14) Lefebvre, Claudette. "The Comparative Effects of Three- and Six Week Periods of Residential Camping on Physical Fitness and Adaptive Behavior in Children and Youth with Brain Dysfunction Syndromes." Dissertation Abstracts International, 33:200-201,(1A), July, 1972.
- (15) Marini, Denise G. "Effects of Additional Physical and Recreational Curriculum on Selected Perceptual-Motor Abilities of Educable Mentally Retarded Children." Therapeutic Recreation Journal, 12:31-38, 1978.
- (16) Rawson, Harve E. "Short-Term Residential Therapeutic Camping for Behaviorally Disordered Children Aged 6-12: An Academic Remediation and Behavior Modification Approach." Therapeutic Recreation Journal, 12:17-23, 1978.
- (17) Sacks, Arthur B., and Craig B. Davis, eds. Current Issues V: The Yearbook of Environmental Education and Environmental Studies. Columbus, OH: ERIC Clearinghouse for Science, Mathematics and Environmental Education, 1979.
- (18) Sacks, Arthur B., Lei Lane Burrus-Bommel, Craig B. Davis, and Louis A. Lozzi. Current Issues VI: The Yearbook of Environmental Education and Environmental Studies. Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education, 1980.
- (19) Sessoms, Douglas H. "Organized Camping and Its Effects on the Self-Concept of Physically Handicapped Children." Therapeutic Recreation Journal, 13:39:43, 1979.
- (20) Shane, Harold G. "A Curriculum for the New Century," Phi Delta Kappan, 62:5:351-56, 1981.
- (21) Shea, Thomas Phillips, and Ann Campbell. "Outdoor Living and Learning Compliment Each Other." Teaching Exceptional Children, 4:3:108-18, 1972.
- (22) van der Smitten, Betty. Research Camping and Environmental Education. Penn State HPER Series No. 11, The Pennsylvania State University, 1975.
- (23) Van Matre, Steve. Acclimatization. Martinsville, IN: American Camping Association, 1972.

AGAINST THE RUNNING TIDE:
DEMOCRACY AND OUTDOOR RECREATION USER FEES

David Cockrell and J. Douglas Wellman

Abstract-- There is strong and growing interest in user fees for public outdoor recreation. As a contribution to the policy discussion about the coverage and level of fees, several arguments are presented which favor public provision of outdoor recreation opportunities at zero or nominal cost to the user. Historical, philosophical, and social psychological arguments address the benefits of outdoor recreation for a democratic society.

Additional Keywords: User fees, merit goods, conservation history, psychology of leisure, recreation policy.

INTRODUCTION

There is a groundswell of support behind an old idea, that those who actually use outdoor recreation areas should pay for them. Numerous articles have presented experiences or research data demonstrating the practical benefits fees can provide and discussing ways to implement pay-as-you-go recreation (e.g. Manning and Baker 1981, Flickinger and Waterson 1979, Crandall and Driver 1984). Participants at a recent conference on "Fees for Outdoor Recreation on Lands Open to the Public" were generally positive about fees, and that meeting led to the introduction in Congress of another National Forest recreation fee act in 1984. At the first National Wilderness Management Workshop, held in October of last year, Forest Service Chief Max Peterson expressed his support of user fees for wilderness areas. Further Forest Service support of user fees was provided in a recent report by Cordell and Hendee (1982), in which user fees were identified as the key to solvency of the recreational delivery system. Surveys of users indicate that majorities of them are receptive to paying (Driver and Rosenthal 1984). And, finally, we read of Minnesota's success with a cross-country skiing licensing system (Berrier 1984).

Thus, the trend toward outdoor recreation fees seems justifiable, expeditious and inevitable. In Marion Clawson's estimation, we can expect greater use of user fees, forced, most decisively, by the sheer competition for public funds. As he puts it, we can have "free" campgrounds that are dirty, or we can pay for clean campgrounds (Clawson 1984).

Any policy trend that seems as overpowering as user fees for outdoor recreation naturally arouses skeptical instincts. Are we about to rush off and make a grand mistake? Are some good things likely to be lost if we repudiate our long-standing commitment to zero cost or nearly free outdoor recreation? User fees may be, in the final analysis, the best course of action, but a major policy shift should be fully aired. The purpose of this paper is to examine several historical and contemporary ideas about the benefits of outdoor recreation. From the range of existing arguments for publicly-supported outdoor recreation, we have elected to focus on the benefits to the individual and the democratic society from intrinsically motivated activity and the sense of community involved in outdoor recreation.

As we engage in policy debate about user fees, we are obliged to profit insofar as possible from history. When the national park system started, with Yosemite in 1864 and Yellowstone in 1872, the visitor was expected to bear the costs. The Congress at that time assumed private entrepreneurs -- notably the railroads -- would provide all the support services needed, for a fee, and the parks would require no financial support from the government (Runte 1979). This cost-free idea never panned out, however. Inadequate management of the parks brought conditions to such a scandalous state that in both Yosemite and Yellowstone the U.S. Cavalry had to be brought in to protect the resources. The threats to the scenic and archeological treasures of the parks eventually led to the establishment of the National Park Service and a tradition of nearly free public recreation now approaching seven decades.

Hunters have also been financing state game management programs for years. The Pittman-Robertson Act of 1937 provided for an excise tax on hunting arms and ammunition, with revenues going into a revolving fund used to assist state agencies in habitat improvement and the development of management programs. The federal government provided 75 percent cost sharing for approved state programs. This program has often been cited for its success in providing a solid base of support for hunting.

However, it is not without its critics. A growing number of wildlife enthusiasts enjoy wildlife for reasons other than hunting. The nationalistic symbolism of the bald eagle, the sense of stewardship in the recovery work on the Peregrine Falcon, and the joy people derive from watching the annual procession at their bird feeders -- all exemplify the nonconsumptive benefits people derive from wildlife. Increasingly, nonconsumptive users are voicing their discontent with the emphasis wildlife management agencies place on game species. Ironically, too, species the agencies have been successful at managing, like whitetail deer, have become more and more the object of controversy from anti-kill groups, who value

them for their existence as part of a quality environment. In response to these measures, efforts are underway across the country to more equitably balance the programs of wildlife management agencies.

Thus, user fees for outdoor recreation have been with us for years, and we have found them less than perfect in several important cases. The issue we must address now is not whether we should have any fees for outdoor recreation. We already have them, and have for decades. The issue is the size and placement of the fees -- should they apply equally to all areas and users, and should they be high enough to cover all costs?

PUBLIC FINANCING AND OUTDOOR RECREATION

The basic mechanism for deciding who gets what in this country is the private market economy. In the marketplace prospective buyers send signals which inform producers of the value of their goods and services, and producers respond by adjusting the types and quantities of their products. Each consumer weighs his options and buys those things that have the greatest utility to him. The sum total of these rational decisions represents the most efficient course for the country. This is a highly individualistic system, at least in its pure form, as befits a country that venerates the rugged individual. When the conditions are right, the private market economy works wondrously well, and toothpaste and tires, pencils and Pontiacs are manufactured, priced and sold with minimal interference from government.

There are a number of times when the conditions are not right for operation of a private market economy, and to some extent outdoor recreation is affected by all of them. Common property resources, such as landscape beauty, do not encourage careful husbanding by individuals, since the costs of their actions are borne by all. Externalities cause some to bear the costs or to profit by the actions of others. For example, extensive clearcutting, paid for by hunters to increase whitetail deer browse and thus provide more deer for hunters to shoot, may also improve berry-gathering and harm trout fishing. Finally, some aspects of our outdoor recreation estate are such that some who derive benefits cannot be singled out and made to pay. Many Americans who have as much chance of backpacking in Denali National Park as we have of a ride on the space shuttle still benefit from Denali's existence. They read about it in magazines and watch TV specials on it, deriving pleasure simply from knowing it is there. They find comfort in the knowledge that, if they can't visit it, at least their children and grandchildren will have the opportunity to.

The most critical test of the fees for outdoor recreation question comes, however, not from these market failures, but from the merit good argument. Merit goods are things which could, at least in theory, be provided by private entrepreneurs, but which are considered so worthwhile that a public decision is made to override or supplement the private sector (Musgrave 1959). In essence, the existence of merit good decisions recognizes that economic efficiency isn't everything. The classic example is public education. It could be and often is supplied by private businessmen, but it has historically been considered so valuable that we provide for it through public action. The idea of merit goods runs against the basic economic doctrine of consumer sovereignty in deciding what to buy, since taxes are compulsory. However, the doctrine of consumer sovereignty assumes complete market knowledge and rational appraisal, two assumptions which often do not hold in a complex world with powerful methods of mass persuasion. With such distortions a collective judgment may be reached that reliance on the private market will result in socially non-optimal production and consumption of valuable goods and services. As determined by social judgments based on learning and leadership, then, we have decided that education, public health, libraries, museums, drug control and certain other services are meritorious enough to warrant violating consumer sovereignty and providing them at general public expense.

We believe outdoor recreation has attributes that justify it as a merit good worthy of public support. In the next section, we will review the thoughts of the fountainhead theoretician of the American parks movement and several contemporary thinkers on the individual and societal benefits of outdoor recreation.

VALUES OF OUTDOOR RECREATION

Frederick Law Olmsted

Olmsted is best known for his collaboration with Calvert Vaux in the design of Central Park, and for his many other urban nature-oriented parks that grace our cities. Recent scholarship (Roper 1973, Sax 1980) makes clear, however that this fascinating man was far more than a gifted landscape architect who left us a legacy of beautiful parks; he was also a theoretician whose park designs grew out of his powerful beliefs about American democracy.

For Olmsted, the primary value of parks lay in their contrast to people's everyday lives. Olmsted lived in a time of rapid social change brought on by urbanization and industrial development. He feared the loss of such social anchors as the family, church and tradition. Nature, brought to urbanites through carefully designed parks like Central Park, could provide a permanent standard of value against which daily tasks could be

measured. Olmsted sought to present nature in his parks so as to encourage visitors to set their own agendas, and experience the park at their own pace and with their own thoughts. He believed that nature was intrinsically interesting, allowing the exercise of what he called the contemplative faculty, an inherent human capacity for absorbed attention that was ignored in the workplace. Contemplative recreation thus offered all citizens in a democracy a chance for restoration, an opportunity to gain the perspective necessary for them to play their part in the survival of democracy.

Olmsted also worked toward the general goal of "communicativeness":

"...an all-embracing relationship based on the confidence, respect and interest of each citizen in all and all in each".

This criterion was important to his park plans. Some may look at the luxurious facilities of Central Park and conclude that Olmsted's park is another example of elites using public funds to advance their own interests. Nothing could be further from the truth. Olmsted incorporated luxurious facilities in his parks in a deliberate attempt to draw the wealthy and educated to the park, in the hopes that they would mix with the lower classes. His model was Birkenhead Park in Liverpool, England. In this quiet little park he saw a powerful engine of democracy.

Olmsted had seen many private parks in England, worth millions of dollars and requiring upkeep expenditures greater than that given the national schools, and their recreational and scenic benefits were the monopoly of the wealthy. In a democracy, he believed, amenities like these should be available to all the people. He did not agree with the apologists of aristocracy that working men and women were incapable of appreciating natural scenery and being improved by its influences. Therefore, in the United States it was the right and the duty of government to protect some natural areas and to make them readily available to all the citizens.

Olmsted's democratic idealism was of religious proportions, and it guided his professional life. He was convinced that if America's grand experiment were to succeed, our citizens had to have the capacity for liberty. At the same time, he did not believe that the configuration of a laissez faire private market economy and a weak government then in place would nurture the ability for self-governance. He called for an active government to provide public parks and gardens, as well as opportunities for art, music, sports and other healthful recreations which would combat the excessive materialism he saw developing. He was also very concerned with the potential for development in America of

clearly defined social classes such as existed in Europe. Large numbers of poor immigrants on the one hand, and the conspicuous display of great wealth on the other, fueled his concern with the breakdown of democracy.

Olmsted began his work on Central Park in 1857, four years after the New York State legislature had authorized land acquisition for the park. For six years he poured his life into the design and construction of the park, battling adversity all the way. He left Central Park to serve in the Civil War, and after the war he went west to manage the Mariposa Estate, a mining operation in California.

This job was not an excuse for a trip or a ducking of responsibility, although Olmsted did not relish returning to the political struggles at Central Park. Olmsted took on the California job with the idea of refuting English critics of the United States who claimed that the frontier crudities found here were the natural product of democracy. The barbarous, lawless, wild west community at Mariposa gave Olmsted a chance to do some social engineering, to transform it into a garden spot and undercut the British critics. For reasons far beyond his control, Olmsted did not succeed at Mariposa. But the job brought this remarkable man and the extraordinary Yosemite valley into contact, and the thinking he went through at Mariposa helped him develop his ideas on parks and their role in a democracy.

Yosemite Valley and the Mariposa Grove of giant sequoias were granted to the State of California in 1864. Olmsted was, in all likelihood, one of those who recommended this precedent-setting legislation. Following the grant, Olmsted was installed as one of nine state commissioners charged with developing a plan for the new state park. Olmsted took the lead in this planning, and the outcome strongly reflects the democratic idealism presented above. Olmsted's report was the first systematic argument favoring governmental leadership in providing parks for people. It linked democratic philosophy and Olmsted's theory of the benefits of encounters with nature.

Thus, one hundred and twenty years ago the foundation of a philosophical justification for public outdoor recreation was developed. By attracting people from all social classes, parks would combat a tendency for social stratification and promote a healthy sense of community. By providing workers with a natural setting that encouraged their individual responses and provided contrast to their daily lives, parks would help America's people develop their ability to govern themselves. These ideas were not entirely original with Olmsted. Thoreau, for example, had espoused the value of nature-oriented parks as a contrast to material preoccupations. Later thinkers, too, would sound one or more of the themes, as did Aldo Leopold in advocating wilderness

preservation for its value in educating Americans about the pioneering genesis of our culture. We have chosen to highlight Olmsted's philosophy because it is both early and thorough, and because it provides such an enlightening counterpoint to contemporary leisure theorists.

Leisure, Perceived Freedom and Leisure Subcultures

The benefits of outdoor recreation espoused by Olmsted have now evolved into well-developed bodies of leisure theory. Of course, the roots of these theories were developed long before Olmsted. De Grazia (1963) translates the Greek definition of leisure as "freedom from the necessity of being occupied". Freedom is the key mental state in leisure, and leisure is independent of time and behavior. In fact, no "occupation" is admissible in leisure for Aristotle, not even recreation, which was necessary as restoration for work. Music and contemplation are the exemplary classical leisure experiences.

Perhaps we should elaborate briefly the idea of contemplation during leisure, as it was a key element in Olmsted's rationale for park preservation. For De Grazia and Aristotle, contemplation is a state of passive receptivity to the environment. The contemplator has no manipulative design on the environment and is thus detached and free from it. Because of his receptiveness and rapt attention, however, the contemplator is also, in a sense, at one with the environment; in an ego-less state of heightened awareness and reduced needs.

The classical notion of leisure is diluted, modified and even dismissed as an idealistic fantasy by some leisure service professionals. The potency of this vision is still with us, however, and many current conceptions of the worth of leisure are strongly influenced by the classical ideal. Gunter's (1979) more eclectic model, for example, discussed eight subjective properties of the leisure experience, many of which are integral to the classical ideal:

- 1) A sense of freedom from constraint, an increase in personal choice;
- 2) The experience is self-contained and self-maintaining, that is, an end in itself;
- 3) Intensive involvement and enjoyment of the activity;
- 4) A lack of time awareness, or a sense of timelessness;
- 5) Separation from the work-a-day world, suggesting the possibility of fantasy;
- 6) Creativity;

7) Spontaneity; and

8) A sense of adventure, exploration, and curiosity.

The focus on freedom, enjoyment, timelessness and creativity are clearly classical references. Gunter's inclusion of "adventure and exploration" suggests a more active conception of leisure, perhaps influenced by current theorists of play (e.g. Ellis 1973). Csikszentmihalyi's (1975) "flow" experiences emphasized similar psychological dimensions: a contraction of the perceptual field, a heightened concentration on the task at hand, a feeling of control leading to elation and finally to a transcendent loss of self-awareness. Flow, in contrast to classical leisure, occurs during intense activity when the environment seems to provide clear, non-contradictory demands for action and subsequent unambiguous feedback. Flow, or play, is perhaps the active phase of leisure, while contemplation is the passive phase. Both phases, however, are intrinsically rewarding and enjoyable and both build a sense of personal choice and freedom.

So what, one might ask, is the relevance of the classical leisure ideal for outdoor recreation and ultimately for user fees? First, perhaps, it should be said that true play or the classical leisure ideal is difficult to achieve anywhere, but especially through the highly structured, externally motivated recreation common in America. As Csikszentmihalyi (1978) has pointed out, the performance of behavior for external rewards (in work or recreation) is so much the dominant motivational model in western societies that emergent, intrinsic rewards are often completely overshadowed. Much of our recreation is motivated by the desire to make business contacts, meet sex partners or be seen doing something prestigious, rather than by curiosity, exploration and intense involvement, an activity done for its own sake (Cheek and Burch 1976).

The classical leisure ideal has been perpetuated in our culture to a large extent through the transcendental concept of the "wilderness experience", a fragile fantasy involving a pioneer heritage, perceived risk and great aesthetics. Scott (1974) pointed out the similarities between psychologies of self actualization and peak experiences and the descriptions of wilderness experiences offered by George Catlin, John Muir, Loren Eiseley and Colin Fletcher. The state of consciousness Scott describes emphasises depersonalization and an altered time sense, and it bears many similarities to the neo-classical conception of leisure. Leisure, self-actualization and the wilderness experience seem closely related psychological phenomena. Accounts of fragile, transcendent contacts with nature over the 150 years from Olmsted to Scott may partially explain our societal reluctance to put a price tag on the experience.

The more constraints placed upon the recreationist by such regulatory management techniques as fees, the less likely it is that the recreationist will achieve "leisure". As constraint and control of an individual's behavior increase, the experience of perceived freedom and leisure diminish (Neulinger 1974, p. 18).

Now, one might argue, the payment of a \$5 user fee is hardly a sufficient constraint to dissipate the pioneer fantasy of a challenging wilderness trip. Kleiber (1979) proposed that individuals who attribute the causes of events to their own actions should not feel externally controlled and are likely to feel more freedom. While limitations in research methods prevented clear conclusions in Kleiber's (1979) research, those subjects who believed that people can change things and are not helpless did hold more positive leisure attitudes. It seems likely that user fees could discourage internal attributions of the causes of behavior, and thereby diminish the leisure experience.

Moreover, the spontaneity and "end-in-itself" tone of a wilderness trip may be significantly moderated by a recreationist's desire to "get his money's worth". Driver and Rosenthal (1984) concluded that users are willing to pay more for a higher quality opportunity, and the same opportunity is sometimes perceived to be of higher quality after an increase in fees! The payment of a user fee would seem to argue that there are things about the experience that the recreationist cannot control, and he had better monitor the rewards of the situation to decide whether he got a good deal. A typical (and accepted) American dilemma, but hardly the classical leisure ideal.

Beyond the philosophical definitions of leisure and the psychological dimensions of the experience, there are social ramifications of true leisure which may be impacted by fees. Kelly (1982) pointed out that many people see themselves first of all as rock climbers, builders and pilots of small aircraft or folk singers, even when their employment is something quite different. For these "amateurs" (Stebbins 1979), the leisure subculture becomes the primary source of self-definition and direction, i.e. it becomes the meaningful community.

Leisure subcultures are important countercurrents in American society, espousing a radical shift from values placed on results to values placed on experiences. Freedom and expression--not accomplishment--are central. Perhaps Olmsted's pan-cultural sense of community was a 19th century pipe dream, but 20th century American recreationists sometimes derive primary social identities from their leisure affiliations. The sense of community generated by social leisure can be an important contributor to self-actualization (Wilkinson 1979).

Opportunities and support for creative behaviors essential for self-actualization are provided by the community, and individuals are afforded the opportunity to take part in defining the leisure skills and intrinsic rewards implicit in leisure activities. In our view, support and nurturance of leisure subcultures is about as important a professional activity as exists in the parks and recreation field.

The impact of user fees on leisure subcultures is, of course, difficult to assess. Perhaps there will be no effect. But Manning and Baker (1981) found "loitering in parking lots" of a local developed park to decrease from 26% of the total park use before initiation of user fees to 6% afterward. This was, of course, reported as a desirable outcome of the fees program. But we are compelled to ask why that leisure group chose to move their social leisure to an alternative site when fees were imposed. Did they decide their activity was not worth the price of admission? What other leisure behaviors are not worth the price of admission and would be displaced? Did the fee communicate a management desire to restrict their behavior? Will wilderness users be reluctant to "loiter" in the backcountry when they have to pay to do so? Is inactivity illegal (De Grazia 1963)?

CONCLUSIONS

To summarize what we have said so far, user fees in outdoor recreation are neither a new idea nor a simple one. Examples of controversies generated by fees range from the early parks to current debates about priorities in user-funded wildlife management programs. It seems likely that the partial funding of national forest wilderness, national recreation areas, and wild and scenic rivers through user fees will result in similar complexities. Several results are probably predictable.

There will be, for example, questions about what sorts of "products" are actually being bundled and sold. It is logical for a producer to group together a number of different attractive products into a package deal to persuade more consumers to purchase. "Bundling" of products is particularly evident in leisure services (Sax 1980), where people are typically attracted to an experience for a number of reasons anyway. Thus, ski resorts sell clothes, gear, food, shelter, passive entertainment, a ride up the mountain, and a ride down if you get hurt. The problem with bundling public outdoor recreation experiences is that too many of the recreationist's choices are made for him. If we believe in leisure, then we must protect the recreationist's right and responsibility to make his own choices. If fee monies become the measure of productivity in outdoor recreation, it seems reasonable to expect more bundling of recreation opportunities, and less choice.

Also, stimulation of private competition is often cited as a benefit of user fees programs. But the substitutability of private facility-oriented opportunities for public resource-based opportunities is questionable. Perhaps public recreation areas should concentrate on provision of nature-oriented leisure emphasizing freedom, intrinsic rewards and development of leisure communities, while perimeter business handles the consumption-oriented facilities and recreation experiences. This model is followed by the town-site approach in Canadian Parks. Leisure is integrally bound to freedom, and recreation managers and programmers should build a focus on personal freedom and choice into their policies and actions.

Implications

Much of what we have said in this paper echoes the position taken by Dustin, McAvoy and Schultz' (1982) Stewards of Access, Custodians of Choice. These authors suggest that park and recreation professionals can lead a fundamental shift in American values, cultivating environmental awareness through education. While Dustin, McAvoy and Shultz rest their case for public recreation on ecological imperatives, we base ours on the freedom, intrinsic motivation and leisure subcultures important to the successful functioning of our democratic system of government.

User fees probably can be compatible with an emerging ethical imperative for the park and recreation profession. They will only be compatible, however, if they reflect a well-formed philosophy guiding the total management effort of a recreation resource. The generalizations we have offered are really only skeletal ideas. The fleshing out of these principles into management guidelines has yet to be accomplished. There will almost certainly be many complexities in application, contradicting principles, and exceptional situations. Our intentions in this paper have been to examine the historical and philosophical issues involved in pay-as-you-go recreation, and to suggest an ethical framework from which to proceed. As we said in the beginning, fees seem justifiable, expeditious, and inevitable. Our hope is that they may be applied judiciously by conscientious professionals, and not as a quick fix for a sagging recreation resource system.

LITERATURE CITED

- Berrier, D.L. 1984. Minnesota's new cross country skiing program. Paper presented at the conference on fees for outdoor recreation on lands open to the public. Durham, N.H. Jan. 1-3.
- Cheek, N.H. and Burch, W.R. 1976. Social organization of leisure in human society. N.Y.: Harper and Row.
- Clawson, M. 1984. Outdoor recreation: 25 years of history, 25 years of projection. Paper presented at the twenty-five year symposium, School of Forestry and Wildlife Resources, Virginia Polytechnic Institute and State University, Blacksburg, VA, April 19, 1984.
- Cordell, H.K. and Hendee, J.C. 1982. Renewable resources recreation in the United States: Supply, demand, and critical policy issues. Amer. For. Assn., 1319 18th St. N.W., Washington, D.C.
- Crandall, D.A. and Driver, B.L. 1984. Recreation on public lands: Should the user pay? American Forests, March, 1984: 10, 49-51.
- Csikszentmihalyi, M. 1978. Intrinsic rewards and emergent motivation. In Lepper, M.R. and Greene, D. The hidden costs of reward: New perspectives on the psychology of human motivation. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- Csikszentmihalyi, M. 1975. Beyond boredom and anxiety. San Francisco: Jossey-Bass.
- De Grazia, S. 1963. Of time, work and leisure. New York: Anchor Books.
- Driver, B.L. and Rosenthal, D.H. 1984. Public responses to user fees. Paper presented at the Conference on fees for outdoor recreation on lands open to the public. Durham, NH, Jan. 1-3.
- Dustin, D.L., McAvoy, L.H. and Schultz, J.H. 1982. Stewards of access, custodians of choice. Minneapolis: Burgess Publishing Co.
- Ellis, M.J. 1973. Why people play. Englewood Cliffs, N.J.: Prentice-Hall.
- Flickinger, T. and Waterson, M.F. 1979. How to tighten the belt without pinching yourself. Parks and Recreation, March 1979: 34-36.

- Gunter, B.G. 1979. Properties of the leisure experience. IN
 Ibrahim, H. and Crandall, R. Leisure: A psychological
 approach. Los Alamitos, Ca.: Hwong, Inc.
- Kelly, J.R. 1982. Leisure. Englewood Cliffs, N.J.: Prentice-
 Hall, Inc.
- Kleiber, D.A. 1979. Fate control and leisure attitudes.
 Leisure Sciences 2(3/4):239-248.
- Manning, R.E. and S.C. Baker. 1981. Discrimination through user
 fees: fact or fiction? Parks and Recreation 16(9):70-74.
- Musgrave, R.A. 1959. The Theory of Public Finance: A Study in
 Public Economy. New York, NY: McGraw-Hill.
- Neulinger, J. 1974. Psychology of leisure. Springfield, Ill.:
 Charles C. Thomas.
- Roper, L.W. 1973. FLO: A Biography of Frederick Law Olmsted.
 Baltimore, MD: The Johns Hopkins Press.
- Runte, A. 1979. National Parks: The American Experience.
 Lincoln, NB: Univ. of Nebraska Press.
- Sax, J.L. 1980. Mountains without handrails. Ann Arbor:
 University of Michigan Press.
- Scott, N.R. 1974. Toward a psychology of wilderness experience.
 Natural Resources Journal 14: 231-237.
- Stebbins, R.O. 1979. Amateurs: On the Margin between Work and
 Leisure. Beverly Hills, CA: Sage Publications.
- Wilkinson, K.P. 1979. Social well-being and community. Journal
 of the Community Development Society+ 19(1):5-16.

RECREATION MANAGEMENT IN A REGION CONTEXT

Joseph P. Wallace

ABSTRACT

An analysis of recreational resources within a region can prevent an over abundance of some types of recreational opportunities and a shortage of others. Such an analysis can prevent duplication of effort between public and private recreational suppliers while detecting unique resources or opportunities.

Information from this analysis can be used to improve coordination between agencies allowing potential visitors to be more effectively informed of the variety of opportunities available within a region.

This discussion uses a comparison of the Chattooga Wild and Scenic River with other whitewater rivers as an example of the development of a regional overview.

THE PROBLEM

For many years, researcher have recognized the need to provide a variety of recreational opportunities within a given area (Lime 1973). They have expounded on the necessity for more coordination and cooperation between public agencies and private recreation management to provide recreational variety and to inform visitors of opportunities available in an area (Driver - Rosenthal 1979).

There are many nation trends which suggest these needs to be greater now than ever before. Consider:

- (1) An estimated one out of every \$8 spent in the United States is devoted to leisure (Journal of Forestry 1985);
- (2) National concerns for physical fitness;
- (3) Equipment development which has not only reduced costs but the knowledge and skill necessary for its use;
- (4) The increasing average age of the U. S. population and migration to the "Sun Belt" states;
- (5) The prediction of a 20 hour work week by the year 2020.

These trends point toward rapidly increasing demand for recreational activities.

On the other hand, there are supply trends which need to be taken into consideration.

- (1) Recreation budgets for public entities will decline as a result of the need to reduce the federal deficit.
- (2) There is a growing movement to charge for use of here-to-fore "free" public recreational activities.
- (3) Population movement to the "Sun Belt" will diminish the land base and increase demands for land, water and timber as well as recreation.

Increasing cooperation and coordination between government agencies and private sector managers can reduce inefficiency caused by duplication of similar recreational opportunities. An overabundance of similar opportunities can result in under utilization of the resource; i.e. low occupancy rates in developed campgrounds. Conversely, a shortage of opportunities can result in over use which could damage or destroy a resource. Both possibilities result in unnecessary expenditures of finances.

An analysis of the opportunities available in a region can detect resources or opportunities which may not be readily available. It could also point out any over abundance of an opportunity, indicating that the resource should be managed differently. The inclusion of user questionnaires (to determine preferences, expectation and use patterns) into the regional analysis will enable planners to design new facilities or remodel existing areas to better match the use to the resource. This procedure can solve many of the costly problems which on-the-ground managers confront daily.

THE CHATTOOGA RIVER STUDY

In this concept, the term "REGIONAL" is not bounded by geographical areas but rather by marketing areas from which visitors will travel. Depending upon the recreational opportunity or the resource involved, areas of consideration will vary. For instance, a city park plan may need to only consider the range of opportunities within a metropolitan area.

A recent analysis done by the Staff of the Andrew Pickens Ranger District is an example of a regional overview.

Chattooga River background

The Chattooga River is managed by the Andrew Pickens Ranger District of the Sumter National Forest. Located on the headwaters of the Savannah River, this river forms the boundary between Georgia and South Carolina.

The Chattooga River was the South's first National Wild and Scenic River (included in the National Wild and Scenic River System in 1974). The river offers 40 miles of essentially undeveloped pristine experience with only an occasional bridge or road giving evidence of the outside world. There are no railroads or highways along the shoreline. Only a half dozen cabins can be seen along a little used portion of the river. Most of the old logging or

settlement roads were closed by the Forest Service soon after the river was included in the National Wild and Scenic River System. Since 99% of the land within one-quarter mile of the river is part of the National Forest System, the river can be protected and managed for future generations by a single federal agency.

The water is cold, clear and pure. Coliform bacteria counts (with some exceptions) have declined over the years and are now near levels of an undisturbed mountain stream. The Chattooga Wild and Scenic River is completely free-flowing with no dams to alter its flow. The river drops one-half mile in elevation over its 40 mile length, offering outstanding whitewater floating challenges. Numerous highly technical Class III, IV and V rapids challenge paddlers. The Five Falls area on the lower part of the river is a tough 300 yards where the river drops 75 feet over four Class V, one Class IV and one Class III rapids.

Use of the river has increased from 800 floaters in 1971 to over 60,000 floaters in 1984. Of this 60,000+ users, approximately 20,000 are non-commercial (non-outfitted) and 40,000 are commercial (outfitted) floaters. The Chattooga River is essentially a day-use stream with fewer than 5% of the floaters camping overnight along the river. Twenty-two million people live within a 250 mile radius of the Chattooga River. Based on analysis of 1981 user registration permits from a self-registration system, the "average" user lived 120 miles away from the river.

Congress mandated that the Chattooga Wild and Scenic River be managed for isolation and seclusion. The Wild and Scenic Rivers Act specifically states that the river "...be administered in such a manner as to protect and enhance those values which caused it to be included" (Public Law 90-542). Throughout documents prepared when the Chattooga River was being studied for Wild and Scenic River designation, isolation and seclusion are mentioned: "The main attraction of the Chattooga River is its recreation opportunity -- the chance to visit a white water river and experience solitude, adventure and challenge." (Wild and Scenic River Study Report, June 1971).

The incongruity between continually rising recreational use and a mandate from Congress to provide isolation has raised many questions. Did Congress err in their determination to specifically manage the Chattooga River for isolation and seclusion? Are there other rivers which could offer the same type of experience? If so, how many? Are there other rivers which could offer higher experience levels? If there are no other rivers comparable to the Chattooga River, it would leave few alternatives for the Forest Service to consider. Needless to say, answers to these questions had strong implications on the direction of the new management plan for the Chattooga River.

Basic inventory data

Before a manager can consider a regional analysis of any resource, there must be a basic inventory of that particular resource. Such an inventory should include an intimate knowledge of the physical attributes of that resource, of the people who use it, of the way the resource is used and of the anticipated results of this use.

Physical inventory

An intimate knowledge of the physical characteristics of areas is the most important information needed for realistic comparisons of resources. In the case of the Chattooga River, Congress mandated that the recreation experience include seclusion and isolation. As there are few pristine whitewater rivers remaining in the southeastern United States, comparison of similar recreational experiences was limited to streams which offer this experience.

Due to dissimilarities between whitewater streams, evaluation criteria were developed to define the type of recreational experience offered based on the physical characteristics of each stream. First-hand knowledge of some of the streams was gained through personal observation (floating).

Use patterns

Although this data was not required for the comparison of isolated, whitewater rivers in the southeastern United States, use patterns could play an important part in analyzing differences in recreational experiences. Such information is available for the Chattooga River through the compilation of data from user registration permits. Since 1975, all floaters have been required to complete this form at seven self-registration stations located at access points. The form includes launch time, put-in and take-out sites, number of visitors, type of craft as well as name and address of the group leader. The regional analysis on whitewater streams was limited to the availability of similar resources within the region. Use trend information was not directly used in this study. This information was, however, used in the formulation and evaluation of management decisions. Comparison of current use patterns with use in previous years could aid in the detection of less than obvious changes in user trends. An example of the analysis of user patterns is one conducted on the Chattooga River.

"Use is not well distributed throughout the year. Fifty-eight percent of the private and sixty-two percent of the commercial use occurred in May, June and July in 1981. Furthermore, thirty-seven percent of the total private and twenty-one percent of the total commercial use occurred on weekends during May, June and July 1981. Almost seventy-seven percent of floaters launch between 9:30 a.m. and 12:00 a.m." (Wallace 1983).

Opinion polls

Visitor expectations from use of a resource, attitudes toward management alternatives (either existing or proposed) and perceived problems also provide information for a regional analysis. Such an analysis may indicate that some areas are more capable of fulfilling certain visitor expectations than others. For instance, the Chattooga River offers less opportunity to "meet new people" but a greater opportunity to "be away from crowds" than such whitewater rivers as the Nantahala or the Chattahoochee.

Another example of opinion poll use is a comparison of two opinion polls conducted on the Chattooga Wild and Scenic River: one by Dr. Gordon Howard (Howard 1976) and another by Carol Townsend (Townsend 1982). Howard's study

was similar to the National river recreation format used by Townsend. Floaters in 1975 totaled 20,000 and had increased to 37,000 in 1981. Comparing results of the two questionnaires indicated a 26% increase in the number of floaters perceiving crowding to be a problem during a period when use increased 85%. Undoubtedly, some individuals were "displaced" due to crowding, i.e., those who used the river to experience solitude had moved away to other rivers or other recreational pursuits. Since it is almost impossible to track users who have moved on to other recreational pursuits, no one knows the magnitude of displacement which occurred during that period.

Neither user registration information or opinion poll data were used in the regional analysis of streams similar to the Chattooga River. Such information would be applicable in analyses where less unique resources were being considered. Had the physical analysis indicated an abundance of rivers in the southeastern United States which could offer high isolation/seclusion levels, emphasis would logically shift toward providing more for public desires than resource protection.

Regional resource overviews

In 1983, after comparing Townsend's (1982) and Howard's (1976) data, the overcrowding problems were recognized. A study (Wallace 1983) was undertaken to begin updating the Chattooga Wild and Scenic River Management Plan. Prior to any revision of this plan, it was necessary to determine the degree of crowding and to more accurately define the management goals of the river in terms of floating use.

To determine how the Chattooga River compares with other whitewater rivers in the southeastern United States, 45 major rivers and streams within 250 miles of the Chattooga River were evaluated. Six criteria were used to compare these whitewater streams to determine if they were capable of providing an isolation/seclusion whitewater experience. The first (and most important) criteria was whether or not the river could offer an isolation/seclusion experience. Many rivers in the South are bordered by railroads, highways and houses; there were few on which floaters could pursue their activities without high evidence of civilization nearby. The second criteria was whether some agency or agencies could control future use if necessary to guarantee isolation/seclusion. The third criteria was the presence of Class IV and V rapids offering challenge and excitement to the whitewater floater. The remaining criteria were that the river should be free flowing with low pollution levels and sufficient volumes of water for rafting. Sufficient water volume for rafting was considered important because rafting is generally where most novice whitewater paddlers first get their experience. These people would probably begin their whitewater floating through commercial rafting trips.

Data for comparing the Chattooga River to other rivers were collected from books, pamphlets and other written materials, as well as telephone interviews with private boaters, outfitters and river managers throughout the South. The survey was informal, and problems were encountered. For instance, considerable confusion existed over local names of launch points, take-out points and definition of river segments. There was conflicting opinions from various individuals. It was difficult to determine which source was most knowledgeable. Many of these problems could have been avoided by designing a more

systematic approach to information gathering techniques. In spite of this, the results of this composite analysis are more reliable than information based on a single person's ideas or opinions.

Criteria selected for comparison

1. River must be capable of offering a primitive experience relatively free of evidence of civilization. (This is an opinion of various individuals with much room for deviation.)
2. River must offer, as a general rule, a quality whitewater opportunity with Class IV-V rapids at normal water levels.
3. Some State or Federal agency should be able to control use to assure the primitive (isolation) experience offered in the future.
4. River must be free-flowing.
5. River must have low pollution levels.
6. River must contain an adequate water volume for rafting.

These criteria are listed in order of importance. Once a stream could not meet one of the criteria, it was removed from further consideration. From the 45 rivers studied, those capable of offering a primitive experience are listed in the following table. Only those streams with an X in each criteria are comparable with the Chattooga Wild and Scenic River.

River	State	Criteria #					
		1	2	3	4	5	6
Mulberry Fork	AL	X					
Little River	AL	X	X	X	X	X	X
Hatchett Creek	AL	X					
Flint	GA	X					
Conasauga	GA	X	X	X	X	X	
S. Cumberland	KY	X	X	X	X	X	X
Red	KY	X	X	X	X	X	
French Broad*	NC	X	X	X	X	X	
Chattooga	SC	X	X	X	X	X	X
Chauga	SC	X					
Obed	TN	X	X				
Clear Creek	TN	X					
Daddy's Creek	TN	X	X	X	X	X	X

Figure 1. -- Attributes of rivers capable of offering a primitive experience

* in Transylvania County

As the table clearly indicates, only three other whitewater streams (Little River, South Cumberland and Daddy's Creek) within 250 miles of the Chattooga River have the potential to offer this kind of recreational experience. If future generations are to enjoy that type of experience, the Chattooga River should be managed expressly for that particular experience. One important element of management of the Chattooga Wild and Scenic River is likely to involve use limitations.

IMPLICATIONS OF REGIONAL ANALYSIS

Analyzing the Chattooga River in a regional context has revealed that this river is a truly unique resource. The next challenge will be to incorporate this concept into a revised river management plan.

Regional analysis should make securing adequate personnel and funding to carry out management objectives more easily justified. While the Chattooga Wild and Scenic River has not been shortchanged in the past, additional needs can be more easily understood when they are based on firm data.

Some groups will consider rationing and allocations to control crowding an infringement on their rights. There may be challenges to agency decisions. Such challenges can be more easily answered and readily accepted by users since decisions will be based on explainable data. The majority of users will appreciate efforts to protect the isolation and seclusion offered by the Chattooga River. Protection and management of this unique resource will add diversity to the recreational opportunities in this region for future generations.

LITERATURE CITED

- Douglas, Robert W., Baechle, Andrew G., Ries, Paul D. and TSAI, Huei-Min 1985. The need for a national outdoor recreation assessment: an SAF working group survey. *Journal of Forestry*, January 1985, p. 43.
- Driver, B. L. and Rosenthal, B. H. 1973. Measuring and improving effectiveness of public outdoor recreation programs. USDA, Forest Service, Rocky Mountain Forest and Range Experimental Station, Fort Collins, CO.
- Howard, Gordon E. 1975. Chattooga River visitor survey, Clemson University, Clemson, SC.
- Lime David W. 1973. Behavioral research in outdoor recreation management: an example of how visitors select campgrounds. In *Environmental and the Social Sciences: Perspectives and Applications*, American Psychological Association, Inc., 1200 Seventeenth St., N.W., Washington, D.C.
- Lime, David W. 1974. Locating and designing campgrounds to provide a full range of camping opportunities. *Outdoor Recreation Research: Applying the Results*, USDA Forest Service, Marquette Michigan, 1973.
- Lime, David W. 1976. Proceedings of the southern states recreation research applications workshop, Asheville, NC.

ORRC 1962. Action for Outdoor Recreation for America. 1001 Connecticut Avenue, Washington, DC

Townsend, Carol 1982. Chattooga River users characteristics, perceptions of problems and attitudes toward management options. Master's Thesis, North Carolina State University, Raleigh, NC.

USDA, Forest Service. 1971. Wild and scenic river study report, Chattooga River. USDA Forest Service, Southern Region, Atlanta, GA.

Wallace, Joseph P. 1983. Chattooga River -- recommended management objectives and rationing techniques. USDA Forest Service, Walhalla, SC.

RECREATIONAL USE IN THE MARINE ENVIRONMENT:
SOME THOUGHTS ON CONFLICTS AND THEIR RESOLUTION

Niels West

Abstract.--Three sets of factors appear to have led to a deplorable low level of knowledge about marine recreational activities. These are summarized as follows: (a) existing outdoor recreational research has been largely topical, (b) marine recreational research is primarily concerned with terrestrial (facility oriented) problems; and (c) growth in marine recreational activities has been broadened by new materials and technologies attracting many additional participants. A classification of marine use conflicts is presented with suggestions for their possible solution.

Additional keywords: Marine recreational developments, marine recreational classification, marine recreational trends, marine recreational conflicts.

INTRODUCTION

The purpose of this paper is to explore recent marine recreational trends particularly as user pressures impact both terrestrial and nearshore marine resources. In addition, a framework will be presented identifying user conflicts, particularly as these take place in the marine environment. Finally, some suggestions for resolving marine resource will be offered.

Much has been written in recent years about the adverse impacts caused by the growth in recreational pursuits. (Henley, 1967; Seabloom, 1969; Bishop & Aukerman, 1970; David, 1971; Anderson, 1974; Wilman, 1978; Heatwole, 1982; Chmura & Ross Anderson, 1980; West, et al. (1982)) While most of these discussions have been concerned with the development of more and larger facilities, a growing number have addressed the adverse environmental impacts recreation on the physical environment. Suggested solutions have usually taken one of two forms: limiting access (Ducksik, 1974; Crandal, 1974; Betty, 1975; Brower, 1976; Owens, 1976; Maloney, 1977; McFarland, 1978; Nixon 1978; and Swim, 1983), or enlarging recreational facilities. Ways of limiting access have been accomplished through various pricing mechanisms, or through the use of permits. Increasing the supply of facilities has been difficult, time consuming and above all, costly, particularly in instances where federal and state permits are required.

Before analyzing the marine recreational trends, three premises are suggested which are believed to have been of paramount

importance in the management of recreational resources and activities:

1. Data information and most recreational research and planning have been based on an activity by activity basis without much thought of integrating the various recreational (and non-recreational) activities.
2. Most recreational research has addressed terrestrial problems and where marine recreational studies have been undertaken, they have been primarily concerned with terrestrial (shoreline) issues.
3. Improved technology has revolutionized some recreational activities, extending the public's ability to engage in and utilize environments which in the past have been limited to very few.

In this country, outdoor recreational planning has followed closely the ways in which planning has been undertaken in general. It is suggested that these approaches are very comparable to ways in which problem solving has been undertaken in the past. Solutions have been developed (with due considerations to financial, social and more recently environmental factors) to address very specific problems. For example, when marina space is in demand, efforts will usually be made to develop slipspace without investigating the possibilities for integrating marina developments with other passive and active recreational usages such as shorebased fishing, strolling, sightseeing, etc. In fact, a cursory review of recent outdoor recreational research literature reveals a highly topical or specialized approach. These have in several instances resulted in subfields within the broader area of outdoor recreation including marine recreation. Sports fishing, boating, and diving interests are but the better known examples of marine recreational activities which have developed specialized constituencies and research areas. As an academic with a research interest in Coastal Zone Management with a special emphasis on marine recreation, I believe the academic community is partly responsible for these developments. In the same context, I am convinced we must begin to look at marine recreational activities as systems which can support more than one form of activity within a given marine environment. Should this be accomplished we may succeed in enhancing the recreational experience for both the primary and secondary user.

In the event that we continue on the existing path, I fear that the facilities and services providing for the public will increasingly become standardized. The day may not be far away when marina services, bait, diving shops and other service centers will become franchised. While offering efficiencies to the consumer which may well attract a greater number of participants, it is reasonable to expect that some of the excitement

associated with recreational participation will be lost. As professional managers, planners and researchers I firmly believe we have an obligation to counter what I refer to as the "Howard Johnson Syndrome." Once you have been in one you know the lay out, level of service, even the quality and quantity of food offered on others. In short, anticipation, excitement about the experience is significantly lowered. This trend is already evident in numerous urban waterfront developments where exposed red brick appears to be the standard fare (Robinson, 1979). Boat charter franchises have moved from the planning stages to actual implementation. The former owner of both Ryder and Jartran truck and trailer rentals has established several sailboat rental franchises in Florida in an effort to duplicate these accomplishments in the recreational boating industry.

The second premise which has had a fundamental impact on marine recreational management concerns the geographical location of planning, management and research. With very few exceptions, most research (applied as well as basic) planning and nearly all management efforts have addressed shorebased problems. In fact, both the Coastal Zone Management Act and the Land and Conservation Foundation Program (LAWCON) which have funded marine recreational research and led to many of the public marine recreational facilities have been decidedly concerned with shorebased problems. Although the territorial jurisdiction of the C.Z.M.A. extended seaward to the end of the territorial sea (three nautical miles seaward of the baseline) the Ocean and Coastal Resources Management Office's (formerly Office of Coastal Zone Management) early efforts were primarily concerned with the problems associated with the terrestrial portion of the coastal zone. These problems have been especially acute in the context of marine recreation where literally all research and planning efforts have terminated at the water's edge. While it is clear that the majority of "coastal problems" are terrestrial in nature, one needs only to point to a few of these problems -- such as limited parks and beaches (McCloy & Dodson eds. 1981), few and often inadequate ramps and marinas (Ward & Cushman, 1967; Bender & Winsor 1979), overcrowded mooring basins, absence of fishing piers (Buckley & Walton, 1981) and other suitable places for shorebased fishing (Freeman, nd.), and deteriorating waterfronts which detract from the visual experience of the passive recreational user (Moore & Childs, 1971; Mann, 1973; Gunn, 1974; Moss, 1976; Dix, 1979; Cowey, 1979; Clark, 1979; Warner, 1979). Nonetheless, significant problems are beginning to emerge on the water resource itself between recreational uses of the environment and other legitimate uses (Firle & Needham, 1980). These problems will be discussed further below.

The third premise concerns the impact which late 20th century technology has had on several marine recreational activities, including boating, diving, and to a lesser extent, fishing.

There is little doubt that the development of a host of new manmade materials has revolutionized boating in at least two ways. First, it has facilitated the development of light weight mass-produced hulls ranging from relatively inexpensive surfboards and windsurfers to very expensive oceangoing maxihulls. The cost of the raw materials has increased significantly, associated with the increased cost of hydrocarbons from which most of these materials have been produced. These compensating cost savings have been made in both the production of hulls and fittings with the result that boating as a recreational activity has become available to a much broader section of the general public. In this context there are important differences between yachting activities of yesteryear and boating as it is known today. In fact, a persuasive argument can be made that boating no longer is limited to the wealthy few (Rorholm, 1976) but can now be engaged in by anybody within reach of a body of water. This is in part, because of raw materials considerations, and in part because of size. Today, relatively small, fast, and safe vessels can be obtained for not much more than it would take to be equipped for downslope skiing.

The revolution which is in evidence at the smaller, less expensive end of the market is also evident for the medium sized vessels as well. It is not at all uncommon to find trailerable cruising boats (both sail and power) ranging upwards of 26 Length Overall (LOA) capable of sleeping four or five (in what admittedly are quite close quarters).

The increased efficiencies in sailboat design are evident for powerboats as well, although for somewhat different reasons. Since the escalation of fuel prices during the early 1970's, power boat designs have undergone very significant developments both with respect to changes in the hull configuration and in the manner in which the engines are being utilized (Fridgen, nd). First, today's hulls are lighter and more efficient. The new hull configurations do not require as much power as less water has to be moved as the boat moves through or rather on top of the water. Second, engines on the whole have decreased in size relative to the size of the boat with a corresponding decrease in the top speed of the boat. Since fuel consumption increases disproportionately with the speed of the boat, overall operational costs of the modern powerboat have remained relatively stable.

Improved or modified technology has manifested itself in other recreational activities as well. Scuba diving has literally opened up an entirely new environment to well over two million Americans alone. Improved diving suits and associated equipment have extended the diving season in the mid-latitudes and the depth at which these activities can be safely pursued (Matheusik & Mills, 1983).

It is probably a reasonable assertion that there is hardly a

marine recreational activity which in some ways has not been affected by the innovations in new materials and the development of new technologies. Stronger sports fishing equipment in combination with sonar (fishfinder) and similar gear have significantly improved fishing opportunities both in the near and off-shore marine environment.

There is persuasive evidence that the technical improvements which have been made in outdoor recreational equipment have contributed very significantly to the continued growth in marine recreational activities. Certainly the increases which have been evident can't be attributable to the growth in population alone, nor are they due to increased disposable income and leisure time. The continued growth in outdoor recreation in general and marine recreation in particular is, in all likelihood, due to a broadening of participation by groups who in the past did not participate because of ability, age, sex and a host of socio-economic and environmental factors.

It is further suggested that the singular approach which has characterized much of MRM (Marine Recreational Management) and research has contributed to the potential problems likely to face the recreational user of the marine environment. Finally, the near absence of research which has been undertaken in the marine environment (as opposed to the coastal environment) (Richardson, 1977; Litton, 1966, Lentnek et al., 1969; Ashton & Chubb, 1972; Chaney, nd.) has further aggravated the problems confronting both MRM and their constituencies.

The following sections briefly outline a classification of the conflicts confronting the marine recreational user, and attempt to offer some resolution to these problems.

MARINE USE CONFLICT CLASSIFICATION

Marine resource conflicts can be broken down into three groups. The first is characterized by those occurring between major user groups such as commercial fisheries, and commercial shipping, recreation and both commercial fishing and shipping. The second group of conflicts occur between and among subgroups within the same categories of users. Examples include gillnetters and dragners, and between trap fishermen and those interested in developing aquaculture operations. In a recreational context, shorebased fishing is incompatible with most other forms of active beach recreation. Similarly, water skiing can't easily be undertaken in waters where other forms of surface recreational activities take place. The third category includes those which occur within specific subgroups and are primarily concerned with decreased utilities caused by increased density of uses. The overcrowded beach and the numerous recreational fishing boats working the same school of fish or utilizing the same crowded reef are examples of such conflicts. These are particularly

concerned with the mixture of quantity and quality. Few who participate in a recreational activity would disagree, that as the number of participants within a limited space increases, the quality of the recreational experience to the individual decreases. From a management point of view this raises important questions about how to allocate resources and maximize recreational benefits. In other words, what is the optimal mix between the number of users and the individual and aggregate benefits created. Theoretically, if only one recreational user is using a given recreational environment, nobody infringes on the recreational experience and the benefit or value to the user is assumed to be the highest. With two parties sharing the site, the individual's benefit may decrease slightly, although the combined (aggregate) benefit in all likelihood will increase. The greater the number of users, the lower the individual benefits and the higher the aggregate benefits. This relationship will hold---up to a point. There are both variations and exceptions to this hypothesis: Some subgroups may favor crowds. Examples include teenagers and young adults seeking the company of others on the bathing beach; fishing vessels returning from a fishing tournament; and the festivities engaged in by competing sailboats after a hotly contested yacht race. The companionship is part of the recreational amenities sought by all groups which tends to complicate the responsibility of the manager and researcher.

SOLUTIONS & RECOMMENDATIONS

The paper suggests that many of the problems are associated with inadequate planning, and research efforts dealing with recreational problems especially in the marine environment. This in turn raises two additional questions. First, why and to whom is this information important? Second, what are the solutions to some of the potential problems outlined in the paper? Table 1 identifies the principal users in both the public and private sectors. Recreational water use is of critical importance to several federal agencies and departments with jurisdiction in the near and offshore marine environment. Identification of recreational vessels and those areas in which accidents (collision and groundings) are more likely to occur will be useful to the U.S. Coast Guard's Search and Rescue Effort (SAR) as well as an aid in identifying areas in need of new or additional navigational aids. The National Ocean Survey (NOS) is the federal agency responsible for editing existing navigational charts as well as developing new large scale charts which are especially suitable for the recreational boat owner. A great deal of discussion has addressed regulations dealing with Marine Sanitation Devices (toilets). At present, these require the elimination of raw sewage from both recreational and commercial vessels. It is fair to say that this regulation has been highly unpopular, very costly and difficult to implement, all reasons why the U.S. Coast Guard is attempting to have the coastal state take over the administration of this regulation. A final suggestion is to

UTILITY OF INFORMATION DEALING WITH MARINE RESOURCE USE

1 FEDERAL GOVERNMENT

- (A) SEARCH AND RESCUE (SAR)
- (B) NAVIGATIONAL AIDS
- (C) CHART MAKING
- (D) WATER QUALITY ANALYSIS (MSD)

2 STATE GOVERNMENT

- (A) COASTAL ZONE PLANNING
- (B) LOCATION OF:
 - PUBLIC MOORINGS
 - PUBLIC MARINAS
 - PUBLIC RAMPS
 - PUBLIC PUMP-OUT STATIONS
- (C) WATER SURFACE ZONING

3. PRIVATE SECTOR

- (A) LOCATION OF ONSHORE FACILITIES

Table 1

eliminate the regulation altogether. By knowing where recreational boats tend to congregate and correlate these with the physical nearshore oceanographic parameters (principally wind, wave and tidal effects), suitable compromises may be developed which will prevent further deterioration of the environment while not placing an unreasonable financial burden on the recreational public.

On and in the water research related to marine recreational usage will be of considerable importance to the coastal states especially those with approved coastal zone management plans. Identification of usage by different groups (fishing, diving, sailing, etc) will enable more efficient planning and management effort of existing state moorings, public marinas, ramps and pump-out facilities. The latter relates to the MSD problems discussed above.

Under certain circumstances the state and the U.S. Coast Guard have designated harborlines in which case some management controls will rest with the local community. Such local jurisdictional powers are commonly related to traffic control and are generally instituted to increase the safety of vessel traffic. Activities commonly regulated include most fishing activities and other in the water recreational activities (scuba, surfing and waterskiing). Other activities include anchoring and setting of speed limits, wake control etc. (Table 2, 3, & 4).

Although zoning as a planning mechanism has not yet moved offshore, the state has the right to control certain activities within the Territorial Sea as long as these do not inhibit the principle of "free and innocent passage." Several zoning mechanisms have been proposed for both the terrestrial and marine portion of the coastal zone. These may encompass time, space and activity zoning in addition to any combination of these. Briefly, time zoning refers to the elimination of certain activities at certain times during the day, week, or year. Space zoning calls for the prohibition of certain activities in specific area. In activity zoning, the specified activity is prohibited altogether.

Mention was made earlier that most of the research concerned with marine recreational problems has been topical. Such an approach is necessary when initially information about a given subject is limited or nearly absent. It is suggested that these conditions no longer exist. Outdoor recreational researchers, especially those who have addressed terrestrial (wilderness type) problems, have assembled an impressive body of literature dealing not only with the physical characteristics of outdoor recreational facilities but perhaps more importantly with the attitudes and perceptions of users (Shaefer, 1969, Ditton & Goodale, 1973; Tuan, 1973; Litton, 1974, Banerjee & Gollup, 1976), planners and managers (Goodchild 1974). Marine recreational managers and

	Pots	Long Line	Seine	Drage	Trawl	Day Sail	Rec. Fish.	Cruis.	Racing	Diving	Wat. Ski.	Tug Barge	Coastal	Light	Oil Platf.	Oil Pipel.
Pots	3	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1
Trap	2	3	2	2	2	1	1	1	1	1	1	1	1	1	0	0
Long Line	2	2	3	2	2	1	1	1	1	1	1	1	1	1	1	0
Seine	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	0
Drage	2	2	2	2	3	1	1	1	1	1	1	1	1	1	1	1
Trawl Day	2	2	2	2	3	1	1	1	1	1	1	1	1	1	1	0
Sail. Rec	1	1	1	1	1	3	2	2	2	2	2	1	1	1	1	0
Fish.	1	1	1	1	1	2	3	2	2	2	2	1	1	1	0	0
Cruis.	1	1	1	1	1	2	2	3	2	2	2	1	1	1	1	0
Racing	1	1	1	1	1	2	2	2	3	2	2	1	1	1	1	0
Diving	1	1	1	1	1	2	2	2	2	3	2	1	1	1	1	0
Wat. Ski	1	1	1	1	1	2	2	2	2	2	3	1	1	1	1	0
Tug	1	1	1	1	1	1	1	1	1	1	1	3	2	2	2	0
Barge	1	1	1	1	1	1	1	1	1	1	1	2	3	2	2	0
Coastal	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	0
Light	1	1	1	1	1	1	1	1	1	1	1	2	2	3	2	0
Platf	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	2
Oil Pipel.	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	3

0 No conflicts

1 Conflicts between user categories

2 Conflicts within user categories

3 Density related conflicts

POTENTIAL USER CONFLICTS WITHIN HARBORLINES

Commercial Fishing							Marine Recreation				Commercial Shipping & Energy Develop.						
	Pots	Trap	Long Line	Seine	Drag.	Trawl	Day Sail	Rec Fish	Cruis.	Racing	Diving	Water Skiing	Tug Barge	Coast.	Light.	Oil Platf.	Oil Pipe.
Day Sailing	1	0	0	0	0	0	3	2	2	0	0	0	1	1	1	0	0
Rec. Fish.	1	0	0	0	0	0	2	3	2	0	0	0	1	1	1	0	0
Cruising	1	0	0	0	0	0	2	2	3	0	0	0	1	1	1	0	0
Racing	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diving	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Skiing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 No Conflicts																	
1 Conflicts between user categories																	
2 Conflicts within user categories																	
3 Density related conflicts																	

0 No Conflicts
 1 Conflicts between user categories
 2 Conflicts within user categories
 3 Density related conflicts

Table 3

POTENTIAL USER CONFLICTS WITHIN INLAND WATERS

Commercial Fishing					Marine Recreation			Commercial Shipping & Energy Develop.											
	Pots	Trap	Long Line	Seine	Drag.	Trawl	Sail	ay	Rec. Fish	Cruis	Racing	Diving	Ski.	Wat.	Tug Barge	Coastal	Ligh.	Oil Platf.	Oil Pipel.
Day Sail.	1	1	1	1	1	1	1	3	2	2	2	2	2	2	1	1	1	1	0
Rec. Fish.	1	1	1	1	1	1	1	2	3	2	2	2	2	2	1	1	1	0	0
Cruis.	1	1	1	1	1	1	1	2	2	3	2	2	2	2	1	1	1	1	0
Racing	1	1	1	1	1	1	1	2	2	2	3	2	2	2	1	1	1	1	0
Diving	1	1	1	1	1	1	1	2	2	2	2	3	2	2	1	1	1	1	0
Wat. Skiing	1	1	1	1	1	1	1	2	2	2	2	2	2	3	1	1	1	1	0

0 No conflicts
 1 Conflicts between user categories
 2 Conflicts within user categories
 3 Density conflicts

Table 4

researchers need to relate to these studies to a greater extent than has been the case in the past. More importantly, we need to explore the symbiotic relationships which exist among different uses of the marine environment. While the topical approach may appear an efficient way of solving a particular problem, chances are that the identification of a recreational symbiosis will provide exciting opportunities for utilizing recreational resources in a more efficient and exciting way than has been the case in the past.

Incidentally, these opportunities are not limited to recreational activities alone. Industrial activities, whether the excavation of a city skyscraper or the on or offloading of a containership, provide unique perhaps exciting passive recreational opportunities which at the present time more often is lost. As researchers, planners and managers, we need to move away from the topical towards the multidimensional approach in planning for outdoor recreation. In short, we need to think about marine recreational systems which will benefit a much wider constituency than has been the case in the past.

LITERATURE CITED

- Anderson, F.J. and Bonsor, N.C. 1974. Allocation, Congestion, and the Valuation of Recreational Resources Land Economics, (Feb., 1974), Vol. 51, pp. 51-57.
- Anderson, S. H. 1980. The Role of Recreation in the Marine Environment. Ocean Yearbook, University of Chicago. Chicago.
- Ashton, P. G. and Chubb, M. 1972. A Preliminary Study for Evaluating the Capacity of Waters for Recreational Boating. Water Resources Bull. (June, 1982) Vol. 8, No. 3 pp. 571-577.
- Banerjee, T. and Gollub, J. 1976. The Public View of the Coast: Toward Aesthetic Indicators for Coastal Planning and Management. In P. Suefeld and J.A. Russel (eds.) Behavioral Basis for Design, Book 1 Selected Papers, Proc. 7th Int. Conf. of EDRA. Stroudsburg, PA.
- Bender, B. D. and Windsor, D.S. 1979. Marina Study: Marina Facilities Planning at Two Case Study Locations. URI. Kingston.
- Betty, M. 1975. Public Access to Beaches in the United States. Marine Affairs Journal 3, pp. 63-83.

- Bishop, D.W. and Aukerman, R. 1970. Water Quality Criteria for Selected Recreational Uses. Water Resources Center - University of Illinois. Urbana, Illinois.
- Brower, D. J. and Owens, D.W. 1976. Public Use of Coastal Beaches. Center for Urban and Regional Studies, UNC at Chapel Hill, NC Sea Grant. Chapel Hill, North Carolina
- Buckley, R. M. and Walton, J.M. Fishing Piers: Their Design and Use. Washington State Sea Grant Tech. Report WSG-81-1.
- Chaney, T. Coping with Boating Congestion in Maryland. Unpublished paper Maryland Dept. of Natural Resources, Coastal Zone Unit.
- Chmura, G. L. and Ross, N.W. 1978. The Environmental Impacts of Marinas and Their Boats. A Literature Review with Management Considerations. U.R.I. Marine Memorandum #45. Kingston, Rhode Island.
- Clark, J. et al. 1979. Small Seaports: Revitalization Through Conserving Heritage Resources. The Conservation Foundation. Washington, D.C.
- Cowey, A.B. 1979. The Urban Coast From a National Perspective. Coastal Zone Management Journal 2-3, pp. 135-163.
- Crandall, T. 1974. Shoreline Development Controls and Public Access to the Ocean's Edge. Coastal Zone Management Journal, 1, 4, pp. 451-466.
- David, L. 1971. Public Perceptions of Water Quality. Water Resource Research Vol. 7, No. 3 pp. 453-457.
- Dearinger, J.A. 1979. Measuring Preferences for Natural Landscapes. Journal of Urban Planning and Development Division, Proceedings of the American Society Civil Engineering, 105, 1, pp. 63-80.
- Ditton, R.B. and Goodale, T.H. 1973. Water Quality Perception and The Recreational Uses of Green Bay. American Geophysical Union - Water Resources Research, 9, 3, 569-579.
- Dix, G. 1979. Urban Waterfront Revitalization: A Review of the Literature. WASHU, Coastal Resources Program/Inst. for Marine studies and Dept. of Urban Planning. Seattle, Washington.

- Ducsik, D.W. 1974. Shoreline for the Public. A Handbook of Social, Economic and Legal Considerations Regarding Public Recreational Use of the Nation's Coastal Shoreline. M.I.T., Seagrant Program. Cambridge, Massachusetts.
- Firle, T.E. and Needham, M.V. 1980. Integrating Environmental Management with Port Planning. In TCS-6 Proceedings Utilization of Science in the Decision-Making Process TCS Annual Meeting, Holiday Inn, Embarcadero, San Diego. October 13-15, 1980.
- Freeman, B. Inventory and Atlas of Marine Sports Fishing Facilities. U.S. Dept. of Interior, Bureau of Sports Fishing and Wildlife. Highlands, New Jersey.
- Fridgen, J.D. Recreational Boat Owners' Response to Energy Constraints. Special Reprint #6, Agricultural Experiment Station, Michigan State University, East Lansing.
- Goodchild, B. 1974. Class Differences in Environmental Perception: an Exploratory Study. Urban Studies, Vol. 11, pp. 157-169.
- Gunn, C.A. et al. 1974. Development of Criteria for Evaluating Urban River Settings for Tourism-Recreation Use. Tech. Rep. #56, Texas Water Resources Institute, Texas A & M University. College Station.
- Harper, D.B. and Warbach, J.D. 1976. Visual Quality and the Coastal Zone Proceedings of a Conference/Workshop, May 29-30, 1975. SUNY, College of Environmental Science and Forestry. Syracuse, New York.
- Heatwole, C. Beach Use and Water Quality in New York City. Paper presented in support of N.Y.C. 208 program.
- Henley, R.J. 1967. Water Quality Influences on Outdoor Recreation in the Lake Ontario Basin. Proceedings 10th Conference Great Lakes Research, pp. 427-440.
- Lentnek, Barry et al. 1969. Spatial Behavior in Recreational Boating. Journal of Leisure Research, Vol. 1, No. 2, pp. 103-124.
- Lifton, F.B. 1966. Trends in Small Boating and Its Impact on Water Resources Development. Proceedings of the 2nd American Water Resources Conference, American Water Resources Association, pp. 182-186. Urbana, Illinois.
- Litton, R.B. 1974. Water and Landscape: An Aesthetic Overview of the Role of Water in the Landscape. Water Information Center.

- MacFarland, J.W. 1978. Beach Access, Coastal Islands and Recreational Resources. Shore and Beach, (Apr., 1978) 46, 2, 6-12.
- Maloney, Frank E. et al. 1977. Public Beach Access: A Guaranteed Place to Spread Your Towel. University of Florida Law Review, (1977), 29, 853-880. Florida Sea Grant.
- Matheusik, M.R.E. and Mills, A.S. Sport Divers and Their Preferred Coastal Setting. CZ83 Proceedings, pp. 1488-1506.
- Mann, R. 1973. Rivers in the City. Praeger. New York.
- McCloy, J.M. and Dodson, J.A. 1981. Guidelines for Establishing Open-Water Recreational Beach Standards. Proceedings of a Conference, April 16-18, 1981.
- Moore, A.C. and Childs, P.P., 1971. Bright, Breathing Edges of City Life. Office of Water Resources Research National Technology Information Service. Analysis III. Springfield, VA.
- Moss, M.L. 1976. The Urban Port: A Hidden Resource for the City and the Coastal Zone. Coastal Zone Management Journal, 2, 3, pp. 223-246.
- Nixon, D. 1978. Public Access to the Shoreline: The Rhode Island Example. Coastal Zone Management Journal, 4, 1.
- Owens, D.W. and Brower, D.J. 1976. Public Use of Coastal Beaches. University of North Carolina, Center for Urban and Regional Studies Sea Grant Pub. UNC-SG-76-08. Chapel Hill.
- Richardson, R.B. 1977. The Vagrant Ethic: Need for a Sea Lane Philosophy. Maritime Policy and Management, 4, 4, pp. 203-208.
- Robinson, G. 1979. Seaport Chic. Environmental Action.
- Rorholm, N. Boats and Their People: A Study of Rhode Island Boat Owners. Marine Tech. Report #52, University of Rhode Island, Kingston, Rhode Island.
- Seabloom, R.W. Bacteriological Effect of Small Boat Wastes on Small Harbors. University of Washington-Clearinghouse PB 187-270. Seattle.
- Shafer, E. L. et al. (1969) Natural Landscape Preferences: Predictive Model. Journal of Leisure Research, 1, 1 1-19.

Swim, D. Beach Access. CZ83, pp. 949-965.

Tuan, Yi-Fu. 1973. Ambiguity in Attitudes Toward Environment.
Annals, 63, 4, pp. 411-423.

Ward, G.D. and Cushman, M.M. 1967. Some Factors in Planning
for Marinas. Journal Waterways and Harbors Division
Proceedings, American Society of Civil Engineering (May,
1967), 93, WW2, pp. 203-212.

Warren, R. 1979. The Role of Cities in Managing the Urban
Coast. Coastal Zone Management Journal, 6, 2/3.

West, N. et al. 1982. Environmental Improvements on
Narragansett Bay as a Result of Section 312
Implementation of the Federal Water Pollution Control Act.
Coastal Zone Management Journal, 10, 1 & 2, pp. 125-140.

Wilman, E.A. 1978. Coastal Recreational Values and
Environmental Perturbations. Presented at MTS, Ocean '78
Conference, September 6-8, 1978, Washington, D.C.

THE USE OF A MULTIVARIATE TECHNIQUE IN THE DEVELOPMENT OF A MEASURE OF TOURISM

Cristanna M. Cook, Stephen D. Reiling, and William A. Halteman*

ABSTRACT.--Principal component analysis and common factor analysis were used to analyze fifteen secondary data variables that were hypothesized to be related to the level of recreation and tourism activity in Maine. The two techniques produced about the same results. The results indicate that the fifteen variables load on five different factors. Seven of the eight traffic data checkpoint variables load on a single factor, but other variables thought to be related to the level of tourism load on other factors. We conclude that none of the fifteen variables alone represent a good indicator to track tourism in Maine.

Additional keywords: Recreation and tourism, monitoring, indicators, principal component analysis, factor analysis, tracking tourism activity.

INTRODUCTION

Measures of Tourism and Recreational Activity

Recreation researchers are well aware of the lack of comprehensive studies to measure the economic impact of recreation and tourism. The expense and difficulty of obtaining the necessary data inhibits such efforts. The lack of primary data related to recreation and tourism expenditures is exacerbated by the shortage of secondary data. While economic indices exist to track the level of economic activity in many sectors of the economy (such as construction, steel, automobile, etc.), similar well defined indices do not exist for the recreation and tourism sector. The absence of such indices is due largely to the difficulty of defining a "tourist" and the fact that tourist expenditures are made primarily in the retail and service sectors of the economy. Hence, it is extremely difficult to separate tourist expenditures from normal household consumption expenditures. Comprehensive studies could be conducted to determine the percent of total sales of various retail and service sectors that are associated with recreation and tourism activities. These percentages could then act as weights in the development of a composite index of tourism. However, such studies are expensive and difficult to conduct.

An alternative to comprehensive studies would be to find existing data sources which might be considered indicators, if not indices, of tourism.

*Assistant Scientist and Lecturer, and Associate Professor, respectively, Department of Agricultural and Resource Economics, and Assistant Professor of Mathematics, Department of Mathematics, University of Maine at Orono.

Several possibilities exist at the state level. Food and lodging sales are among the most common. Travel activity levels (such as the number of air deplanements and highway traffic volume) is another source, along with state park camping and day use attendance records and employment levels in retail food and lodging establishments. Although such data sources may be possible indicators of tourism and recreational activity, a researcher may not have access to all of these indicators. In addition, there is little information on the efficacy of any one of these indicators as a measure of recreational activity and tourism.

Multivariate Techniques in Recreational and Tourism Research

As Kass and Tinsley have indicated, multivariate techniques in leisure research can be used to describe the relationship among variables as well as provide insight into the nature of this relationship (Kass and Tinsley: 1979). The nature of the leisure researcher's data will dictate the type of multivariate technique to be employed. If the researcher can separate the variables into explanatory (independent) and response (dependent) classes and, is interested in the relationships between these groups, then the analyses of choice ought to be from the regression/analysis of variance techniques. If, on the other hand, the researcher feels this distinction cannot be easily made, then the analysis (of the data) ought to employ the techniques of factor analysis, principal components analysis, or cluster analysis. The researcher need not have a clear understanding of all of the mathematical complexities underlying these techniques in order to utilize them. However, one must develop a decision framework to aid in the selection of the appropriate technique. This framework ought to include the types of questions answerable by each technique under consideration and the options/flexibility available in the form of existing computer programs. This paper provides a description of the framework used to select between the use of common factor analysis or principal components analysis. The decisions and questions are illustrated through the analysis of 15 possible indicators of tourism and recreational activity.

An Application of a Multivariate Technique

The term "factor analysis" is used in both a specific and a general context. In the general setting, factor analysis is used to denote the collection of factoring techniques among which the most frequently used are principal components analysis and common factor analysis. And specifically, it is used to refer, most often, to the technique common factor analysis. We will attempt to employ the adjective "common" to distinguish the two references.

Factor analysis is used when the object of the research is to understand interrelationships among a set of variables. As Tinter (1972) indicates, the logic for using multivariate techniques to analyze time series data is to find one measurement of some economic activity instead of tracking numerous indicators which are structurally the same. Monitoring of economic activity would be more efficient since perhaps only one time series indicator would be needed to represent the larger group of indices. Fifteen likely indicators

of recreational and tourism activity were collected and analyzed using both common factor and principal component analyses.

METHODOLOGY

Description of the Data

The data collected represents ten years of monthly information for each of 15 secondary sources. Specifically, one indicator consists of the number of cars that entered the Maine turnpike at the southern most point at York. The other travel data are the average daily number of cars that passed seven checkpoints on major tourist routes in Maine and air passenger deplanements from commercial airlines at Maine airports. The Bureau of Parks and Recreation records of day use attendance at all state parks as well as campground use data for the parks with campgrounds were also used. Sales data for the eating and drinking sector and the lodging sector, which are commonly used indicators of tourism and recreational activity, are included in the analysis. These sales were deflated by using the "food away from home" and "lodging while out of town" components of the consumer's price index, respectively. Levels of employment in the retail sectors of lodging and eating and drinking establishments are also included as variables.

These secondary data sources are considered to be more closely associated with recreation and tourism than other available secondary sources. It remains to be seen, if indeed, there is overall consistency among these data sets. The multivariate technique of factor analysis will indicate whether one major structural factor underlies these assumed tourism indicators and may be interpreted as an indicator of tourism and recreational activity.

The Tools of Factor Analysis

General concept: According to Nunnally, (1962) factor analysis is a very popular quantitative tool in the behavioral sciences. This popularity may attest to its potential usefulness in conceptualization. Factor analysis is not one statistical or mathematical method. It encompasses several approaches for conceptualizing groupings or clusters of variables and numerous mathematical procedures which derive the groupings or clusters.

The general purpose of factor techniques is to find a way of summarizing the variation contained in the original variables using a smaller group of components. Thus, the idea is to find several underlying constructs that will describe the original set of variables. The identified grouping may then be used in further research such as variables in regression analysis. They also may be used to replace the original set of variables in other multivariate techniques. Developing indicators and indices of recreational activity seems to be well suited to the use of this multivariate technique. The basic idea is to discern from existing variables some factor or factors which could act as a measure of recreational and tourist activity. It may also be possible to reduce the number of available indicators to one, which would save the expense of collecting data on several possible indicators. If several indicators provide virtually equivalent estimates of an underlying recreational factor, then

monitoring of only one factor would be appropriate. Also, a researcher with access to only one of several possible indicators of recreational activity would feel more secure in using that indicator as a monitor. Exploratory factor analysis will provide answers about which indicators cluster or group together and which do not.

The Decision Framework

Methods of factor analysis and factor extraction: The most common methods of analyzing the pattern among variables are the principal components and common factor techniques. Both techniques are directed at the variation exhibited by multiple observations made on many variables.

Principal components is a mathematical technique that rearranges the total variation in the data. Through the use of weighted combinations of the original variables this technique generates a new set of variables (called components) in which large pieces of the total variation are attributable to individual components rather than several of the original variables. In addition, the components are not correlated with each other.

This reallocation of variation permits the selection of a few components that account for the majority of the variation contained in many original variables. Therefore, this technique can be used as a way of reducing a complex data set to a more manageable size without appreciable loss of information (variation).

A secondary use of principal components is the identification of redundant information. The weights (called loadings or factor loadings) for the original variables can be examined to determine which variables have high weighting in the same component. Such variables are contributing the majority of their information (variation) to the same component and in that sense are supplying similar information.

Common factor analysis, on the other hand, is a statistical technique, which assumes a statistical model relating some unknown underlying factors and the observed data. The usual assumption is that the observed variables are linear functions of the factors with an error component that has a particular distribution.

The thrust of common factor analysis is information redundancy. In terms of variation, the model assumptions imply that the variance of a single variable has two facets; one attributable to the factors (called common variance) and a second that is due random error (called unique variance). The variance attributable to a factor may appear in several different variables, hence the name "common".

Common factor analysis uses a "communality" estimate or estimate of the common variation. Thurstone developed an early approach to finding communalities (Thurstone 1947). However, with this and more recent approaches such as minimum residual analysis (Harmon 1966; Comrey 1962), one must still provide, before the analysis, an assumption about the number of common fac-

tors. The researcher may have no clear hypothesis about the number of appropriate factors, so such methods that require this assumption are inappropriate. The maximum likelihood method of common factor analysis also requires an estimate of the number of common factors. It has a robust significance test for the extraction of each additional factor and can be used to make inferences from a sample to a larger population (Gorsuch 1974). Communality estimates are produced in the analysis.

Squared multiple correlations (SMCS) of each variable with all other variables are often used as estimates of communalities. However, SMCS tends to grow larger as the number of variables increase. This results from the possibility of an additional variable explaining another portion of each variable already in the analysis. Nunnally identifies additional difficulties with SMCS but goes on to say that if one insists upon using some communality estimate rather than using full variation component analysis, then SMCS are acceptable. In the full variation principal component model, total variation is used and there is no need for communalities. The principal component method can be used with communality estimates. In this situation, the same method is used to extract factors as in the full variation model, but common variation is used rather than total variation.

Which method to use to extract communality estimates is not a major issue (Nunnally 1967). All methods provide similar results. The maximum likelihood method, for instance, is more difficult to understand and very often yields no different factor pattern than the more easily understood methods. Whether to use a full principal component analysis, principal components with communalities, or some other common factor method depends upon: (1) whether the research is exploratory or hypothesis testing, and (2) whether the variation can be divided into common unique parts.

If the desire is to test hypotheses, then the inferential techniques of a maximum likelihood are appropriate. Minimum residual analysis as well as the maximum likelihood require a hypothesis about the number of common factors. Principal components with communalities and with total variation should be used when the research is exploratory and no specific number of components can be specified. This study used both full principal components and principal components with communalities since the intent was to explore and describe the relationship among the various indicators.

The selection of meaningful factors or components: There are three approaches to determine the number of significant factors: (1) statistical, (2) mathematical, and (3) percent of variation explained. The statistical approach is dependent upon the assumption of a multivariate normal distribution of the variables. When a factor has been extracted, statistical tests can decide if the residual matrix contains a significant amount of variance which could be removed through further analysis. A problem with this kind of selection is that the test is very dependent upon sample size. A large enough sample will allow meaningless factors to have significance.

According to Gorsuch, mathematically, the number of factors underlying any given correlation matrix is a function of its rank. The rank of a corre-

lation matrix is the number of linearly independent vectors that can be formed from the set. Estimating the rank of the correlation matrix is the same as estimating the number of factors. In a principal component analysis, the rank will equal the number of linearly independent variables. Thus, there may be as many factors as variables. In common factor analysis, the diagonals will contain variances less than unity. As a result, the number of factors will be less than the number of variables. In either case, Guttman has shown a way to differentiate significant and nonsignificant factors. Guttman's famous rule is to consider the number of extracted factors as significant where the characteristic roots of the matrix are > 1 as long as unities were used as variances (placed in diagonals of the original correlation matrix). With communalities, one takes all roots > 0 (Guttman 1954). This estimate provides a lower bound on the possible number of factors. With true communalities in the diagonals, the minimum rank of the matrix must be equal to or greater than the estimated number of factors.

A widely used approach to extracting nontrivial factors is the percent of variation extracted. In the component factor technique, the percent of total variance is calculated. With the common model, the percent of common variance is calculated. One then decides on the appropriate amount of cumulative variance to use as a cutoff criterion. A variation on this theme is to observe the graph of the value of the roots plotted against the number of factors. As the roots drop in value, it is clear an additional factor would explain very little new variance. This is called the scree test. Gorsuch recommends a combination of the above approaches (Gorsuch 1974).

The need for factor rotation: Rotation of factors provides essentially a linear combination of a linear combination. Rotation procedures are almost all variations of the "simple structure" developed by Thurstone (1947). The idea is to find factors which can be more easily understood. Two general techniques exist for the rotation of factors. One method assumes no correlation among the factors and is called orthogonormal rotation. The other allows factor correlation and is called oblique rotation. If there is no reason to assume correlated factors, then the orthogonormal technique should be used. The actual procedure of rotation can be one of several. However, Nunnally strongly suggests the varimax rotation (Nunnally 1967). If the factor structure before rotation is clear and meaningful, there is no need to perform this additional step.

The appropriateness of the factor method: Armstrong and Soelberg (1968) showed significant factor loadings with variables randomly selected. Thus, it is possible to find significant factors when in reality, no such factors could be postulated by theory. Although it is unlikely that a researcher would include a variable which would have no possible theoretical connection with one or more of the other variables, it would be desirable to have a technique for testing the efficacy of the correlation table usually used as input in the factor analysis. The Bartlett test is one such technique (Bartlett 1950). Other techniques also exist (Kaiser 1970; Kaiser and Rice 1974). Knapp and Swoyer (1967) have found Bartlett's test to be robust. Tobias and Carleson (1969) applied this method to randomly selected data and failed to reject the hypothesis of independence. Thus, if this method was used before the factor

analysis, one would know if the method is inappropriate. A good discussion of the Bartlett test can be found in Tinsley (1979), Bartlett (1950), and Dziuban and Shirkey (1974). The Bartlett statistic has a Chi-square distribution and can be computed as follows:

$$X^2 = - (n - 1 - \frac{2v + 5}{6}) \log_2 |R| \quad df = v(v - 1)/2$$

$|R|$ = determinant of the correlation matrix

v = number of variables

n = number of subjects

The determinant of the correlation matrix is simply the product of the eigenvalues produced from a principal component analysis of the correlation matrix. An eigenvalue is the product of the sums of squares of the factor loadings of each variable on a factor. The determinant, of course, would normally be found and the X^2 statistic calculated before factor analysis is performed.

Calculations of the Bartlett statistic does not require assumptions about the population distribution such as normality of the distribution. Thus, we can compare distributions upon which the correlations are based without specifying their form. For this study, the deseasonalized and detrended data subjected to the Bartlett criterion were significant, signifying that factor analysis is an appropriate technique.

Assumptions and Limitations

There is disagreement in the literature on the appropriateness of the assumptions of linearity, normality, and homoscedasticity of the error terms of the data from which a correlation coefficient is calculated (Binder 1959). Since the normal procedure is to use correlational data as input to the factor analysis, (both common and principal component), it is important to know how violation of the above assumptions will affect interpretation of results. It is not necessary to make the assumptions of normality, linearity or homoscedasticity when one does not wish to make some kind of confidence statements. If one wishes to look at the percent of variance explained by the correlation of one variable with another, then the relationship is not dependent upon normality, linearity, or homoscedasticity (Mulholland 1958).

However, the advantage to common factor analysis is that if the above assumptions are indeed valid, then statistical statements may be made about the underlying population from which the observed data were sampled. With principal components there is no such capability since the method does not presume a model or sampling framework.

Little agreement exists on the appropriate number of observations for an analysis. Several noted researchers indicate a large sample size is preferable to a small. The sample size is considered acceptable if the number

of observations is 10 times the number of variables (Nunnally 1967). It is not recommended to perform factor analysis on small samples (Cattell 1978). In a small sample, errors of measurement can be correlated and can appear as substantial factors. This is the primary problem encountered with small samples.

Standardization of variables: In multivariate methods of analysis, the relative size of the deviation of the variable values from their mean are the data of importance. Absolute values are not needed and moreover, not desirable. The standardized variables measured as deviations of the variable values from their respective means and subsequently divided by the standard deviations are desirable. It is usual to use the correlation matrix of the variables as input to a factor analysis. When the product-moment correlation matrix is calculated, the cross product is divided by the standard deviations. As a result, standardization is assured. Several other reasons exist for the use of the correlation matrix. Nunnally says that the correlation matrix is very useful in determining the signs and sizes of coefficients of linear combinations. Also, since each factor is a linear combination of all the variables, the correlation of any variable with a factor can be obtained if the correlation matrix is used as input. The present study uses the correlation matrix as input.

Time Series Data in Factor Analysis

The effect of measurement error on the underlying factor structure has been mentioned. An additional problem is the possibility of serial correlation, specifically autocorrelation. Autocorrelation does influence the magnitude of the variance of an estimator. This in turn will affect any tests of significance. The problem has been briefly discussed, although no suggestions of how to deal with this problem in the factor analysis were made (Tinter 1946; Anderson 1963). To assess whether one's variables are autocorrelated, one must postulate a model described in terms of independent and dependent variables. Since factor analysis assumes no dependent-independent dichotomy among the variables, postulating a specific model is not what one intends to do in the first place. The actual effect of autocorrelation on a factor structure is not well described. However, one should consider carefully the results from test of significance used in factor analysis when time series data are used. The autocorrelation may mask the degree of correlation among variables. Another effect of this kind of error would be to increase the rank of a matrix which would result from the correlation of the error terms. A factor would appear which would reflect the variation due to this specific error factor. Carroll has pointed out that systematic errors do increase the rank of a matrix (Carroll 1961).

RESULTS

The 15 variables described above were analyzed using both principal component and common factor analysis with SMCS used as estimates of common variation (Harman 1966; Comrey 1962; Nunnally 1967). As Cattell and Gorsuch have indicated, different techniques will often produce the same factor structure. The same underlying pattern was found among the 15 indicators using

both the full model and principal components with SMCS as estimates of communalities.

Both techniques were applied to two sets of data: the original data, and deseasonalized and detrended data. It was hoped that deseasonalizing and detrending would remove problems resulting from all the variables being correlated with time. Tinter (1963) suggests detrending and deseasonalizing the data before conducting the principal component analysis. The fifteen variables in the data set were detrended and deseasonalized using the X-11 program developed by the Bureau of the Census and incorporated in the SAS statistical package.

The Factor Patterns

Since the results obtained from the principal components and the common factor technique with SMCS used to estimate communalities were the same, only the results of the principal components analysis will be presented. Table 1 contains the unrotated factor structure obtained from the original data. Both the Guttman and the percent of variance explained criteria point to two prominent factors. The Kingfield checkpoint and deplanements load high on factor two (.57 and .63, respectively) while all other variables load high on factor one. Deplanements also load high on factor one.

Each factor loading can be interpreted as a product moment correlation coefficient. The square of the factor loading is the amount of variable variance explained by that factor. For example, factor one explains 98 percent (.99²) of the variance in the York checkpoint data. The sum of the squares of the correlations of all variables on one factor represents the eigenvalue or characteristic root of that factor. With the principal component technique, the eigenvalues will sum to total variance (which is equal to the number of linearly independent variables). Thus, it is possible to calculate the percentage of total variance explained by each factor by dividing the eigenvalue by total variance. For instance, factor one explains 81 percent (12.21/15) of the variation in the fifteen variables. For a given variable, the sum of squares of the correlation of the variable over all factors gives the amount of variance in that variable that is explained by all the derived factors. For example, 99 percent (.99² + -.03²) of the variation in the York checkpoint data is explained by the two prominent factors in Table 1.

Given the results reported in Table 1, it is tempting to interpret factor one as the "travel/tourism" factor and conclude that all but one of the variables (namely the Kingfield checkpoint) could serve as a good indicator of travel and tourism. However, we are not convinced that such an interpretation and conclusion are warranted. Since the data used in the analysis have not been corrected for seasonal, cyclical or trend variations, an alternative interpretation is that factor one accounts for the relationship between the variables and time. Investigation of the original data indicates that most of the variables exhibit very strong seasonal variation and significant trends with respect to time. Therefore, we believe that factor one is showing the effects of time on the variables. This interpretation can also be used to

TABLE 1

Unrotated Prominent Factor Structure Obtained from the Original Data

Indicators	Factor Loadings		Percent Variance Explained in Variables by All Prominent Factors
	Factor 1	Factor 2	
<u>Checkpoints</u>			
York	.99	-.03	99
Ellsworth	.96	-.15	94
Boothbay	.99	-.11	99
Yarmouth	.89	.42	97
Ogunquit	.99	-.10	99
Dedham	.99	-.09	99
Rockland	.97	-.10	95
Kingfield	.03	.57	33
<u>Employment</u>			
Lodging	.99	-.14	99
Restaurant	.81	.43	85
<u>Sales</u>			
Lodging	.92	-.26	92
Restaurant	.99	-.03	98
<u>State Park</u>			
Day Use	.95	-.16	93
Camping	.93	-.24	93
<u>Other</u>			
Deplanements	.67	.62	83
Eigenvalues	12.21	1.32	
Total 13.53			
Variance Explained			
Across All Variables			
(Percent)	81	9	
Total 90			

explain why the Kingfield traffic variable and the deplanement variable load high on a second factor. Both of these variables exhibit seasonal and trend patterns that differ significantly from the other variables. Hence, we can not draw any conclusion regarding the usefulness of the fifteen variables as an indicator of tourism from the analysis reported in Table 1.

The results of the principal components analysis performed using the deseasonalized and detrended data are reported in Table 2. A total of five factors have eigenvalues greater than one and the five factors explain 60 percent of the variation in the fifteen variables. All of the traffic checkpoint data (with the exception of Kingfield) and restaurant sales and employment load highly on factor 1. The Kingfield traffic pattern and lodging sales and employment load on factor 2 while state park day use and camping use load highest on factors 3 and 4, respectively. Deplanements loads very high on factor 5. Clearly the factor loading pattern obtained from the deseasonalized and detrended data is quite different than that obtained from the original data.

The results reported in Table 2 are obviously more difficult to interpret in terms of their implications for identifying a variable to monitor recreation and tourism. Factor 1 may reflect the general level of travel in Maine, including both tourist and non-tourist travel. Seven of the eight traffic checkpoint data and restaurant sales appear to be good indicators of this factor. The second factor may also be related to tourism because of the high loading of lodging sales and employment on this factor and perceived importance of lodging to recreation and tourism activities in Maine. This accounts for the variation from those travelers who use commercial lodging facilities. On the other hand, neither state park day use nor camping attendance load highly on factors 1 or 2 as they do on other factors. This is somewhat surprising since state park usage data are a direct indicator of activity associated with one segment or component of recreation and tourism. One could hypothesize that state park attendance may parallel the level of activity in other types of tourism activity. This reasoning would suggest that factor four would be related to recreation and tourism but measuring the outdoor activity component.

An alternative interpretation of the results is that factor 1 represents general summer travel in Maine, including tourist travel, while factor 2 reflects winter travel and tourism patterns. This interpretation is based on the fact that all variables except lodging sales and Kingfield traffic patterns load on factor 1 at the .2 level or higher, thus indicating that some of the variation in all the variables is explained by summer tourism. Factor 2 may reflect winter tourism because of the high loading of the Kingfield traffic pattern on this factor. This checkpoint is located on the primary route to the largest ski resort in Maine. The very low loading factors for coastal traffic checkpoints (Boothbay, Yarmouth, Ogunquit and Rockland) on factor 2 is consistent with the general observation that little tourist activity takes place in the coastal area during the winter. This interpretation would suggest that lodging sales would be a good indicator of winter tourism but not summer tourism. This is inconsistent with the perception that overnight accommodations is an important component of Maine summer and winter tourism.

TABLE 2

Non Rotated Factor Structure: Deseasonalized and Detrended Data

	Factor Loadings					Percent Variance Explained in Variables By All Prominent Factors
Indicators	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	
<u>Checkpoints</u>						
York	.71	.09	.01	.15	.02	54
Ellsworth	.67	.16	-.06	.19	-.20	56
Boothbay	.68	.03	.11	-.30	-.15	57
Yarmouth	.74	-.03	-.14	-.25	-.09	64
Ogunquit	.60	-.11	.21	-.35	-.26	61
Dedham	.65	-.28	.25	-.09	.18	61
Rockland	.64	.01	-.29	-.03	.10	51
Kingfield	.06	.69	.33	.16	.02	63
<u>Employment</u>						
Lodging	.19	.53	-.45	.29	.11	61
Restaurant	.45	.08	-.56	-.07	.17	55
<u>Sales</u>						
Lodging	.09	.71	.29	-.25	.13	67
Restaurant	.62	.00	-.01	.35	-.14	53
<u>State Park</u>						
Day Use	.44	-.05	.53	.42	-.01	65
Camping	.21	-.18	-.01	.53	.34	47
<u>Other</u>						
Deplanements	.21	.11	.17	-.26	.83	86
Eigenvalues	4.08	1.48	1.26	1.14	1.06	
Total 9.66						
Variance						
Explained Across All Variables (Percent)	27	10	8	8	7	
Total 60						

However, the 1972 study of tourism in Maine (A.D. Little, 1974) indicates that 52 percent of the nights spent in Maine by tourists were spent in the houses of friends and relatives or in the seasonal home of the owner, rather than in commercial lodging facilities. On the other hand, the level of expenditures made by overnight tourists who use commercial facilities are much higher than those made by day trippers and people who stay overnight in noncommercial establishments. Hence, the economic impact of tourism may be more closely related to activity in the commercial lodging sector than to noncommercial lodging.

We can draw some tentative conclusions from the analysis presented in Table 2. First, we believe that the level of highway travel is an indicator that should be considered in monitoring tourism. The analysis suggests monitoring one traffic checkpoint, such as York, provides a good indication of the level of traffic flow on other major tourist routes. It also provides a good indication of restaurant sales. Second, monitoring of lodging sales also is important since commercial lodging is used by almost one-half of overnight travelers and this group of travelers has a higher level of expenditures than other groups of tourists. Finally, monitoring of state park use may be useful for monitoring the level of activity associated with that component of tourism. However, the state park data may not be a good indicator of what is happening to other types of tourist activities.

In summary, we do not believe that any one of the variables, by itself, can be used as an indicator of recreation and tourism. Given the nonhomogeneous nature of the activities that comprise tourism, perhaps one should not expect that any single variable would serve as a useful indicator of tourism. We believe that more investigation is required before a set of variables can be identified that can be used to indicate the level of activity associated with recreation and tourism in Maine and recreation and tourism in general.

BIBLIOGRAPHY

- Anderson, T.W. 1963. The Use of Factor Analysis in the Statistical Analysis of Multiple Time Series. Psychometrika. 28:pp. 1-23.
- Armstrong, J.S. and Soelberg, P. 1968. On the Interpretation of Factor Analysis. Psychological Bulletin. 70:361-364.
- Bartlett, M.S. 1950. Test of Significance in Factor Analyses. British Journal of Mathematical and Statistical Psychology. 3:77-85.
- Binder, Arnold. 1959. Considerations of the Place of Assumptions in Correlational Analyses. American Psychologist. 14:1959.
- Bureau of the Census. U.S. Department of Commerce. 1965. The X-11 Variant of the Census Method II Seasonal Adjustment Program. Technical Paper No. 15.
- Carroll, John B. 1961. The Nature of the Data, or How to Choose a Correlation Coefficient. Psychometrika. 26:347-372.
- Cattell, Raymond B. 1978. The Scientific Use of Factor Analysis in Behavioral and Life Sciences. New York:Plenum Press.
- Cattell, Raymond B. 1952. The Three Basic Factors - Analytic Research Designs - Their Interrelations and Derivatives. Psychological Bulletin. 49:499-521.
- Comrey, A.L. 1962. The Minimum Residual Method of Factor Analyses. Psychological Reports. 11:15-18.
- Dziuban, C.D. and Shirkey, E.C. 1974. When is a Correlation Matrix Appropriate for Factor Analyses? Some Decision Rules. Psychological Bulletin. 81:358-361.
- Gorsuch, Richard L. 1974. Factor Analysis. Philadelphia: W.B. Saunders Company.
- Guttman, L. 1954. Some Necessary Conditions for Common Factor Analyses. Psychometrika. 19:149-161.
- Harman, H.H. and Jones, W.H. 1966. Factor Analyses by Minimizing Residuals. Psychometrika. 31:351-368.
- Kaiser, H.F. 1970. A Second Generation Little Jiffy. Psychometrika. 35:401-416..
- Kaiser, H.F. and Rice, John. 1974. Little Jiffy, Mark IV. Educational and Psychological Measurement. 34:111-117.

- Kass, Richard A. and Tinsley, Howard E.A. 1979. Factor Analyses. Journal of Leisure Research. 11:122.
- Knapp, T.R. and Swoyer, V.H. 1967. Some Empirical Results Concerning the Power of Bartlett's Test of Significance of a Correlation Matrix. American Educational Research Journal. 4:13-17.
- Miltholland, John E. 1958. Comment on "The Needless Assumption of Normality in Pearson's R." American Psychologist. 13:544-545.
- Northeast Markets, Inc. 1974. Tourism in Maine. Report to the Maine Vacation Travel Analysis Committee. 208 pp.
- Nunnally, J.C. 1967. Psychometric Theory. New York:McGraw-Hill Book Company.
- Thurstone, L.L. Multiple Factor Analysis. Chicago: University of Chicago Press.
- Tinter, Gerhard. 1952. Econometrics. pp. 109-114.
- Tinter, Gerhard. 1946. Some Applications of Multivariate Analysis to Economic Data. Journal of the American Statistical Association. 41:pp.472-500.
- Tobias, S. and Carleson, J.E. 1969. Brief Report: Bartlett's Test of Sphericity and Chance Findings in Factor Analysis. Multivariate Behavior Research. 4:375-377.

STATE PARKS AND RESIDENTIAL PROPERTY VALUES IN NEW YORK¹

Tommy L. Brown and Nancy A. Connelly
Department of Natural Resources
Cornell University
Ithaca, New York 14853

Abstract.--The effect of state parks on surrounding residential property taxes was examined for six communities in New York, ranging from metropolitan suburban to rural. Proximity of property to state parks was found to be associated with a higher selling price of residential properties in two of the six communities, both villages with surrounding rural land. These property value impacts occur incidentally to the primary mission of state parks, which makes it difficult to generalize or predict situations where such effects can be expected.

Additional keywords: Real estate, recreation, economic impacts.

Previous studies of the economic values associated with state parks indicate that the two largest such values are the local economic impacts resulting from (1) tourist visitation and their associated expenditures (Brown et al. 1983; Dean et al. 1978) and (2) state expenditures (i.e., wages paid to local residents employed, purchase of other local goods and supplies) made in conjunction with maintaining and operating parks. A third type of local economic value potentially associated with state parks is their effect on surrounding property values. The literature on relationships between state parks and surrounding property values (primarily residential property ranging from suburban to rural) is sparse.

Most previous studies that have examined relationships between parks and property values have done so with city or neighborhood parks in an urban setting. Weicher and Zerbst (1973) found positive externalities generated for Columbus, Ohio residential properties where the house faced a neighborhood park, no externality for properties where houses backed onto the park, and negative externalities for properties adjacent to one park that faced heavily used recreational facilities. Separate dummy variables were used to reflect the three property location categories relative to the parks.

Hagerty et al. (1982) used a similar hedonic pricing technique to measure the component of housing prices attributable to proximity to city parks in Worcester, MA. However, they included a distance function from the property to the parks, and were therefore able to derive an aggregate estimate of incremental residential property value attributable to the parks. Using principal components regression, the authors found that a house located 20 feet from the parks studied sold for \$2,675 more than for a house 2,000 feet from the park, with 80 percent of the externality being lost after a distance

This work was funded jointly by Cooperative Regional Project NE-137 through J.S. Hatch Act Funds, by the U.S. Forest Service, and by the New York State Office of Parks and Recreation.

of 500 feet from the park. Similarly, Correll et al. (1978) found an inverse relationship between the price of residential property and distance of the property from greenbelts in Boulder, CO, at the linear rate of \$4.20 per foot, extending for 3,200 feet.

State parks are typically established to meet recreational and other needs on a statewide or regional basis. Many states also use their state parks as an integral part of tourism promotion. Thus, state parks are not typically established and operated primarily to provide benefits to local residents. Nevertheless, in some situations, notable benefits are provided to local residents. In two other studies of local impacts of state parks (Dean et al. 1978; Cohee et al. 1976) the effects of parks on property values was not investigated, although Cohee et al. did examine the negative value components associated with the values of production and local taxes forgone as a result of the creation of state parks in Kentucky.

Because state parks are not established primarily to provide local recreational benefits, it is likely that some parks will provide such benefits to the extent that they are reflected in property values, while other parks will not. A report produced for the Canadian Federal/Provincial Parks Conference (Canadian Outdoor Recreation Research Committee 1975) indicated that land values increased dramatically in the neighborhood of one park and historic settlement, while they showed no impact in a second area. This report concluded that the factors contributing to this effect have not been well explored, and that further investigation is needed.

Although one such further study can not hope to provide comprehensive answers, this New York study was initiated in part to provide further insight into those situations in which state parks enhance local land values, and those in which they do not. Six state parks were examined, five of which are located in proximity to villages or cities, and the sixth in proximity to two seasonal settlements.

THE STUDY AREAS

The state parks and associated communities studied are described in brief below, in order of population, from metropolitan suburban to rural. The locations are also shown in Figure 1.

Green Lakes State Park is in the suburban Syracuse area (1980 urbanized population of 180,013). A park of 1,103 acres in a rolling topography of woods and lakes, the park offers ample opportunities for hiking, biking, picnicking, fishing, camping, swimming, and golf.

Saratoga Spa State Park is located approximately 30 miles north of Albany, near the city limits of Saratoga Springs (1980 urbanized population of 13,066). The park complex, which covers about 2,000 acres, contains bathing spas, a performing arts center, picnicking, and golf facilities.

Cumberland Bay State Park, in northeastern New York, lies adjacent to the city of Plattsburgh (1980 urbanized population of 11,559). The park contains 350 acres on Lake Champlain, and provides swimming, fishing, camping and picnicking opportunities.

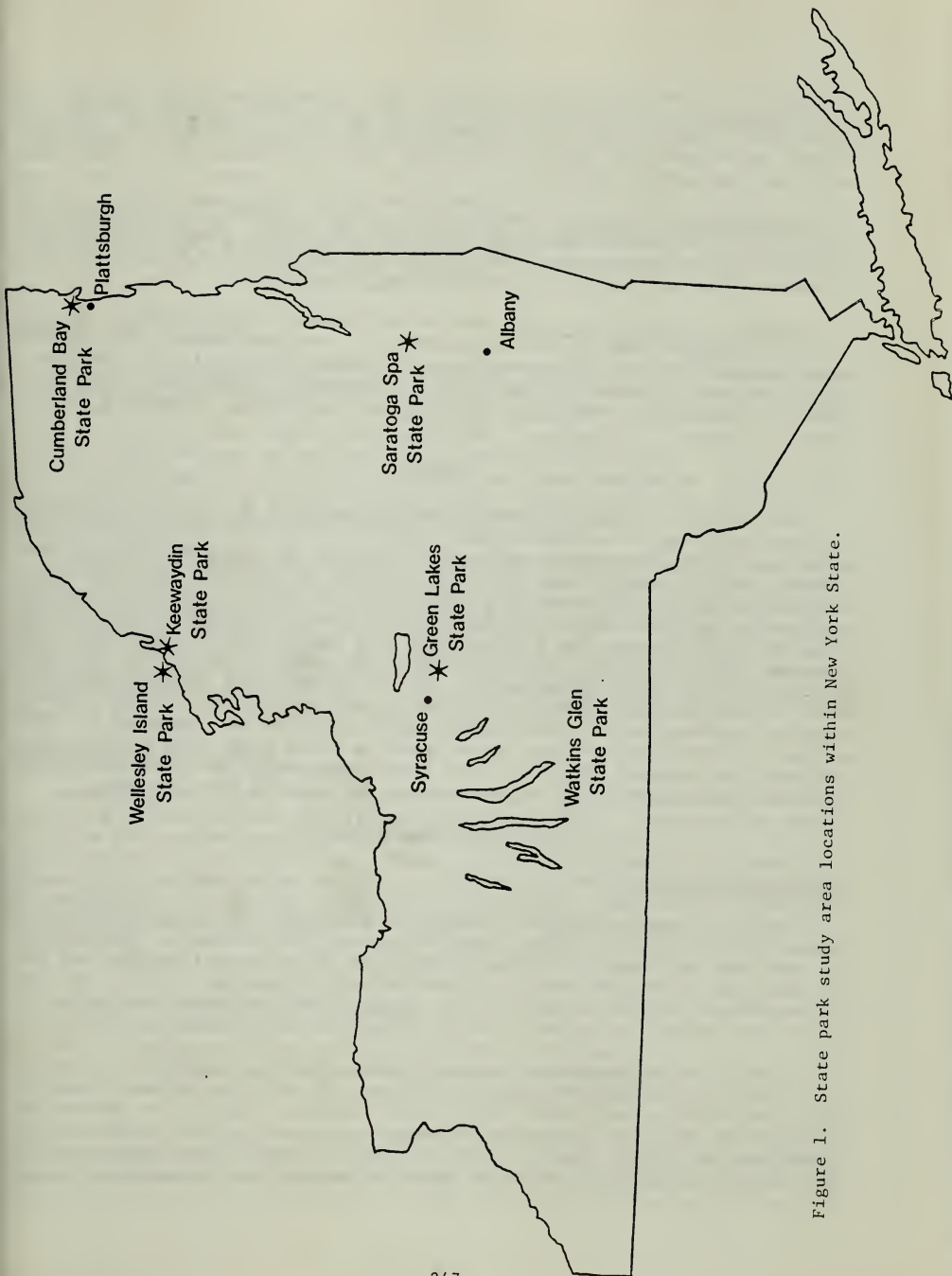


Figure 1. State park study area locations within New York State.

Watkins Glen State Park is entered from the center of the village of Watkins Glen (1980 population of 2,440), in New York's Finger Lakes region. The park of 668 acres of spectacular gorges offers hiking, camping, swimming, and picnicking opportunities.

Keewaydin State Park, in the Thousand Islands region, lies adjacent to the village of Alexandria Bay (1980 population of 1,265). This 180 acre park provides a marina and access to the St. Lawrence River for any form of aquatic recreation. The park also has picnicking facilities.

Wellesley Island State Park, also in the Thousand Islands region, is the only park examined that is not adjacent to a populated area. This large recreation complex of 2,636 acres lies on a large island in the St. Lawrence River that also contains two settlements of seasonal residences. The park offers a full range of camping, picnicking, golf, swimming, and boating facilities.

METHODS

Many counties in New York keep a computerized file of residential property sales according to a standardized format. This file includes the sale price as well as the assessed value, and a number of characteristics of the property and residential dwelling (e.g., number of bedrooms and bathrooms, type of heating). These tapes were obtained for counties or adjacent municipalities in which the parks of interest were located. By using tax maps and topographic (USGS) maps, the distance from each park of properties having sold in recent years (1974-1982) was estimated to the nearest 100 feet for all such properties lying within 10 miles of a park. The distance variable was then added to other property and housing data as an independent variable. After examining scatterplots of relationships between sale price (converted to 1982 constant dollars) and distance to the park, multiple regression analysis was performed for distance intervals where there appeared to be a possible relationship between sales price and distance of the property from the park.

RESULTS AND INTERPRETATION

Green Lakes State Park

Data were examined for 60 residential property sales ranging from distances of 1.4 miles to 4.7 miles from the nearest park entrance. Distance to the park was not significantly correlated with sales price ($r = -.05$), and did not enter the regression model at a statistically significant level. For the 60 properties, the three statistically significant independent variables of square feet, rooms, and number of baths produced a model having an r^2 of 0.74.

An examination of the data suggested the possible influence of proximity of the park and selling price for a distance of up to two miles. However, only nine property sales were within that distance. These nine properties showed a high negative correlation between distance and selling price ($r = -.77$; significant at $P = .02$). However, when the housing characteristics listed above were controlled for, the significant negative correlation was removed.

Study findings were discussed with staff of the Central New York Regional Planning and Development Board, and several hypothetical explanations were developed for the lack of a distance-selling price relationship. First, the land immediately surrounding Green Lakes is in mixed rural land uses, such that intense development in the immediate proximity of the Park is lacking. Second, the 60 properties studied are primarily suburban, with half-acre lots and a mean adjusted 1982 selling price of \$72,600. Many of the homes in these suburban areas have backyard pools or other amenities such that a closer location to a park is not sufficiently important to affect the selling price over and above acreage and housing characteristics.

Saratoga Spa State Park

As was true of Green Lakes, the proximity of properties to Saratoga Spa State Park did not significantly affect their selling price. The best explanatory model, which incorporated acreage, age, square feet, and number of bathrooms as statistically significant variables, produced an r square of .72. Distance from the park and selling price were not significantly correlated for any distance segment. A total of 84 properties were examined at distances of from 2,000 feet to 7.5 miles from the park. These properties averaged one acre in size and a 1982 adjusted selling price of \$63,000.

Saratoga Spa State Park is also surrounded by lands that are primarily rural. Thus, the residences closest to the park have large lots, which lessens the demand of residents for being near a park. The northern end of the park, nearest to Saratoga Springs, is the area where the hotel and performing arts center is located. This area is congested at times of major events, which may well negate being located near it. Furthermore, there are several neighborhood parks and playgrounds in Saratoga Springs where local residents can enjoy some of the activities they would otherwise use the park for.

Cumberland Bay State Park

Cumberland Bay State Park, which is located about a mile northeast of Plattsburgh, lies between the city and Cumberland Head, a peninsula of about 2.5 miles that extends south into Lake Champlain. An analysis of all property sales ranging from .25 mile to 5.5 miles from the Park showed no influence of proximity to the Park to the selling price of 68 residences. A further separate examination of the 38 properties on Cumberland Head showed a positive relationship between selling price and distance from the park:

$$Y = -14,157 + 30F + 103D + 12,525W + 25,449P$$

where Y = selling price in dollars

F = number of square feet

D = distance from the park in hundreds of feet

W = a dummy variable reflecting waterfront property

P = a dummy variable reflecting permanent residences

This model has an r square of .84. However, it would be erroneous to conclude that the lower property values nearer the park are attributable to the park. Toward the southern end of Cumberland Head (most distant from the park), the aesthetics (lake overlooks, views) are considerably more pleasing than on the

northern end. Thus, we believe that the distance variable reflects distance from the southern end of the peninsula rather than distance from the state park.

Property values in the northeastern part of Plattsburgh, nearest the park, are probably not enhanced by the park because residents use a municipal beach and other park facilities much more than the state park. Much of the park use is by Canadians. Furthermore, the park does not immediately border the city.

Watkins Glen State Park

The Village of Watkins Glen, which lies at the southern tip of Seneca Lake, is sufficiently small that it has a very limited number of residences that could be classified as suburban. Most properties outside the village are rural in character.

A total of 31 residential properties were examined, 20 of which were within the village limits. Distances between the properties and the state park ranged from .2 mile to almost 8 miles. Fifteen residences were on the village water line; the others had well water, except for one residence that had no source of water. Six of the rural properties had acreage ranging from 5 to 82 acres. The mean adjusted 1982 sales price of the 31 residences was \$44,924.

Although the simple correlation between selling price and distance to the park was low (.143), when the number of stories and square feet of residences were controlled for along with the type of water supply, distance became significant (partial correlation of -.210) and entered the regression equation. The best equation found was:

$$Y = 39,186 - 18,239S - 20F - 50D + 17,374P$$

where Y = selling price

S = number of stories

F = square feet

D = distance

P = dummy variable indicating private water supply

Each of the independent variables and the model as a whole have F statistics and standard errors significant at $p=.05$. The number of stories had a negative coefficient in the model because the variable was closely correlated with age of the structure ($r=.81$). The model had an r^2 of .73.

The model suggests that on average, for the distance of residences in the model (.2 to approximately 8 miles) that for each 100 feet closer a residence is to the park, its selling price increased by about \$50. The primary alternative hypothesis examined was that property within the village limits had a higher selling price, other factors held constant, than property outside the village limits. Such a dummy variable proved not to be statistically significant, however. It is possible that residential prices increase outside the village due to proximity to the village limits, for shopping and work convenience and a variety of other reasons. However, the state park is very much

part of the character of Watkins Glen, it does receive local use, and because the model showed distance to be correlated with selling price both inside and outside the village, the model is accepted as reflecting a positive influence of the park on surrounding property values.

Keewaydin State Park

A similar regression model for Keewaydin State Park also showed distance to the park to be significantly correlated with the sales price:

$$Y = 45,661 + 6,604Ac - 324Ag + 15,538S + 11F - 31,379P - 72D$$

where Y = selling price

Ac = acres

Ag = age

S = number of stories

F = square feet

P = a dummy variable reflecting permanent residences

D = distance from the park in hundreds of feet

This model has an r^2 of .613, and all independent variables have F statistics that are significant at $P=.05$.

This park receives some local use for picnicking, but its primary value to local residents is believed to be its marina and boat launching area. These facilities provide residents access to the St. Lawrence River for fishing and other water recreation activities.

Wellesley Island State Park

The best regression model for Wellesley Island incorporated the independent variables of public water supply, acreage, square feet, degree of central heating, and whether or not the property is on the waterfront. This model was statistically significant at $P=.03$, and explained 54% of the variance in selling price. Distance to the park was not significant.

Most of the properties on the island are waterfront properties, and most have access to the St. Lawrence River. The primary facility provided by the park of interest to local residents is the golf course. Apparently proximity to the golf course was not a sufficient amenity that it affected the selling price of residences. Most seasonal properties on the island are within two miles of the golf course.

ESTIMATING THE ECONOMIC IMPACTS OF PROXIMITY OF RESIDENCE TO A STATE PARK

Watkins Glen and Keewaydin State Parks were found to affect the selling price of surrounding residential properties. The impact of the park on local property values will be illustrated for Keewaydin State Park. In expanding the distance factor of \$72 per 100 feet to arrive at a total estimate of incremental property values attributable to proximity to Keewaydin State Park, the assumption was made that the distance factor also applies to other properties not sold. For properties which have not recently sold, no sale price was available, and assessed value was used instead. The assumption was then made

that the influence of distance to the park on assessed valuation is the same as upon sales price for properties sold. That is,

$$\frac{\text{Total assessed value}}{\text{Total sales value}} = \frac{\text{Total enhanced assessed value}}{\text{Total enhances sales value}}$$

The nearest sale property to Keewaydin was 4,600 feet from the park entrance. Because we had no data to confirm that the linear distance/valuation factor holds for distances closer to the park than this, closer properties were not included in the estimate of incremental property values. This was equivalent to assuming that positive benefits of properties located closer to the park are cancelled by negative values of traffic, noise, and other factors.

For the Town of Orleans, Town of Alexandria Bay, and the Village of Alexandria Bay, the ratio of the \$72 per hundred feet incremental property value to average sales price was multiplied by the average assessed value to arrive at the average enhanced value due to park proximity. Data used in the calculations are shown in Table 1.

Table 1.--Average sales price, assessed value, and incremental values due to proximity to Keewaydin State Park.

Item	Jurisdiction		
	Town of Alexandria Bay	Village of Alexandria Bay	Town of Orleans
Average sale price	\$ 44,272	\$ 41,257	\$ 40,296
Average assessed value	\$ 4,369	\$ 9,583	\$ 18,746
Incremental sales value per 100 feet	-\$72.06	-\$72.06	-\$72.06
Incremental enhanced value per 100 feet	-\$ 7.11	-\$16.74	-\$33.52
Average distance of properties up to 45,100 feet from park	21,150	4,600	26,300
Average distance of properties from 45,100-foot extremity	23,950	40,500	18,800
Number of properties	557	600	476
Average enhanced assessed value	\$ 1,703	\$ 6,780	\$ 6,302
Total enhanced assessed value	\$948,482	\$4,067,820	\$2,999,638

The negative enhancement value associated with increasing distance from the park was converted to a positive value by asserting that for every 100 feet inward toward the park entrance from the 45,100-foot perimeter beyond which the model no longer holds, the incremental enhanced value increases by the positive counterpart of the figure shown in Table 1. This value times the average distance of properties from the 45,100-foot perimeter, per 100 feet, yields the average enhanced assessed value. This figure times the number of properties enhanced yields the total enhanced assessed value, the bottom line of Table 1.

Given the total enhanced assessed value and various property tax rates, the value of Keewaydin State Park to the Towns of Alexandria Bay and Orleans, and the Village of Alexandria Bay were estimated. Table 2 shows incremental 1982 taxes of \$117,981 from the Town of Alexandria Bay, \$633,237 from the Village of Alexandria Bay, and \$70,911 from the Town of Orleans. These total \$822,129 in incremental taxes, or in local annual value to the affected municipalities derived from the presence of Keewaydin State Park.

Table 2.--Taxes paid by residents near Keewaydin State Park attributable to incremental park values.

Tax	Jurisdiction		
	Town of Alexandria Bay	Village of Alexandria Bay	Town of Orleans
Town/County	\$ 40,633	\$233,167	\$22,407
Village	0	68,339	0
Fire/Light	1,337	5,736	7,349
School	76,011	325,995	41,155
Total	\$117,981	\$633,237	\$70,911

SUMMARY AND IMPLICATIONS

State parks are typically established and maintained with the dual objectives of protecting an area of scenic, scientific, or historic importance and providing convenience and recreational facilities that will allow enjoyment of residents of the state and tourists. The primary in-state market for state park visitors is typically residents of metropolitan areas lying within a two-hour drive of the park. Many such parks are located in rural areas. Some, however, are located in close proximity to villages or cities. Particularly in such cases, the question arises as to how these parks affect local communities. Other studies (e.g., Brown et al. 1983; Dean et al. 1978) show the local economic impacts of visitor spending and state park operations. This study suggests that residential property values may also be impacted, and documents two cases out of six examined.

The impact of state parks on surrounding residential properties is in many ways incidental, and reflects benefits of those parks beyond the primary intended benefits for which the parks were created and are currently operated. As a result, it is difficult if not impossible to characterize where such benefits will occur. Most situations previously reported in which property values were impacted by parks were in urban areas. The more urban of the New York parks examined showed no property value effects, but such effects were found in and surrounding two villages. Thus, we would hypothesize that property value effects can occur anywhere that a state park provides notable local benefits. Those benefits can range from immediate open space relief in a highly urban area, which might effect only immediately adjacent properties, to ready access to scenic or recreational resources, which could impact the value of properties over a radius of several miles. The degree of local use of a park is an indicator of the likelihood that these values exist, although situations may occur in which the values are attributable to the open space, scenery, or vistas provided more so than to recreational opportunities.

LITERATURE CITED

- Brown, T.L., D.J. Allee and H. Shimbo. 1983. Assessing the economic impact of state parks in New York: The Wellesley Island/Keewaydin pilot study. Cornell Univ. Dept. of Natural Resources Research and Extension Series 20, 27 p. Ithaca, NY.
- Canadian Outdoor Recreation Research Committee. 1975. The economic impact of parks. 103 p. Ontario Research Council on Leisure. Toronto, Ontario.
- Cohee, M.H., D.R. Garda and J.W. Hunt. 1976. Impact of Kentucky state parks on local, regional, and state economies. 199 p. Kentucky Development Cabinet. Frankfort, KY.
- Correll, M.R., J.H. Lillydahl and L.D. Singell. 1978. The effect of greenbelts on residential property values: some findings on the political economy of open space. *Land Economics* 54(2):207-217.
- Dean, G., M. Getz, L. Nelson and J. Siegfried. 1978. The local economic impact of state parks. *Journal of Leisure Research* 10(2):98-112.
- Hagerty, J.K., T.H. Stevens, P.G. Allen and T. More. 1982. Benefits from urban open space and recreational parks: a case study. *Journal of the Northeastern Agricultural Economics Council* 11(1):13-20.
- Weicher, J.C. and R.H. Zerbst. 1973. The externalities of neighborhood parks: an empirical investigation. *Land Economics* 49:99-105.

TOURIST ATTRACTIONS AND THE VALUES OF SURROUNDING RESIDENTIAL PROPERTY¹

David Manfredonia, Daniel Rossi, A. Robert Koch
Department of Agricultural Economics and Marketing
Cook College
New Jersey Agricultural Experiment Station
Rutgers University
New Brunswick, New Jersey 08903

Abstract. The impact that the establishment of a theme park had on the sales of closely surrounding residential property was examined. It was shown that during the two years immediately prior to the tourist attraction's official opening, the percent increases in the mean sales values of property within two miles of the park were significantly larger than those properties located at a greater distance. However, the situation reversed itself during the time period immediately following the park's opening. These results were substantiated through the creation of a regression model.

Additional Key Words Real estate, recreation, New Jersey theme parks.

INTRODUCTION

With the increasing use of more efficient production techniques, time available for recreational activities continues to slowly but consistently increase for most U.S. workers. This phenomenon is illustrated by government statistics which show that the average U.S. work week has decreased from 38.7 hours per week in 1962 to 34.8 hours in 1982 (U.S. Department of Commerce).

The increased level of leisure time coupled with recently decreasing relative energy prices have, in part, resulted in the regional growth of tourist and recreation industries. New tourist attractions and other facilities are continuously being established and the state and municipal revenues that result have been rapidly increasing.

Today, tourism has been estimated to be among the three largest industries in 43 of the 50 states (Brown, 1980). In addition, tourist

¹New Jersey Agricultural Experiment Station Publication Number J-02256-1-84. This work was performed as part of NJAES project number 02256 and Cooperative Regional Project NE-137 and was supported by state funds and by U.S. Hatch Act funds.

activity has been shown to have significant positive effects on levels of employment within states. For example, tourism in New Jersey creates more jobs annually than any other sector of the state's economy (Kalman, 1984).

Despite the acknowledged importance of tourism at the state level, the economic effects that specific tourist attractions have on their closely surrounding areas are not as apparent. This paper reports the findings of a study designed to examine the impact that a newly established tourist attraction has on sales values and sales frequencies of residential property in closely surrounding areas. The results of the study yield an understanding of trends in the market values of residential property located in close proximity to a day use theme park. The findings also provide insight into the potential impacts that a tourist attraction can have on the tax base of specific municipalities.

STUDY AREA

The regions surrounding two popular New Jersey tourist attractions were used in this study, the Great Adventure Amusement Park located in the south central portion of the state and the Great Gorge Ski Facility which lies in the northwestern region of New Jersey.

Established in July 1974, Great Adventure is the largest area theme park in New Jersey. During the spring and summer months, it is the most visited inland tourist attraction in the state accommodating more than 3 million persons annually. The park covers 1,186 acres and, in addition to a large variety of rides and amusements, Great Adventure offers its patrons a drive thru "safari" section. The area surrounding the park is rural in nature, characterized by a mixture of farm land, vacant land and residential properties with most of the residential properties being rather large (greater than 1.25 acres) and noncontiguous. There does exist, however, small residential clusters which form suburban-like neighborhoods.

Officially opened in December 1965, the Great Gorge facility is the largest and most visited ski area in New Jersey. It has greatly expanded during the past two decades and presently consists of three contiguous areas. It is viewed by many area skiers as a viable alternative to the more distant New England slopes. Except for a more mountainous topography and a lesser degree of farm land, the region surrounding Great Gorge is similar to that which is near Great Adventure; i.e., scattered residential properties located within a rural setting.

PROCEDURE

The study area corresponding to each of the tourist attractions was defined as the circular region extending out in all directions from the facility's borders to a distance of 18,000 feet. In both cases it was

concluded that there were enough residential properties within 18,000 feet of the tourist site to allow for the utilization of statistical tests as a verification of the results.

The study area was then divided into three circular zones. Each zone completely surrounded the tourist attraction, but at increasing distances. This action was taken to facilitate comparisons between zones with respect to the changes of sales values and sales frequencies. In addition, a fourth circular zone was created. This additional region was used as a control area and it extended from 18,000 to 35,000 feet from the border of the tourist site.

Recorded sales information was obtained from the New Jersey Division of Taxation as well as from county and municipal sources. The data included the date of sale, the block and lot number and the sales price of each piece of residential property sold in the four zone study area. In the case of Great Adventure, only those properties transacted during the July 1970 - June 1980 time period were included in the analysis. This ten year time period corresponds to the four years prior to and the six years following the official opening of the park. To facilitate a before and after comparison, the sales data were grouped into five two-year time periods.

The mean sales values of residential property located in each of the four zones during each of the two year time periods were calculated using county tax maps and property listings. In addition, the percentage changes in sales price occurring in each zone between consecutive time periods was determined. T-tests were used to statistically compare the percentage changes in the mean sales values of each of the zones between time periods.

Sales frequency in the Great Adventure area was calculated as follows. The total number of residential properties that existed in 1970 within each of the four zones was determined. The number of recorded residential property transactions of residences that were built prior to 1970 was then determined for each zone during each of the five time periods. The number of transactions in each zone during each time period was then divided by the total number of residential properties that existed in the same zone in 1970. Through this procedure, transfer rates were computed for each zone. A chi-square test was then conducted to statistically determine if there was a difference between the transfer rates of the four zones during any given time period.

The procedure for the Great Gorge analysis was nearly identical to that of Great Adventure. However, since Great Gorge was opened in December of 1965, data on sales that occurred during the January 1960 - December 1970 time period were obtained. Thus, when broken down, the two year time periods correspond to six years prior to and four years following the official opening of the ski facility.

Undoubtedly, numerous variables, other than the creation of Great

Adventure, influenced the sales values and sales frequency of surrounding residential property. To minimize influences not directly related to the park, residences constructed after 1969 (1959 in the case of Great Gorge), and properties within 500 feet of major highways, schools and other land uses that could have had an effect on the values of surrounding property were eliminated from the analysis. In addition, property sales values which were classified by taxing authorities as not being representative of the true market value of the property were excluded from the study.

An added complexity with respect to holding variables constant was the fact that two years prior to the opening of Great Adventure a major interstate highway (Route 195) was completed in the area. The highway passes through each of the four study zones. While the establishment of the roadway undoubtedly resulted in increased accessibility of area residents to shopping malls, employment opportunities, etc., such indirect effects that the roadway may have had on the values of nearby property were not examined. An attempt was made, however, to control for the possible direct effects. All properties within 500 feet of Route 195 were eliminated from the analysis. It was felt that the most dramatic way in which a roadway can affect values of surrounding property is through a decrease in the aesthetic quality of the region and through an increase in environmental noise levels. Through the elimination process, changes in value resulting from these factors were minimized.

Of course, there are many macroeconomic variables that affect the values and frequencies at which residential properties are sold. Factors such as interest rates, and the state of the economy in general play a key role in affecting property transactions. It was assumed, however, that such exogenous variables did not have a significantly greater impact on any one area. Since this study examines changes in sales values and sales frequencies between zones over time, it is assumed that the above major influences affected the entire study area uniformly during each time period.

To further quantify the impact that distance from a tourist attraction has on sales of surrounding residential property, a model explaining prices of residential properties was conceptualized. In abstract form the model was as follows:

$$P = f(D, PC, PA)$$

where:

P = the deflated sales price of residential properties

D = distance of the residence from the tourist attraction

PC = physical characteristics of individual properties

PA = specific attributes of particular areas which can have an affect on numerous properties within the region

Multiple regression was used to estimate the model for the Great Adventure area. The residential properties that were located in the study area and sold during the time period extending from two years before to two years after the official opening of the tourist attraction were identified using tax maps, property lists and recorded sales data. Detailed information about individual property characteristics existing at approximately the time of sale was then obtained from the records of local tax assessors.

The housing component of the consumer price index was the explicit price deflator. The study zone in which each transacted property was located was then employed as an explanatory variable representing distance from the park. Individual property characteristics utilized in the regression analysis included the age of the house at time of sale, square footage of living area, number of bedrooms, number of bathrooms, total number of rooms, total number of acres, square footage of covered parking facilities, road frontage, observed physical condition, style of house and whether house was located on a corner lot. The area attributes included in the analysis were the municipality in which the property was located and the effective tax rate at the time of sale. In addition, an interactive variable was created that combined the time period in which the property was sold (whether it was before or after the official opening of Great Adventure) and the study zone in which the property was located.

RESULTS

Mean Sales Value

The results of the mean sales value analysis indicated that the establishment of the Great Adventure amusement park did have an impact on the values of closely surrounding residential property transactions. There was also strong evidence that the magnitude of the park's effect on sales values decreased as distance from the park increased.

Table 1 illustrates, in matrix form, the detailed results of the mean sales analysis. Reading along the rows, the data can be found which corresponds to each of the four zones examined in this study. The mean sales values of the residential properties sold during each of the five time periods are displayed in Columns 1, 2, 4, 6, and 8. (The figures in parentheses are the number of transacted properties that were used to calculate the corresponding mean sales values.) Columns 3, 5, 7, and 9 illustrate the percentage change in mean sales values that occurred in each zone between each consecutive time period.

The most striking variations in the percentage changes of the mean sales values within and between zones occurred during the July 1972 - June 1974 and the July 1974 - June 1976 time periods. These were the time periods immediately prior to and immediately following the amusement park's official opening. In the July 1972 - June 1974 time period, the mean sales value in zone 1, the zone nearest to the park, was 93 percent higher than the mean

Table 1 - Mean sales values and percent changes in the values of residential property located within the Great Adventure area during the July 1970 - June 1980 time period

	Mean Sales Value July 1970- June 1972 (1)	Mean Sales Value July 1972- June 1974 (2)	Percent Change (3)	Mean Sales Value July 1974- June 1976 (4)	Percent Change (5)	Mean Sales Value July 1976- June 1978 (6)	Percent Change (7)	Mean Sales Value July 1978- June 1980 (8)	Percent Change (9)
	\$	\$	%	\$	%	\$	%	\$	%
Zone 1									
(0 - 6,000 ft.)	19,698 (9) ^a	38,036 (11)	+93	36,875 (4)	-3	37,650 (9)	+2	37,600 (9)	0
Zone 2									
(6,000 - 12,000 ft.)	17,925 (47)	30,519 (34)	+70	32,400 (16)	+6	34,028 (29)	+5	35,041 (27)	+3
Zone 3									
(12,000 - 18,000 ft.)	18,623 (93)	22,528 (86)	+30	31,736 (39)	+40	37,528 (63)	+18	46,801 (82)	+25
Control									
(18,000 - 35,000 ft.)	18,943 (180)	25,765 (103)	+36	34,538 (60)	+34	38,568 (130)	+12	46,357 (90)	+20

a - Number of transactions during time period.

b - Percent changes in mean sales values between two preceding time periods.

sales value in the same zone during the July 1970 - June 1972 time period. The percentage increases within zones 2, 3 and the control during the same two time periods were 70 percent, 30 percent and 36 percent respectively. In the July 1974 - June 1976 time period, immediately after the park opened, the mean sales value within zone one decreased 3.1 percent over the previous two years. During the same time interval, zones 2, 3 and the control increased 6 percent, 41 percent and 34 percent respectively. In all cases, the results of the t-tests indicated that the computed percentage changes between the zones during every time period were significantly different at the .975 confidence level.

It is interesting to note that the average sales prices of the four zones during the July 1970 - June 1972 time period were roughly equivalent. Zone 1 showed a slightly higher mean sales value than the others (\$19,898) and Zone 2 exhibited the lowest value (\$17,925) of the four zones. When the mean sales prices during the July 1978 - June 1980 time period were examined, the values of Zones 3 and the control were significantly greater than the mean sales values of Zones 1 and 2. Thus, based on this analysis, the tourist facility had an initial positive impact on the sales values of properties located within Zones 1 and 2. In the longer run, however, there is strong evidence that the tourist attraction's establishment inhibited increases in sales values of properties located within the two closest zones.

The results of the Great Gorge analysis are illustrated in Table 2. With a few minor exceptions, there are many similarities between the Great Gorge results and those observed from the Great Adventure analysis. During the January 1964 - December 1965 time period, the two years prior to the opening of the ski facility, the mean sales value of properties in Zone 1 increased by 81 percent. This increase was much greater than the increase that occurred in any of the other three zones and it represents the same basic relationship that was illustrated by the Great Adventure analysis. During the January 1966 - December 1967 time period, the two years following the ski facility's establishment, the mean sales values of properties transacted in Zone 1 decreased significantly (-19 percent) while the mean sales values of the remaining zones demonstrated substantial increases. Again, these value changes parallel the results that were observed from the Great Adventure analysis.

From this analysis, it appears that the effect that Great Gorge had on the sales values of surrounding properties was not as far-reaching as the impact that Great Adventure had on its surrounding area. Although it was estimated that Great Adventure's major impact on property values extended to about 12,000 feet, there is little evidence that Great Gorge's measurable impact extended much beyond 6,000 feet from its border.

An additional analysis was conducted to examine the impact of inflation on the sales values of residential property in the Great Adventure study area. The housing C.P.I. for the Northeastern United States was related to property sales in each of the study area zones. The Index of Average Sales Prices of New Homes was also compared to the percent changes in property sales values that occurred in the study area during corresponding time periods.

Table 2 - Mean sales values and percent changes in the values of residential property located within the Great Gorge area during the January 1960 - December 1969 time period

	Mean Sales Value Jan. 1960- Dec. 1961 (1)	Mean Sales Value Jan. 1962- Dec. 1963 (2)	Percent Change (3)	Mean Sales Value Jan. 1964- Dec. 1965 (4)	Percent Change (5)	Mean Sales Value Jan. 1966- Dec. 1967 (6)	Percent Change (7)	Mean Sales Value Jan. 1968- Dec. 1969 (8)	Percent Change (9)
	\$	\$	%	\$	%	\$	%	\$	%
Zone 1									
(0 - 6,000 ft.)	8,630 (10) ^a	8,962 (13)	+3.8	16,182 (30)	+80.6	13,130 (25)	-18.9	19,088 (30)	+45.5
Zone 2									
(6,000 - 12,000 ft.)	9,697 (54)	10,402 (72)	+7.3	11,792 (84)	+13.4	13,991 (69)	+18.6	16,500 (113)	+17.9
Zone 3									
(12,000 - 18,000 ft.)	9,443 (51)	10,119 (96)	+7.2	9,980 (87)	- 1.4	10,937 (62)	+ 9.6	12,895 (97)	+17.9
Control									
(18,000 - 35,000 ft.)	10,111 (118)	10,472 (158)	+3.6	10,848 (198)	+ 3.6	12,254 (149)	+13.0	15,388 (183)	+25.0

^a - Number of transactions during time period.

The percentage changes in Zone 3 and the control correspond much more closely to the percentage changes in the two government indices than do the changes in Zones 1 and 2 (Table 3). This comparison suggests that the variations in sales values that were observed in the two closest zones cannot be solely attributed to inflation.

Transfer Rates

The analysis of transfer rates indicated that the establishment of Great Adventure had little effect on the frequency of residential property transactions in the study area (Table 4). The transfer rate in the control area was slightly lower than it was in Zone 1, 2 or 3, and this occurred consistently throughout the entire ten year time interval. A chi-square statistical test showed that at the .95 confidence level there was no significant differences between the transfer rates of any of the zones during any given time period.

The analysis of transfer rates in the Great Gorge area was consistent with the Great Adventure analysis with one major exception. During the two years prior to the establishment of Great Gorge (January 1964 - December 1965), 30 residential properties in Zone 1 were transacted. This was an increase of 230 percent over the 13 Zone 1 properties that were transacted during the previous time period (January 1963 - December 1965). Chi-square tests indicated that the percent increases in property sales occurring in Zone 1 during the two years prior to Great Gorge's official opening were significantly greater than the increases that occurred in the remaining three zones during the same time period.

Regression Analysis

The results of the regression analysis substantiate the major findings of the mean sale analysis, namely that Great Adventure had an initial positive impact on the sales values of closely surrounding properties. Furthermore, the regression results indicate that the park's effect on property values decreased as distance from the park increased.

Data was acquired on 144 properties that were transacted during the July 1972 - June 1976 time period. A total of 14 independent variables were included in the regression analysis. The final model was estimated as follows:

Table 3 - Percent changes in mean sales values of study zones as compared to the percent changes in Housing CPI and average sales prices of new homes

	July 1972- June 1974	July 1974- June 1976	July 1976- June 1978	July 1978- June 1980
- Percent -				
Zone 1	+ 93	- 3	+ 2	no change
Zone 2	+ 70	+ 6	+ 5	+ 3
Zone 3	+ 30	+ 40	+ 18	+ 25
Control	+ 36	+ 34	+ 12	+ 20
Housing CPI ¹	+ 19	+ 22	+ 20	+ 22
Average sales ₂ price index	+ 25	+ 20	+ 27	+ 32

¹ U.S. Department of Commerce.

² U.S. Department of Housing and Urban Development.

Table 4 - Residential property transfer rates that occurred in study area during July 1970 - June 1980
time period

	Total Number of Properties (1970) (1)	Residential Property Transfer Rates ^a				
		July 1970 - June 1972 (2)	July 1972 - June 1974 (3)	July 1974 - June 1976 (4)	July 1976 - June 1978 (5)	July 1978 - June 1980 (6)
				- percent -		
Zone 1	104	8.7	10.5	3.9	8.7	8.7
Zone 2	330	10.6	10.3	4.9	8.8	8.2
Zone 3	791	11.8	10.8	4.9	8.0	10.4
Control	1778	10.1	5.8	3.4	7.3	5.1

^a - Property Transfer Rate = Total number of residential property transactions that occurred in each zone during the specified time period ÷ total number of residential properties that existed in the same zone during 1970.

$$\begin{aligned}
 \text{Deflated sales value} &= 1963 - 173X_1 + 49X_2 + 1735X_3 + \\
 &\quad (3.39) \quad (6.46) \quad (4.79) \\
 &\quad 8750X_4 + 275X_5 + 4636X_6 \\
 &\quad (4.72) \quad (2.83) \quad (2.95) \\
 R_2 &= .57
 \end{aligned}$$

where:

- X_1 = age of property at the time it was sold (in years)
- X_2 = property's road frontage (in feet)
- X_3 = total number of rooms in house (including bathrooms)
- X_4 = Millstone Township (1 if property was located in
Millstone Township, 0 otherwise)
- X_5 = total number of acres involved in property transaction
- X_6 = before/near (1 if property was sold before the opening
of Great Adventure and was located in
either of the two zones closest to the
amusement park, 0 otherwise)

(The number in parenthesis below each of the variables is the corresponding t statistic).

The estimated coefficients for the variables in the model were all significantly different from zero and had the hypothesized signs. The model explained 57 percent of the variation in the dependent variable. When tested, problems with autocorrelation, heteroskedasticity and multicollinearity were not indicated.

DISCUSSION

The establishment of Great Adventure had an immediate positive effect on the values of properties closest to the park. After the park was in operation, however, values of these properties did not rise as rapidly as the value of more distant properties. A possible explanation of this phenomenon follows.

As Great Adventure was being planned and constructed, it became well known to real estate market participants that the facility would be a major

tourist attraction. Land speculators, foreseeing a significant level of increased development in the area (mostly in the form of restaurants, hotels and other commercial properties) purchased much of the available land in close proximity of the park hoping to subsequently resell the land at a profit. It is likely that speculators, in order to make such profits, were willing to pay unusually high prices for property surrounding the construction site of Great Adventure.

In contrast to land speculators expectations of development resulting from Great Adventure, such development clearly never materialized. Since the park is viewed by virtually all of its users as being a "single day" excursion, demand for hotels and other lodging facilities has not resulted from its establishment. In addition, numerous restaurant areas and snack bars are located within the boundaries of the park, thereby eliminating the necessity for any additional restaurants in the surrounding area.

Detailed discussion with tax assessors who were operating in the study area during the mid 1970's confirms this explanation. In addition, further light is shed by examining the number of properties that were sold in the July 1972 - June 1976 time period and were ultimately resold during the subsequent four years. Of the 65 residential properties transacted in Zones 1 and 2 during the July 1972 - June 1976 time period, 37 percent were resold during the July 1976 - June 1980 time period. Of properties in Zone 3 and the control zone that were sold during the July 1972 - June 1976 time period, only eleven percent and eight percent, respectively, were resold during the next four years. These numbers suggest that when speculators realized that there was not going to be dramatic development occurring in the Great Adventure area, they resold the properties they had previously purchased.

Municipal government officials can use the results of this study to estimate future trends in general property tax revenue. The value at which property is assessed is the ad valorem or market value of its highest and best use. Single family detached residential property is usually considered a highest and best use and is assessed as such. While the tourist attraction as a rateable will likely have a substantial impact on real property tax assessment and revenues, the changing sales prices of property in close proximity to the attraction will also have a measurable impact upon the real property tax base and revenues. The information provided by this study can assist municipal decision makers in creating more accurate predictions of the direction and magnitude of such impacts within their municipality.

References

- Brown, Tommy L., Assessing Changes in the Importance of Tourism Counties and States in the Northeast, paper presented at the Recreation Trends Symposium, Durham, New Hampshire, April 21-23, 1980, p. 2.
- Kalman, Vic, "Jersey's Tourism Officials Expect to Surpass 1983's Banner Performance", The Newark Star Ledger, February 5, 1984, p. 20-23.
- United States Department of Commerce, 1967, "Business Statistics", Washington, D.C.
- United States Department of Commerce, 1970-1980, "Survey of Current Business", Washington, D.C.
- United States Department of Housing and Urban Development, 1970-1980, "Annual Construction Reports", Washington, D.C.

PROPERTY TAXATION IN VERMONT'S SECOND HOME COMMUNITIES, 1974-1980

Malcolm I. Bevins
Extension Professor
University of Vermont
Burlington, VT

Abstract.--Residential property taxes were found to be consistently lower in those Vermont communities with a significant number of second homes. In an effort to determine more precisely the relationship between size of second home community and residential tax levels, an indepth analysis was completed for the years 1974 and 1980 in the 27 communities that had \$10 million or more in second home value. Communities were ranked on five characteristics (total value of all second homes, average value of second home, average value of primary residence, population density, and importance of residential tax base). A summation of community rankings was then plotted against an index of residential taxes per \$100 of fair market value.

Key Words: Second homes, vacation homes, recreation, tourism, property taxation.

INTRODUCTION

This paper will address the impact of second homes on property taxation in Vermont. It does not address the impact of second homes on the level of business activity in a community nor any of the social or environmental issues associated with second home development.

Researchers at the Vermont Agricultural Experiment Station have been monitoring property taxation at the town level every 2 years since 1974.

The purpose of this research is to 1) evaluate the total property tax system in Vermont, 2) evaluate the effectiveness of various tax circuit breakers, and 3) measure and compare burden of taxation on year-round residential property owners.

As is true in many communities, properties are placed on the tax rolls at differing levels of appraisal, even though laws in some states mandate a specific common level. In Vermont where 100% valuation is law, the Division of Property Valuation and Review compares the listed value of specific properties with current sales price of similar properties and assigns an appraisal ratio to all pieces of property in that class in the community. While some problems exist with this system, it works quite well in establishing a "fair market value" for specific classes of property.

For purposes of analysis, residential property taxes per \$100 fair market value in all Vermont communities were calculated, arrayed, and the median community identified. The level of residential property taxation in all other communities was then divided by that of the median community to create a "tax index" for each town.

A tax index is useful in comparing levels of taxation; however, it does not necessarily identify burden. To accomplish this it is necessary to analyze the ability of residents to pay taxes.

An "income index" was calculated for each community from state income tax returns. The average income per tax return filed was determined for each Vermont community. The median community was identified and an income index was created by dividing income in each community by that in the median community.

"Tax burden" was calculated by developing a ratio—dividing income index by tax index. The higher the ratio the lower the burden of property taxation on year-round residents.

TOWN TYPE AND TAXES

The 50 towns with the greatest value in each of five property classes were identified and classified as residential, second home, commercial, industrial, or farm. For each of these towns the tax index, income index, and tax burden ratio were calculated for the period 1974 to 1980 (Table 1).

The residential property tax index in the 50 towns with the greatest value of second home development was consistently at least 20 points lower than the tax index in any other class of property. Similarly, the income index of year-round residents in second home communities was slightly lower than in other types of communities. Despite the lower income in the second home communities, the tax burden ratio was significantly more favorable than in any other class of community.

THE LARGEST SECOND HOME TOWNS

Twenty-seven Vermont towns had \$10 million or more in second home properties (fair market value). Five of these communities, classified as mega, had second home values exceeding \$36 million; 12, classified as giant, had values between \$16 and \$32 million; and 10, classified as large, had between \$10 and \$15 million in second home values.

Between 1974 and 1980 the value of second homes in the mega communities rose by 106%, in the giant communities by 63%, and in the large communities by 32% (Table 2). This compares with a value increase of 48% for all second homes in Vermont in this time period.

Table 1. Residential property tax index, income index, and tax burden in the 50 communities with the greatest dollar amount of property in each of five classes.

Community class	Residential tax index High number = high tax				Income index High number = high income				Tax burden High number = low burden			
	1974	1976	1978	1980	1974	1976	1978	1980	1976	1976	1978	1980
Residential	127	123	118	116	118	117	118	112	93	95	100	97
Second home	79	77	80	82	102	103	104	97	129	134	130	118
Commercial	116	110	107	100	111	111	111	103	96	101	103	103
Industrial	123	117	116	114	110	109	108	108	89	93	93	95
Farm	114	109	107	106	103	102	102	102	90	94	95	96

Table 2. Second homes and primary residences in Vermont largest second home communities, 1974 and 1980.

Second home community class	Total value of second homes, 1980	Number of towns	Total value		Portion of tax base	
			Second homes	Primary residences	Second homes	Primary residences
			1974	1980	1974	1980
	Millions		-- Millions of dollars --			
			P e r c e n t --			
Mega	\$36+	5	109	224	104	178
Giant	\$16-\$32	12	163	265	123	193
Large	\$10-\$15	10	93	123	155	291
Largest second home towns		27	365	612	382	662
All Vermont		245	823	1,220	3,098	5,110
					37	36
					12	12
					47	52

The value of primary residences in these same communities grew by 71%, 57%, and 88% respectively. This compares with a 65% growth in the value of all primary residences in Vermont between 1974 and 1980.

The portion of the tax base in second homes in the mega communities grew by 5%—from 36% to 41%; in the giant communities it remained unchanged at 40%; in the large communities it dropped 3%—from 33% to 30%. The portion of the tax base in primary residences moved nearly the same amount—in an opposite direction.

PERMANENT RESIDENT POPULATION GROWTH

The year-round population in the 27 largest second home towns grew 15% between 1975 and 1980 (Table 3). This compares with an 8% growth in the total state during this time period. The 27 communities fell equally into three classes of growth—20% or more, 10%-19%, and less than 10%.

One might expect an increase in the residential tax index to be associated with rapid growth. Actually the reverse was true (Figure 1). The nine towns with the greatest growth (averaging 28% in the 5-year period) experienced a six-point drop in the residential tax index—from 64 to 58.

The nine towns in the medium-growth class (averaging 15%) experienced a 12-point drop—from 93 to 81.

Those towns in the least growth class (averaging only 2%) experienced a six-point drop in the residential tax level—from 64 to 58 (ironically exactly the same as the high growth towns).

The permanent resident income index fell significantly in both the highest growth communities and the lowest growth communities and remained constant in the middle group. This is difficult to explain from existing data. The largest second home communities are, in most cases, the largest tourism communities. If the relative level of wages in the tourism industry is lower than that in other types of employment, growth of tourism might be accompanied by lower relative income of individual permanent residents.

Another possible explanation may relate to the composition of the permanent population. If retirees select vacation communities for a permanent residence, "reportable" income in that community may decline.

Despite the decline in relative income, permanent residents in the 27 towns had a significantly lower tax burden than residents of other Vermont communities. Permanent residents of the greatest growth communities (20%+) were in the best position (tax burden ratio of 162) with no change from their 1974 position.

Table 3. Permanent resident population change and change in taxes and income, 1974 to 1980.

Permanent resident population growth, 1975-1980										
Item	20% or more		10%-19%		Less than 10%		All large second-home towns		All Vermont	
	1974	1980	1974	1980	1974	1980	1974	1980	1974	1980
Number of towns	9		9		9		27		245	
Average population growth	28%		15%		2%		15%		8%	
Residential tax index	64	58	93	81	64	58	76	72	100	100
Residential income index	104	94	105	106	95	81	101	94	100	100
Tax burden	162	162	113	131	148	140	133	131	100	100

Tax index

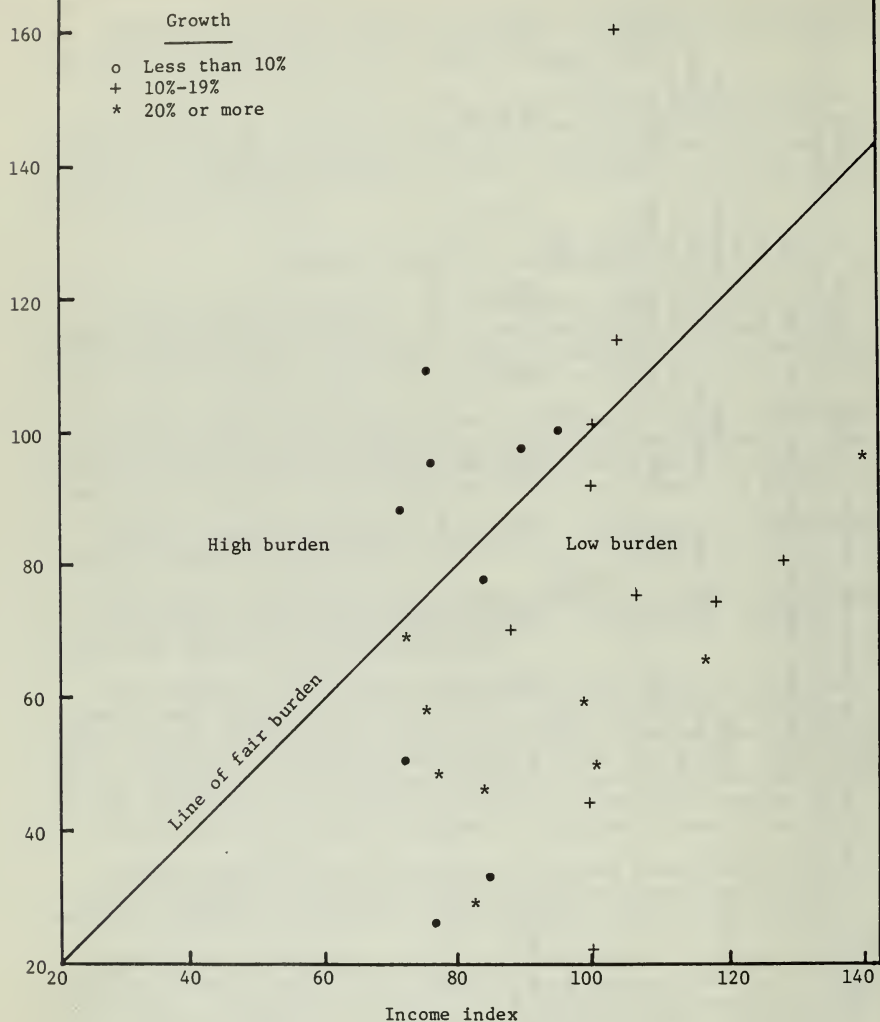


Figure 1. Population growth related to tax and income indexes.

RELATIONSHIP BETWEEN POPULATION, HOUSING, AND RESIDENTIAL PROPERTY TAXES, 1980

It was hypothesized that five conditions might lead to a lower relative residential property tax level:

- 1) High total value of second homes
- 2) High average value of second homes
- 3) High average value of year-round residences
- 4) Low population density
- 5) Year-round residential property a small portion of the total tax base

The 27 communities were arrayed on these five factors (Table 4). Then, a total rank (sum of the five rankings) was calculated for each community (Table 5). The communities were then arrayed on the basis of residential tax index from low to high.

Individual towns were plotted on a chart relating tax index to rank summation (Figure 2). A fairly good linear relationship was revealed (coefficient of determination $R^2 = 57.0\%$).

SUMMARY AND CONCLUSIONS

The property of second home owners is taxed at the same rate as the property of permanent residents in Vermont. Yet, the cost of providing services to second home owners is considerably less. In Vermont approximately 70% of community service cost is for education. Few second home owners educate their children in the second home community. Taxes paid by second home owners significantly reduce the burden of taxes on permanent residents and/or permit vacation communities to provide more services or services of higher quality.

The permanent resident population in the 27 largest second home communities increased at nearly double the state rate between 1974 and 1980. Property tax relief in these communities may be less in future years if the permanent resident population continues to increase at such a rate.

The likelihood of this happening is fairly good for two reasons. First, vacation communities are attractive to permanent residents because of lower taxes and greater access to recreation facilities and amenities. Second, technological advances are allowing more people to work in remote locations rather than in the traditional urban-oriented employment centers.

However, this type of growth can have a positive effect on those communities that carefully plan their future. The quality of local services and the opportunities for local residents can be enhanced with growth. The key to increasing the positive impact and reducing the negative lies in the development of well-designed monitoring and forecasting systems. Long-term benefits must not be sacrificed for short-term gains. Alternative future scenarios must be carefully evaluated. Technology has provided excellent tools for long-range planning. However, a systematic procedure is needed to transfer this technology to the appropriate planning bodies. Here lies an important challenge to the educational community.

Table 4. Array of characteristics of Vermont towns with \$10 million or more in second home value, 1980.

Rank	Total value of second home (\$000,000)		Average value of second home (\$000)		Average value of primary residence (\$000)		Population density (persons/sq. mi.)		Residential property % of all taxable property	
	High to low		High to low		High to low		Low to high		Low to high	
1	Warren	54	Stowe	77	Barnard	57	Stratton	3	Stratton	4
2	Winhall	47	Hartford	68	Dorset	52	Winhall	8	Winhall	8
3	Stowe	46	Waitsfield	64	Fayston	50	Plymouth	8	Dover	14
4	Sherburne	41	Stratton	61	Warren	50	Peru	8	Peru	14
5	Hartford	36	Dorset	60	South Hero	48	Jamaica	14	Sherburne	15
6	Ludlow	32	Winhall	58	North Hero	45	Barnard	17	Warren	18
7	Wilmingon	31	Peru	57	Peru	44	Fayston	17	Plymouth	20
8	Dover	26	Sherburne	56	Winhall	42	Greensboro	18	Wilmingon	20
9	Fayston	24	Warren	56	Londonderry	41	Wardsboro	18	Greensboro	25
10	Londonderry	22	Fayston	54	Waitsfield	41	Dover	19	North Hero	25
11	Peru	20	Greensboro	51	Plymouth	41	Sherburne	22	Fayston	26
12	Cambridge	20	Londonderry	49	Newfane	40	Warren	22	Wardsboro	27
13	Dorset	19	Cambridge	47	Manchester	39	Newfane	28	Jamaica	27
14	Castleton	19	Barnard	46	Stowe	39	Cambridge	32	Stowe	28
15	Stratton	18	Dover	46	Stratton	37	North Hero	32	Ludlow	31
16	Greensboro	18	Manchester	43	Sherburne	37	Dorset	36	Cambridge	34
17	North Hero	16	Newfane	41	Dover	36	Stowe	40	Alburg	35
18	Manchester	15	Plymouth	41	Jamaica	35	Londonderry	42	Londonderry	35
19	Jamaica	15	Ludlow	41	Colchester	35	Wilmingon	46	Hartford	36
20	Plymouth	14	Wilmingon	33	Cambridge	32	Alburg	46	Waitsfield	38
21	Colchester	13	Jamaica	31	Hartford	31	Waitsfield	49	Barnard	40
22	Barnard	12	Castleton	30	Wardsboro	30	Ludlow	67	Castleton	45
23	Newfane	12	Wardsboro	29	Ludlow	27	South Hero	74	Manchester	46
24	Alburg	11	North Hero	28	Wilmingon	27	Manchester	81	South Hero	47
25	South Hero	11	South Hero	26	Greensboro	24	Castleton	91	Dorset	48
26	Waitsfield	10	Alburg	23	Castleton	24	Hartford	182	Newfane	48
27	Wardsboro	10	Colchester	19	Alburg	20	Colchester	350	Colchester	58

Table 5. Relationship between tax index and town rankings on five factors, 1980.

Rank	Tax index Low to high	Town	Town rank within the 27 towns					Summation of rankings
			Population density	Average value of second home	Average value of primary residence	Residential property % of all taxable property	\$ value of second homes	
1	22	Peru	4	7	7	4	11	33
2	27	Winhall	2	6	8	2	2	20
3	30	Plymouth	3	18	11	7	20	59
4	34	Stratton	1	4	15	1	15	36
5	46	North Hero	15	24	6	10	17	72
6	47	Sherburne	11	8	16	5	4	44
7	49	Warren	12	9	4	6	1	32
8	49	Fayston	7	10	3	11	9	40
9	51	Dover	10	15	17	3	8	53
10	58	Waitsfield	21	3	10	20	26	80
11	60	Barnard	6	14	1	21	22	64
12	66	Dorset	16	5	2	25	13	61
13	69	Wardsboro	9	23	22	12	27	93
14	71	Londonderry	18	13	9	18	10	68
15	75	South Hero	23	25	5	24	25	102
16	76	Cambridge	14	13	20	16	12	75
17	78	Jamaica	5	21	18	13	19	76
18	80	Stowe	17	1	14	14	3	49
19	88	Wilmington	19	20	24	8	7	78
20	92	Newfane	13	17	12	26	23	91
21	95	Colchester	27	27	19	27	21	121
22	95	Greensboro	8	12	25	9	16	70
23	97	Manchester	24	16	13	23	18	94
24	100	Ludlow	22	19	23	15	6	85
25	102	Hartford	26	2	21	19	5	73
26	108	Alburg	20	26	27	17	24	114
27	166	Castleton	25	22	26	22	14	109

Tax index

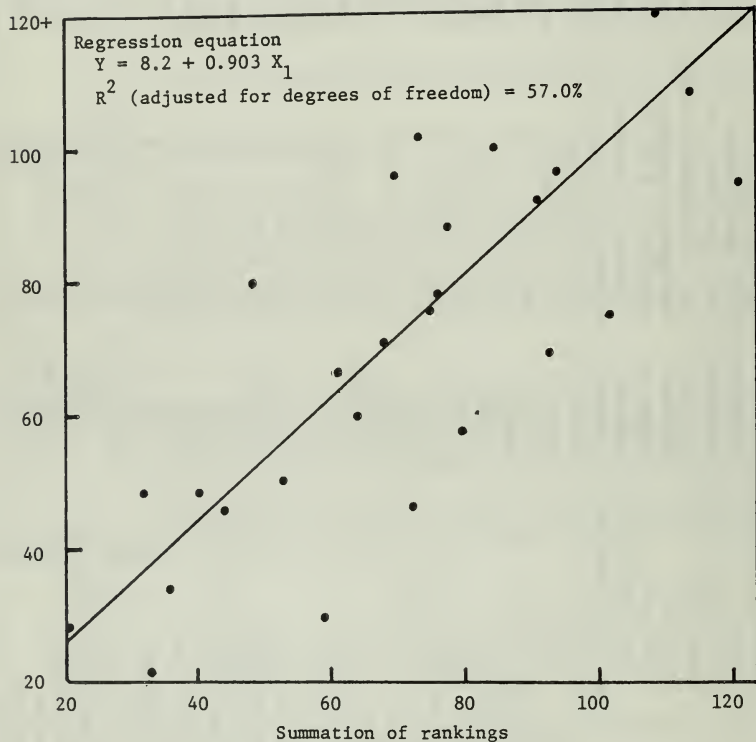


Figure 2. Relationship between tax index and total rank on 5 factors.

IMPACT OF TOURISM ON TOWN REVENUES AND PUBLIC SERVICE COSTS
IN SELECTED DELAWARE SHORE COMMUNITIES 1/

Gerald L. Cole and Gregory J. Kuserk 2/

Abstract.--Town budgets of four coastal communities in Sussex County, Delaware were analyzed to determine revenue sources and public service costs by user category. Seasonal residents typically paid more in taxes than they consumed in services, while the opposite was true for permanent residents, overnight tourists and day tourists.

INTRODUCTION

Many rural counties and communities rely upon tourism as a major source of economic activity. Sussex County, Delaware is one of these areas that has experienced a marked increase in tourism, which currently represents the fourth largest sector of the county's economy.

As the tourism industry grows, however, it can create problems. One of the most serious is population undulations resulting from the seasonality of tourism. In 1980, the coastal towns of Lewes and Rehoboth Beach each had permanent resident populations of approximately 2,000 individuals, with significantly smaller totals in Bethany Beach and South Bethany (U.S. Dept. of Commerce, 1981). During the summer months these populations, augmented by the influx of seasonal residents, overnight tourists and day tourists, swell into the tens of thousands. For Rehoboth Beach, estimates of the average daily population during the peak of the summer season are as high as 69,000 individuals (Bates, 1976).

As a result of these peaks and valleys, the local communities must gear their service structure to two extremely different populations. Therefore, a local government must be acutely aware of the situation it faces. It is important to know the costs which the increased populations exert on the service structure as well as the benefits derived. With such knowledge, a community will be better able to manage the growth and development of its tourism industry.

This study is part of a Northeastern Regional Project (NE-137) concerned with the impact of tourism on rural economic development. The basic goal of the regional study is to understand why certain recreation-oriented rural areas benefit more from tourism than others.

1/ This paper is a contribution to Northeast Regional Project NE-137,
Impacts of Tourism on Rural Economic Development.

2/ Professor and former Graduate Assistant, Department of Agricultural
and Food Economics, University of Delaware, Newark.

The objectives of this study are to: (1) Identify revenues collected from a) permanent residents--those individuals living in the municipality on a year-round basis; b) seasonal residents--those individuals owning property in the municipality, but living elsewhere for the majority of the year; c) overnight tourists--those individuals visiting the municipality and spending at least one night at a hotel, motel or other rental property; and d) day tourists--those individuals visiting the municipality who do not spend the night. (2) Identify expenditures by local governments on services and infrastructure development (i.e. police, refuse collection and disposal), water, sewer, roads, beach improvement and maintenance, medical facilities, administration, etc.). (3) Determine a ratio of per capita use to revenue of services for each group of individuals.

PROCEDURE

The approach used in this study involves the allocation of revenues and expenditures to permanent residents, seasonal residents and tourists. The audited financial statements of the towns of Lewes, Rehoboth Beach, Bethany Beach and South Bethany are the sources from which the allocations are made.

To estimate how much of a service is used, or how much revenue is provided by an individual, a system of weighted equations is used. The equations are weighted according to the proportion of total time an individual is present in a community at the time the revenue is generated or the service is used. In addition to making allocations based on a time factor, the means by which the revenue is raised or expenditure consumed is taken into consideration. With respect to revenues, income is generated through business property taxes, private property taxes, and user fees and fines. A similar breakdown occurs in the use of services, as individuals consume services both directly and through businesses.

Upon establishing the total revenue burden and use of services by each group, the next step is to compare the two figures. This is accomplished by calculating a ratio of use of services to contributions to revenues for permanent residents, seasonal residents, overnight tourists and day tourists.

Values calculated by these ratios are used to analyze the support for services by the four groups. When the ratio for a group is more than one, the conclusion is that the use of the service is greater than the contribution to revenue by that group. Likewise, a ratio of less than one indicates that the group as a whole is paying more to the community than it is extracting in the form of services. A ratio of one naturally is an indication that service use and contribution to revenue are equal.

REVENUE AND EXPENDITURE EQUATIONS

Assigning revenues and expenditures to the four groups of individuals in this study assumes a probabilistic approach in which the sum of the group's probabilities equals one. The basic assumption is that an individual in any

one group consumes a service in the same way as an individual in any other group. Given this assumption, a series of equations can be constructed so that a particular revenue or service can be allocated on the assumption that the probability of its being consumed is a function of the time spent in a community. As will be seen in the following equations, this approach is useful in allocating revenues and expenditures when there is no distinction in the use of services among groups, for example street maintenance, administrative expenses, and parks and recreation expenditures.

The world, however, is not homogeneous. When a difference in the use of a service or contribution to revenue by a specific group can be identified, an adjustment to the basic assumption is made. An example is the use of water and sewer services. Although individuals, on average, may use the same amount of water each day, there is a significant difference in the amount used by each group in a community. Day tourists typically come into a community to use the beach, and in so doing, consume services directly in the form of comfort facilities and showers, and indirectly through local businesses. Their consumption of water and sewer services, therefore, is confined to the use of the comfort station and to whatever use of these services a business makes. Overnight tourists, on the other hand, also use water and sewer services at their places of lodging. This includes water for showers and basic hygiene, which day tourists use elsewhere. Thus, as shown in the equations for sewer and water calculations, adjustments are made to take into account the heterogeneous consumption of these services. Similar considerations are made for fire and police protection, trash collection, assessors' fees, and the like.

In addition to revenue and expenditures which are assigned on the basis of probability, some can be assigned to a group with precision. For example, snow removal is assumed to benefit only permanent and weekend residents, since they are the only individuals present during the winter. A portion of property taxes may also be allocated in a precise fashion based on assessed property values.

It is important to remember that businesses are assumed to pass on all taxes to their patrons. In reality, this assumption may or may not be valid, but if it is true, the complications involved in allocating revenues and expenditures are greatly reduced. If the assumption were not made, additional estimates would be required to determine the proportion of taxes passed on to consumers and the proportion paid by businesses. Furthermore, a determination of whether a business is a partnership or corporation would have to be made to allocate revenues and expenditures to the owners. Ultimately, these owners would have to be identified as permanent or seasonal residents or, in the case of a corporation, tourists. Therefore, to simplify the analysis, it is assumed that taxes are passed on.

The remainder of this section presents the equations used to assign revenues and expenditures, and a description of further assumptions concerning behavior.

Revenues:

Property taxes

$$\begin{aligned} \text{PRREVENUE} &= \text{PR\%} (\text{ASSESRES\%} \times \text{PTAX}) + \text{\%PRYR} (\text{ASSESBUS\%} \times \text{PTAX}) \\ \text{SRREVENUE} &= \text{SR\%} (\text{ASSESRES\%} \times \text{PTAX}) + \text{\%SRYR} (\text{ASSESBUS\%} \times \text{PTAX}) \\ \text{OTREVENUE} &= \text{\%OTYR} (\text{ASSESBUS\%} \times \text{PTAX}) \\ \text{DTREVENUE} &= \text{\%DTYR} (\text{ASSESBUS\%} \times \text{PTAX}) \end{aligned}$$

where:

$$\begin{aligned} \text{PRREVENUE} &= \text{property tax revenue from permanent residents} \\ \text{SRREVENUE} &= \text{property tax revenue from seasonal residents} \\ \text{PR\%} &= \text{proportion of permanent residents to total residential population} \\ \text{SR\%} &= \text{proportion of seasonal residents to total residential population} \\ \text{\%PRYR} &= \text{weighted yearly average permanent resident population} \\ \text{\%SRYR} &= \text{weighted yearly average seasonal resident population} \\ \text{\%OTYR} &= \text{weighted yearly average overnight tourist population} \\ \text{\%DTYR} &= \text{weighted yearly average day tourist population} \\ \text{ASSESRES\%} &= \text{percentage assessed value of residential property} \\ \text{ASSESBUS\%} &= \text{percentage assessed value of commercial property} \\ \text{PTAX} &= \text{total property tax revenue} \end{aligned}$$

Property taxes collected by local governments are shared by residents and tourists to the extent that tourists patronize businesses which pay taxes. In the equations above, permanent and seasonal residents are responsible for property taxes paid directly by them, along with taxes indirectly paid through businesses. To account for the directly paid taxes, total property taxes collected by a town are multiplied by the percentage of the total assessed value of town property owned by residents. This value, in turn, is weighted by the percentage of permanent residents to total residential population and the percentage of seasonal residents to total residential population, in order to estimate each group's tax burden. Added to this figure is the business portion of the tax which multiplies the total property tax by the percentage of the total assessed value of property in the town owned by businesses, and then by the weighted yearly average permanent and seasonal resident populations. Overnight and day tourists, paying taxes only through businesses, use the second portion of the previous equations which multiplies their respective weighted yearly average populations by the business property taxes.

Expenditures:

Year-round service expenditures

$$\begin{aligned} \text{PREXPEND} &= \text{\%PRYR} \times \text{EXPEND} \\ \text{SREXPEND} &= \text{\%SRYR} \times \text{EXPEND} \\ \text{OTEXPEND} &= \text{\%OTYR} \times \text{EXPEND} \\ \text{DTEXPEND} &= \text{\%DTYR} \times \text{EXPEND} \end{aligned}$$

where:

PREXPEND = expenditures on permanent residents
SREXPEND = expenditures on seasonal residents
OTEXPEND = expenditures on overnight tourists
DTEXPEND = expenditures on day tourists
%PRYR = weighted yearly average permanent resident population
%SRYR = weighted yearly average seasonal resident population
%OTYR = weighted yearly average overnight tourist population
%DTYR = weighted yearly average day tourist population
EXPEND = total expenditures for the service
Service categories: Administrative expenditures, street department expenditures, parks and recreation expenditures, miscellaneous

These categories include services provided year-round which are consumed on a constant basis throughout the year by permanent residents, but disproportionately by the other groups. The coefficients %PRYR, %SRYR, %OTYR and %DTYR are the weighted average population percentages of permanent residents, seasonal residents, overnight tourists and day tourists, respectively, and are calculated as follows:

$$\frac{365 \text{ (PRPOP)}}{\text{TOTAL WEIGHTED POP.}} = \%PRYR$$

$$\frac{98.6 \text{ (SRPOP)}}{\text{TOTAL WEIGHTED POP.}} = \%SRYR$$

$$\frac{84 \text{ (OTPOP)}}{\text{TOTAL WEIGHTED POP.}} = \%OTYR$$

$$\frac{84 \text{ (DPOP)}}{\text{TOTAL WEIGHTED POP.}} = \%DTYR$$

In using 365 as the weight for permanent residents, the assumption is that the average daily population of permanent residents equals the total permanent resident population.

The weight of 98.6 is the average number of days spent in the community, as estimated in a study by David L. Chicoine (1971). The weight of 84, used in calculations for overnight and day tourists, assumes a tourist season of 12 weeks or 84 days, and therefore, the average amount of time spent in the area by these individuals.

Summer service expenditures

PREXPEND = %PRSM x EXPEND
SREXPEND = %SRSM x EXPEND
OTEXPEND = %OTSM x EXPEND
DTEXPEND = %DTSM x EXPEND

where:

%PRSM = percentage of the total summer population represented by permanent residents
%SRSM = percentage of the total summer population represented by seasonal residents

%OTSM = percentage of the total summer population represented
 by overnight tourists
 %DTSM = percentage of the total summer population represented
 by day tourists
 EXPEND = total expenditures for the service
 Service categories: Bandstand music expense, bandstand
 maintenance and equipment, parking meter
 department, comfort station expense,
 boardwalk expense, lifeguards,
 miscellaneous

Included in this method of weighting are service categories consumed solely during the summer when it is assumed that all classifications of individuals are at their peak average populations. The coefficients %PRSM, %SRSM, %OTSM and %DTSM are the percentages of the total summer population represented by permanent residents, seasonal residents, overnight tourists and day tourists, respectively, and are determined as follows:

TOTAL SUMMER POPULATION = No. of permanent residents +
 No. of seasonal residents + No. of overnight tourists +
 No. of day tourists

$$\%PRSM = \frac{\text{No. of permanent residents}}{\text{TOTAL SUMMER POPULATION}}$$

$$\%SRSM = \frac{\text{No. of seasonal residents}}{\text{TOTAL SUMMER POPULATION}}$$

$$\%OTSM = \frac{\text{No. of overnight tourists}}{\text{TOTAL SUMMER POPULATION}}$$

$$\%DTSM = \frac{\text{No. of day tourists}}{\text{TOTAL SUMMER POPULATION}}$$

Building related service expenditures

PREXPEND = WTPRPOP (RESDHS% x EXPEND) + %PRYR (BUS% x EXPEND)
 SREXPEND = WTSRPOP (RESDHS% x EXPEND) + %SRYR (BUS% x EXPEND)
 OTEXPEND = %OTYR (BUS% x EXPEND)
 DTEXPEND = %DTYR (BUS% x EXPEND)

where:

STPRPOP = weighted percentage of permanent residents to
 total residential population

WTSRPOP = weighted percentage of seasonal residents to
 total residential population

%PRYR = weighted yearly average permanent resident
 population

%SRYR = weighted yearly average seasonal resident
 population

%OTYR = weighted yearly average overnight tourist
 population

%DTYR = weighted yearly average day tourist population

RESDHS% = residential housing as a percentage of the total
 number of buildings in the town

BUS% = commercial units as a percentage of the total number
of buildings in the town
EXPEND = total expenditures for the service
Service categories: assessors' fees, fire department,
trash collection, miscellaneous

Under this heading are services rendered as a direct result of a building standing in place year-round. The first step in the calculation is to divide the expenditures into those attributable to residential housing, and to businesses. This is done by multiplying total expenditures by the percentage of residential housing in the town, and by the percentage of business units. The residential portion is then multiplied by the weighted year-round percentage of permanent and seasonal residents, using the sum of permanent and seasonal residents as the total population to determine the respective group's consumption of a service. In addition, because permanent and seasonal residents consume services through businesses, the business portions of expenditures are multiplied by the weighted average population of permanent residents to the total population, and the weighted average population of seasonal residents to the total population. These figures, when added to the previously calculated figures, represent the total consumption of services by permanent and seasonal residents.

Being non-property owners, tourists consume services under this heading only through businesses. Hence, expenses attributable to businesses are multiplied by the weighted average population of overnight tourists to determine consumption of services by that group, and by the weighted average population of day tourists to determine their consumption of services.

Police service expenditures

PREXPEND = %PRSM (%SMSEAS x EXPEND) + WTPRPOP [RESDHS% (%OFFSEAS x EXPEND)] + %PRYR [BUS% (%OFFSEAS x EXPEND)]
SREXPEND = %SRSM (%SMSEAS x EXPEND) + WTSRPOP [RESDHS% (%OFFSEAS x EXPEND)] + %SRYR [BUS% (%OFFSEAS x EXPEND)]
OTEXPEND = %OTSM (%SMSEAS x EXPEND) + %OTYR [BUS% (%OFFSEAS x EXPEND)]
DTEXPEND = %DTSM (%SMSEAS x EXPEND) + %DTYR [BUS% (%OFFSEAS x EXPEND)]

where

%PRSM = percentage of the total summer population represented
by permanent residents
%SRSM = percentage of the total summer population represented
by seasonal residents
%OTSM = percentage of the total summer population represented
by overnight tourists
%DTSM = percentage of the total number population represented
by day tourists
WTPRPOP = weighted percentage of permanent residents to total
residential population
%PRYR = weighted yearly average permanent resident population
%SRYR = weighted yearly average seasonal resident population
%OTYR = weighted yearly average overnight tourist population

%DTYR = weighted yearly average day tourist population
 RESDHS% = residential housing as a percentage of total number
 of buildings in the town
 BUS% = commercial units as a percentage of total number
 of buildings in the town
 %SMSEAS = percentage of police expenditure incurred during the
 summer season
 %OFFSEAS = percentage of police expenditure incurred during the
 off season
 EXPEND = total expenditures for the service.

Police services protect individuals as well as property. The equations above, therefore, reflect this dual role. The first portion runs the POPSMS system of equations on police expenditures incurred during the summer months. These expenditures are estimated by observing increased police personnel during the summer, and projecting a similar increase for police expenditures, [see table 1]. The second portion of the equation performs the Building Related Service Expenditures function on the remainder of the expenditures. This spreads expenses throughout the year and is based on the protection of property and of those residing or conducting business at these properties. The two figures combined give an estimate of the increased protection during the summer of all those present in the community, along with the protection of property and individuals throughout the year.

Water and sewer related service expenditures

PREXPEND = %PRYR (%BUNHT x EXPEND) + WTPRPOP (%BURESD x EXPEND)
 SREXPEND = %SRYR (%BUNHT x EXPEND) + WTSRPOP (%BURESD x EXPEND)
 OTEXPEND = %OTYR (%BUNHT x EXPEND) + (%BUHT x EXPEND)
 DTEXPEND = %DTYR (%BUHNT x EXPEND)

where:

%PRYR = weighted yearly average permanent resident population
 %SRYR = weighted yearly average seasonal resident population
 %OTYR = weighted yearly average overnight tourist population
 %DTYR = weighted yearly average day tourist population
 WTPRPOP = weighted percentage of permanent residents to
 total residential population
 WTSRPOP = weighted percentage of seasonal residents to
 total residential population
 %BURESD = percentage of residential units in the town, where
 a unit is defined as either a single family dwelling
 or a hotel, motel or apartment unit
 %BUHT = percentage of hotel, motel and apartment units
 %BUNHT = percentage of business establishments
 EXPEND = total expenditures for service

The categories contained in this classification include services consumed as a function of the number of individuals occupying a structure. This considers the multiple occupancy of a hotel, motel or apartment complex, when

Table 1.--Increased in summer police expenditures for selected Delaware communities, 1982

Town	Number of year-round police	Number of summer police	Percent of expenses off-season	Percent of expenses summer
Lewes	6	0	.75	.25
Rehoboth Beach	19	18	.60	.40
Bethany Beach	5	3	.65	.35
South Bethany	2	1	.67	.33

Source: Lewes, Rehoboth Beach, Bethany Beach and South Bethany town offices.

a single unit consumes the service in much the same manner as would an individual residential unit. The first step is to calculate services used through businesses (%BUNHT: all commercial units including hotels, motels and apartment complexes would represent one unit each). The consumption of services by these businesses is allocated to each classification using the weighted average population of each group to the total population throughout the year. In the case of day tourists, this represents the total consumption of these services. For overnight tourists, the consumption of services through rental units is added to the consumption through businesses by multiplying the percentage of hotel, motel and apartment units by total expenditures on the service. Finally, the calculation of expenditures for permanent and seasonal residents is completed by adding the consumption of services through the residences of these individuals. The calculation is made by first multiplying the total expenditure by the percentage of residential units, then allocating expenses using the weighted percentages of permanent and seasonal residents to the total residential population.

RESULTS

The use to contribution ratios for Lewes (table 2) show a distinct difference in the use of services per dollar of revenue contribution between seasonal residents and all other groups. In 1981, for instance, a seasonal resident could expect to use 43 cents worth of services for every dollar paid to the local government. However, permanent residents, overnight and day tourists received, respectively, \$1.37, \$2.00, and \$2.02 worth of services for each dollar paid.

Although data collected over 11 years show no statistical difference in the ratios between permanent residents and tourists, it should be noted that from 1976 through the most recent period, permanent resident ratios have been consistently lower than tourist ratios.

Table 2.--Lewes use to contribution ratios, 1971-81

Year	Permanent residents	Seasonal residents	Overnight tourists	Day tourists
1981	1.37	.43	2.00	2.02
1980	1.34	.42	2.24	2.26
1979	1.37	.40	1.84	2.02
1978	1.30	.43	1.80	1.94
1977	1.31	.43	1.54	1.55
1976	1.33	.42	1.53	1.54
1975	1.41	.43	1.05	1.05
1974	1.64	.55	2.67	2.30
1973	1.50	.36	1.13	1.15
1972	1.49	.34	1.42	1.57
1971	1.21	.49	1.31	1.24

Source: Lewes Town Government and calculations.

As in Lewes, seasonal residents in Rehoboth Beach pay for more services than they use, although they consume more services for their dollars than their counterparts in Lewes. During 1981 they consumed 88 cents worth of services for each dollar, the highest amount in all the years surveyed (table 3).

Table 3.--Rehoboth Beach use to contribution ratios, 1970-81

Year	Permanent residents	Seasonal residents	Overnight tourists	Day tourists
1981	1.41	.88	1.01	.91
1980	1.24	.78	1.03	1.09
1979	1.27	.82	1.11	1.00
1978	1.34	.82	1.13	.93
1977	1.31	.82	1.03	1.01
1976	1.29	.79	1.11	1.04
1975	1.18	.73	1.11	1.20
1974	1.37	.80	1.12	.96
1973	1.32	.75	1.09	1.09
1972	1.21	.69	1.15	1.22
1971	1.22	.73	1.12	1.19
1970	1.29	.72	1.22	1.15

Source: Rehoboth Beach Town Government and calculations.

Permanent residents also consumed more services per dollar than in any previous year. In addition there is a significant difference in the average use to contribution ratio over the 12 years between permanent residents and tourists. Table 3 shows that the use of services and contribution to revenues by tourists is close to one, especially in more recent years.

Figures for Bethany Beach clearly show that day tourists receive the most for their money in services. At the beginning of the survey period, this group consumed as much as \$4.42 worth of municipal services for each dollar contributed to revenues (table 4). The ratio was effectively cut in 1974 when the town began to make full use of its parking meters.

Seasonal residents are in the same predicament as already observed in the previous towns; they pay more for services than the other groups. On the average, they recoup about half of each dollar in the form of services. The ratio is apparently quite stable with the exception of 1972 and 1973, when it declines to approximately .40, and 1980 when it increases to .68.

Table 4.--Bethany Beach use to contribution ratios, 1970-81

Year	Permanent residents	Seasonal residents	Overnight tourists	Day tourists
1981	1.17	.57	1.09	2.08
1980	1.13	.68	1.16	1.63
1979	1.16	.53	1.04	2.14
1978	1.06	.52	1.45	1.54
1977	1.16	.52	.97	2.23
1976	1.23	.55	.96	2.07
1975	.86	.58	1.47	1.93
1974	1.18	.51	.94	2.56
1973	.88	.39	1.63	3.35
1972	.91	.41	1.42	4.42
1971	1.19	.52	1.40	3.15
1970	1.15	.50	1.46	3.28

Source: Bethany Beach Town Government and calculations.

Data show no significant difference between permanent residents and overnight tourists. For nine out of the 12 years, each group consumes more services than it pays for, although the ratio varies much more for overnight tourists than for permanent residents.

The most interesting group in South Bethany is overnight tourists. In 1977, the town began collecting a renter's tax from individuals staying in rental properties. The effects of this tax are clearly reflected in the drop in the ratio for the same year. Overnight tourists had been receiving \$2.31

in services for every dollar contributed, but this drops to only \$.76 for every dollar (table 5). Before the tax, the overnight tourist ratio is almost identical to that of day tourists. After the tax, however, day tourists remain at a high level of consumption per dollar because the tax does not affect them.

Table 5.--South Bethany use to contribution ratios, 1970-81

Year	Permanent residents	Seasonal residents	Overnight tourists	Day tourists
1981	1.08	.85	.64	2.64
1980	1.42	.82	.69	2.22
1979	1.09	.81	.80	2.87
1978	1.15	.81	.64	2.77
1977	1.39	.89	.76	1.53
1976	1.23	.77	2.31	2.31
1975	1.36	.81	2.00	2.01
1974	1.29	.97	1.01	1.01
1973	1.66	.74	3.30	3.30
1972	1.58	.70	3.78	3.78
1971	1.80	.78	2.91	2.91
1970	2.35	.92	1.43	1.44

Source: South Bethany Town Government and calculations.

Ratios for permanent residents indicate their strong tendency to consume more services than they pay for. Although the ratio has twice come close to reaching one--1981 and 1979--it has consistently stayed well above that level.

Seasonal residents in South Bethany do not consume as much in services as they pay for, but do maintain a steady ratio which nearly equals one. In fact, in 1974 they are within 3 cents per dollar of consuming as much as they pay out in revenues.

CONCLUSIONS

The overwhelming finding of the study was that seasonal residents typically paid more in taxes than they consumed in services, primarily because of how the towns collected taxes from property owners. Because the towns did not differentiate between permanent and seasonal residents in the collection of property taxes, seasonal residents paid for services on a yearly basis but consumed most services only during part of the year. As a result, use to contribution ratios were consistently below 1. Although this imbalance may seem unfair, it is plausible that seasonal residents may have gained benefits not associated with the town and/or were simply willing to pay a premium to own property in the town.

It should also be noted that tourists can take advantage of a town's services while paying little in the way of revenues; however, through taxes or user fees, they can be made to pay their share. Sources of revenue from day and overnight tourists included occupancy taxes at motels/hotels/rooming houses, renter taxes on cottages, day use fees for parking and beach access, and business taxes aimed at goods and services purchased by them.

LITERATURE CITED

- Bates, Rodger A. 1976. The seasonal resort community: structural adjustments to population undulations. Unpublished doctoral dissertation, Newark, DE: University of Delaware.
- Chicoine, David L. 1971. A profile of Delaware's seasonal home occupants and permanent residents with local public policy implications. Unpublished master's thesis. Newark, DE: University of Delaware.
- U. S. Department of Commerce, Bureau of the Census. 1981. 1980 census of the population: Delaware, Washington, D. C.: Government Printing Office.

ECONOMIC AND NON-ECONOMIC QUALITY OF LIFE INDICATORS IN RURAL TOURIST AND NON-TOURIST COMMUNITIES

Lawrence R. Klar, Jr., William Keegan and Rodney Warnick

Abstract. The purpose of this study was to compare selected economic and non-economic quality of life indicators in rural tourist and non-tourist Massachusetts communities. While findings were mixed, a trend emerged suggesting that a number of quality of life factors in tourist communities were lower in non-tourist communities.

Additional keywords: Tourism, recreational development, non-economic quality of life indicators.

INTRODUCTION

Studies often suggest that tourism is responsible for stimulating the local economy, creating new sources of tax revenue and greatly increasing new employment opportunities. A recent study (Mahoney, 1982) reported that tourism in Massachusetts was responsible for yielding such substantial economic benefits. James Carlin, Massachusetts Director of Commerce, was quoted as follows:

Travel and Tourism is a three billion dollar business in Massachusetts and the direct and indirect taxes produced are big! For the dollars invested and the energy expended, there is no more productive generator of the tax revenue than the tourism industry (pp. 4-5).

In addition, studies conducted by Fritz and Konecny (1981) also provided support for the idea that tourism can be an important stimulus to economic activity.

However, in reviewing tourism from a non-economic perspective, it was somewhat alarming to discover that very little research has been conducted to determine how tourist communities may differ from non-tourist communities in terms of quality of life characteristics of both an economic and non-economic nature. For example, it is not uncommon to find problems associated with crime, housing, public services and pressures on the infrastructure within many types of communities. Might these conditions be more pressing in tourist rather than non-tourist communities as Runyan and Tongwu (1979) have suggested?

Additional concerns brought about by the pressure of tourism development were expressed in research conducted by Pizam (1977), titled, "Some Costs and Benefits of Tourism to Rural Communities, The Cape Cod Case." Pizam reported that a significant number of polled Cape Cod residents stated that tourism had created detrimental social and physical conditions within their particular communities. Other studies have also suggested that economists are not convinced that the quality of life of a community can best be expressed in strictly monetary terms (Baumol and Oates, 1980).

Accordingly, the purpose of this study was to compare selected economic and non-economic quality of life factors in rural tourist and non-tourist communities in The Commonwealth of Massachusetts. The specific objectives of the study were to:

1. select the study sample by developing criteria for identifying communities as (1) rural tourist and (2) rural non-tourist in nature;
2. identify differences in selected quality of life factors between rural tourist and non-tourist communities.

METHOD

Sample Selection

Rural-tourist communities were selected on the basis of low population densities and high concentrations of tourist-related businesses. Communities qualifying for inclusion were limited to those having populations less than 25,000. Tourism levels were determined through the use of the Massachusetts Hotel and Room Sales Tax Data and by extracting data from the following standard industrial classifications categories: (1) Eating and Drinking Establishments (Code 58), (2) Hotels and Motels (Code 70) and (3) Amusement Areas (Code 79).

Communities included in the tourist sample were required to have more than ten eating and drinking establishments, more than four hotels or motels, and more than three areas under the category of amusement. Sixteen towns qualified. The town of Barnstable slightly exceeded the population limit (pop. 30,000); however, since it was widely known as a premier rural-tourist community, it was included in the tourist sample which then consisted of seventeen communities.

Rural non-tourist communities were drawn from the remaining list of Massachusetts Rural Communities. Communities were numbered and seventeen communities were selected through the use of

a random numbers table. The 34 communities included in the study were:

Tourist Communities

Adams
Barnstable
Bourne
Dalton
Deerfield
Dennis
Edgartown
Falmouth
Great Barrington
Greenfield
Lee
Lenox
Nantucket
Oak Bluffs
Provincetown
Williamstown
Yarmouth

Non-tourist Communities

Bellingham
Bridgewater
Burlington
Dracut
Fairhaven
Franklin
Hadley
Hingham
Monson
North Brookfield
Scituate
Stoneham
Sutton
Wakefield
Westborough
Winchester
Wrentham

Assessment Criteria

More than 100 variables were identified in the literature that researchers had utilized in a variety of ways to characterize life in all types of communities. The list was reduced by including only those variables that were relevant in rural settings and which could be measured through secondary data sources. The earlier research of Liu (1975a, 1975b, 1977) also influenced the selection process. The following 40 measures were applied in the assessment procedure:

1. Number of hospital beds per capita
2. Persons age 16-19 without High School diplomas
3. Per capita expenditures on public safety
4. Percapita local expenditures on education
5. Number of school-age children, grades K-12
6. Number of persons having completed 4 years of college
7. Number of physicians
8. Number of married individuals
9. Number of divorced individuals
10. Persons five years and older residing in a different house since 1975
11. Number of violent crimes
12. Number of occupied housing units with complete plumbing
13. Number of property crimes
14. Number of occupied housing units without a telephone
15. State aid allocations (1980 Cherry Sheet Data)
16. Per capita expenditures on public maintenance/services
17. Persons unemployed, 16 years and older, for more than 15 weeks.
18. Number of robberies

19. Number of persons employed in farming, fishing and forestry
20. Number of persons working full-time
21. Median income earnings per family
22. Number of families with two or more workers
23. Number of full-time workers
24. Occupied housing units with no bathroom or half-bathroom
25. Number of families with income above poverty level
26. Average number of persons per household
27. Median age
28. Unemployment rate
29. Number of vacant housing units held for occasional use
30. Number of renter occupied housing units
31. Mean value of owner-occupied housing units
32. Number of households with income below \$5,000
33. Median family housing cost by monthly mortgage rates
34. Number under 35 years of age below poverty level
35. Median wage of year-round, full-time workers
36. Median rent asked
37. Number of boarded up vacant housing units
38. Property tax assessment per \$1,000 evaluation
39. Number of housing units with public septic/sewer systems
40. Number of housing units using public water system

Assessment Procedure

Data pertaining to the assessment phase were obtained by examining annual town reports, 1980 Massachusetts Census of Housing, income data, Uniform Crime Reports, and information collected through regional planning agencies. The majority of information was available in the 1980 census data.

Mean scores for each variable were compared for tourist and non-tourist communities. In addition, factor analysis was utilized to determine if variables clustered together to form logically distinct sets of variables.

FINDINGS AND DISCUSSION

T-test comparisons of mean scores revealed a number of differences between tourist and non-tourist communities that were found to be statistically significant beyond the .05 level of confidence (Table 1). These data suggest that on certain indicators of a community's quality of life, tourist communities emerged in a less favorable light. In non-tourist communities, earnings were higher for a larger number of families, fewer families were below the poverty level and more family members were employed. Furthermore, property values were higher, state aid allocations were greater and families were slightly larger and included more school-aged children which is indicative of greater stability.

Table 1. Significant T-test Results Comparing Quality of Life Variables in Tourist and Non-Tourist Communities

Variable	X Non-Tourist	SD	X Tourist	SD	P
School-age children	3303.4	1579.8	1937.1	1594.5	.017
State aid allocated	184.6	53.4	104.6	52.3	.001
Median income	24283.5	3907.4	19009.7	2809.4	.001
Two or more workers	2410.1	1134.3	1445.4	1024.0	.014
Full-time workers	4471.8	2230.2	2603.9	1997.7	.015
Fam's above poverty	3206.6	1503.3	1961.1	1471.6	.020
Persons/household	3.0	0.3	2.5	0.2	.001
Prop'y tax assess.	35.4	7.7	24.4	9.4	.001
Pub. maint. costs	77.2	40.6	110.4	43.4	.028
Housing-occas'l use	17.6	13.8	329.2	536.0	.029
Empl'd farm, fish, or forestry	76.8	37.9	169.9	174.7	.046

Other differences also suggest the presence of less than desirable conditions in tourist communities, although these were not found to be significantly different in statistical terms (Table 2). In tourist communities there were fewer marriages, fewer with at least four years of college, more households with incomes under \$5000, fewer households with telephones, a lower median wage and a greater number of houses boarded up.

There were more part-time workers in non-tourist communities, which might be surprising given that tourist-based industries frequently rely heavily on part-time support. However, non-tourist communities were found to have two or more workers per family significantly more frequently than was the case in tourist communities. It may be that many of these workers were employed in part-time positions. In neither case is the stability nor regularity of part-time employment known.

Table 2. Non-significant T-test Quality of Life Factor
Comparisons Between Tourist and Non-tourist Communities
Indicating Trends Toward Differences

Variable	X Non-Tourist	SD	X Tourist	SD	P
Expenditures-Public Safety	67.1	27.3	83.5	49.3	.243
Ind's w/4 yrs Col	1255.1	901.2	906.1	811.9	.244
Marriages	6983.4	3226.5	4960.0	3845.9	.106
No telephone	80.4	51.2	121.8	101.8	.148
Households under \$5,000 income	361.9	361.9	499.5	411.1	.227
Boarded housing	3.9	3.1	6.8	8.8	.218
Part-time workers	684.9	364.6	478.4	387.6	.119
Median wages	14921.1	12188.8	10853.0	2232.9	.194

Employment in the occupations of farming, fishing and forestry was found to be higher in tourist communities. It is difficult to determine if this is a desirable occurrence, or not. These are industries that may be viewed positively by residents desiring to maintain a rural flavor in their communities. In addition, for the most part, they do not have negative impacts on the surrounding environment. However, these can also be unstable industries, subject to being affected negatively by a variety of external influences. Thus, some degree of uncertainty is experienced by those involved in these areas of employment. Conclusions involving this factor cannot be drawn from the data available in this study. It can be said, however, that very few industries were present in the tourist communities other than tourism itself. Due to the nature of many tourist related endeavors, this often means that many job opportunities are not of high quality, require low skill levels and are relatively low in pay.

Overall, the results of this study depict tourist communities as somewhat fragmented and, in some respects, less economically solvent than non-tourist communities. Furthermore, tourist communities were found to have uneven pressures on their infras-

structures and more social problems. This is not inconsistent with what is frequently found in communities that have large transient populations and industries that provide little stability for their employees.

It should be pointed out that the sample size of the study communities was small. A larger sample may well have produced additional findings within acceptable, statistically significant limits.

The data depict a picture of community life that extends beyond economic descriptors. The findings would not suggest that attempts to stimulate the economy, educational or stability levels of a community through increases in tourism development would necessarily be fruitful. It cannot, of course, be concluded that tourism, per se, has caused any of the reported differences. Obviously differences may have evolved for a variety of other reasons. Regardless, it would seem that plans to increase tourism development in rural communities should be approached with great caution; the possibility should be considered that community problems of both an economic and non-economic nature may be exacerbated by high concentrations of certain tourist related industries.

LITERATURE CITED

- Baumol, William J. and Wallace Oates. 1980. Economics, Environmental Policy and the Quality of Life. In Journal of Economic Issues, vol. 14.
- Fritz, R.G. and M. Konecny. 1981. Tourism Impact Model: A Functional Tool. In Journal of the Urban Planning and Development Division of Civil Engineers, August.
- Liu, Ben-Chien. 1975a. Quality of Life: A Regional Perspective. In American Journal of Economics and Sociology, vol. 34.
- _____. 1975b. Quality of Life Indicators in U.S. Metropolitan Areas, 1970. Washington, D.C.: EPA Publication.
- _____. 1977. Rate Migration and the Quality of Life. In Review of Economics and Statistics, vol. 57, no. 2.
- Mahoney, Edward M. 1982. Assessing the Impacts of Tourism on Rural Communities--It's Time to go Prospecting Again. Unpublished research paper, University of Massachusetts, Amherst.
- Pizam, Abraham. 1977. Some Costs and Benefits of Tourism to Rural Communities, The Cape Cod Case. Research paper presented at the 8th Annual TTRA Conference, June.
- Runyan, Dean and Chung Tong-Wu. Assessing Tourism's More Complex Consequences. In Annals of Tourism Research, vol. 6, no. 4.

TRENDS IN DISPERSED RECREATION ON THE WILDLAND RESOURCE

Paul Richard Saunders

Abstract.--Dispersed recreation use will increase at or above population growth rate from 1985 to 2030, while the resource will not increase. Key ecosystem elements that will reflect this use are water quality, fish, vegetation, soil, and wildlife. The increased use will reduce resource durability, resource quality, and recreation experience. To meet these challenges, resource managers will have to identify, monitor, and assess key elements in order to meet goals and objectives and avoid the probable negative trends.

Additional keywords: wilderness, national parks, national forests, recreation opportunity spectrum, planning.

INTRODUCTION

Outdoor recreation management can be divided into two categories, developed recreation and dispersed recreation. Dispersed recreation is characterized by a low density of use over broad expanses of land and water, facilities or developments provided for the protection of the resource, and protection of individual choice through minimal restrictions that reduce conflicts and resource damage (Lloyd and Fischer 1972, Schwartz *et al.* 1976, Lucas 1982). In contrast, developed recreation is characterized by a high density of use over small areas of land and water, facilities provided for the comfort and convenience of the user, and restricted individual choice to reduce conflicts and resource damage. Dispersed recreation occurs in national parks and forests, as well as some state parks and forests, that have wildlands or natural areas that are managed extensively. Developed recreation occurs in city and county parks, and in state and national parks and forests at picnic areas, campgrounds, swimming beaches, ski facilities, and other developments. The developed recreation environment is intensively managed and usually altered from its natural condition.

Dispersed recreation settings may be designated by Congress, e.g. wilderness and wild rivers; designated by a land management agency, e.g. primitive areas, backcountry, and natural areas; or undesignated land managed under the multiple use concept for timber, range, wildlife, water, and recreation. Along the recreation opportunity spectrum (ROS) used in management and planning by the U.S. Forest Service (USFS) and Bureau of Land Management (BLM), developed recreation is in the urban and rural categories, while dispersed recreation is in the roaded natural, semiprimitive motorized, semiprimitive nonmotorized, and primitive categories (Forest Service 1980, 1982). Typical dispersed recreation activities include fishing, hunting, hiking, backpacking, horsepacking, snowmobiling, nordic skiing, sailing, rafting, power boating, and climbing.

This paper will review the demand trends in dispersed recreation with emphasis on federal lands. The main portion of the paper will examine the effect the demand trends will have on the dispersed recreation resource.

DISPERSED RECREATION DEMAND

The trend in dispersed recreation use and demand has and will continue to be one of growth. The Heritage, Conservation and Recreation Service (1979) reported that of all activities which occur on public lands, dispersed recreation has increased the most. Dispersed recreation is the dominant recreational use of federal and state public lands and has become the primary recreation emphasis of the USFS (Forest Service 1976) and the BLM (Homant et al. 1979). During the last decade 62-64 percent of the recreation on national forests has been dispersed (Yang 1985). Over 55 percent of that use is roaded natural and about 15 percent is semiprimitive motorized (Yang 1985). Wilderness use has more than doubled since its inception in 1964, growing to 7 percent of dispersed use on national forests (Forest Service 1984, Yang 1985). Cordell and Hendee (1982) project increased demand for primitive, semiprimitive nonmotorized, and semiprimitive motorized at or slightly above the population growth rate from 1982 to 2000. Wilderness use is also projected to increase at this rate. Roaded natural demand is projected to increase at a much faster rate. Projections to 2000 and 2030 by Hof and Kaiser (1983) indicate the greatest increases will be in snow and ice activities, followed by flat water and stream activities, and last, by land activities. Among the land activities, developed and dispersed camping are projected to increase at rates equal to those for snow and ice activities.

The trend in dispersed recreation supply has not and will not grow in the future. Except for the recent settlement of public land management authority in Alaska, the major public recreation supply agencies (USFS, BLM, National Park Service, Fish and Wildlife Service, Army Corps of Engineers, Tennessee Valley Authority, and state parks and forests) have not increased their acreages in recent decades. The supply of wilderness increased from over 80 million acres by 8.5 million acres under the 98th Congress, but these areas were already managed for dispersed recreation. Thus the supply of public dispersed recreation land will increase in none of the ROS categories and under none of the agencies. Nor is the supply of private dispersed recreation land expected to increase (Cordell and Hendee 1982).

The increased growth in dispersed recreation demand coupled with no growth in the supply of dispersed recreation opportunities will continue to pose significant problems for dispersed recreation managers. The principal problems identified by these managers include land use conflicts, user conflicts, administrative problems, depreciative behavior, inadequate site design, crowding, and ecosystem disturbance (Godin and Leonard 1979, Kissell and Shew 1982). In these studies 80 and 100 percent of the managers, respectively, identified ecosystem disturbance or site deterioration as a major problem. The effects of increased use in relation to disturbance will be examined in several ways.

AN ECOSYSTEM APPROACH

Dispersed recreation occurs in wildlands. Therefore, disturbance should be examined using an ecosystem approach (Odum 1971, Alden 1973). Water is the life blood of an ecosystem, providing moisture and transporting nutrients. Within water are myriads of single- and multicellular organisms, each living in a narrow range of temperature and water chemistry. On the land are plant communities composed of species sensitive to changes in light regimes,

nutrient status, trampling, and increased soil bulk density. Loss of vegetation cover leads to soil erosion despite soil compaction from trampling, the bare soil provides new habitat for invading species, and the loss of soil and nutrients affects water quality. Changes in vegetation cover and the sights, sounds, and smells of humans adversely affect wildlife species. The sensitive indicator elements in this interconnected ecosystem that require our attention include water quality, fish, vegetation, soil, and wildlife. Changes in these elements identify trends in the dispersed recreation environment.

WATER

Increased use in dispersed settings will continue to threaten and reduce water quality. Runoff associated with trampling has caused nutrient loading in lakes (Dickman and Dorias 1977, Liddle *et al.* 1977), altered algal and animal populations in marine environments (Ghazanshahi *et al.* 1983), and caused sediment displacement and beach erosion (Valentine and Dolan 1979). Boating causes bank erosion from motor wash and increases water turbidity which can alter phytoplankton, fish populations, and nutrient concentrations (Yousef 1974, Howard and Stanley-Saunders 1979). An extremely serious problem is water pollution from human wastes (Perrine and Mah 1979, Temple *et al.* 1980, 1982, Potter *et al.* 1984). The spread of *Giardia* in dispersed recreation settings poses a health problem not only to onsite visitors, but also to downstream communities. Water has always been a strong recreation attractor. The growth in water based dispersed recreation activities will put more pressure on limited water resources, threatening further deterioration.

FISH

Few studies have been conducted to determine the effects of recreation on fish populations. However, most lakes and streams are stocked because they cannot support the number and quality of fish that users have come to expect. Fish populations now tend to fluctuate artificially in response to stocking levels and fishing success. Managers are maintaining an unbalanced system to meet already high demands. Documented influences of recreation on fish include off-flavoring of fish from outboard motor exhaust (English *et al.* 1963), and disappearance of sport fish species (Webster 1974). The expected growth in fishing (Cordell and Hendee 1982) will require increased stocking and hatchery expenses as well as a better understanding of aquatic chemistry and population dynamics. Studies are needed to evaluate these unnatural alterations of aquatic communities.

VEGETATION

A large body of literature describes the effect of recreation on plant species and communities. Cole and Schreiner (1981) have summarized the papers published prior to October 1979. Dispersed use often directly affects plants through trampling. Few native species, especially in forest communities, are resilient, with the result that areas become bare and soil erosion occurs. Distinct vegetation zones develop and expand in wider concentric circles around repeatedly used sites. Tree growth rates are often reduced and injury to roots and bark provides an avenue for pathogens. When sites become too "beat out," visitors tend to expand the site or select new areas, expanding the amount of ecosystem disturbance. Increased use also causes increased numbers of disturbed sites as parties seek to recreate in privacy.

Consequently, popular areas such as cirque lake basins or streambanks may be virtually devoid of vegetation. A serious problem associated with bare soil is the habitat it provides for invasion by exotic weed species transported by horses, hikers, and vehicles (Baron et al. 1975, Saunders 1984). The presence of disturbed plant communities and invasion by exotics is particularly troublesome in wilderness, national parks, and biosphere reserves where one congressionally legislated goal is the preservation of quality natural environments.

Hiking and dispersed camping, as noted above, are projected to increase. This means more people using a limited resource, more damage to plant communities, and reduced site quality for dispersed recreation use.

SOIL

Increased dispersed use will cause further soil damage including erosion and subsequent water pollution, nutrient loss, and compaction. Following vegetation, the next largest body of literature on effects of recreation deals with soil (Cole and Schreiner 1981). Studies have found significant changes in bulk density, organic matter, moisture, and erosion rates due to trampling. Other studies have examined the influence of boot sole configurations (Saunders et al. 1980, Kuss 1982), changes resulting from campfires (Fenn et al. 1976), and alteration of microflora (Guegamian 1982) and microfauna (Shugalei and Dmitrienko 1982). Offroad vehicle use is a major cause of soil compaction and erosion (Webb and Wilshire 1983). Loss of vegetation cover and changes in soil properties go hand-in-hand. Increased use and increased soil damage will cause further damage to aquatic environments and their component species due to soil erosion.

WILDLIFE

Wildlife, like water, is a strong attractor in dispersed recreation settings. Hunting is a traditional activity associated with wildlife. Hunting is projected to increase, although not to the use levels of fishing (Cordell and Hendee 1982). Wildlife management for most game species is less of a put-and-take proposition than fish management. Yet vegetation, and therefore ecosystems, are manipulated to support major game species, and controls have been exercised on natural predators.

Another influence of recreation on wildlife, which includes both game and nongame species, is human and wildlife interactions. Roaded dispersed recreation negatively affects elk (Pedersen 1979). There are also documented impacts on mountain goats (Foster and Rahe 1983), marmots (Dearden and Hall 1983), birds (Titus and Druff 1981, Severinghaus and Severinghaus 1982), frogs (Kubansev and Zhukova 1983), and numerous other species (Ream 1979, 1980). Another wildlife problem is habituation to human presence and garbage which can lead to direct confrontations, e.g. black bears and grizzly bears, and impair animal habits and reduce their health, e.g. mountain goats, deer, and ground squirrels (Ream 1980). Projected increases in hunting, hiking, camping, and roaded dispersed recreation will place more pressure on wildlife for both consumptive and nonconsumptive uses. Habitat destruction from projected urban growth will leave wildlands as one of the few places where many species can be observed. Pressures on wildlife and threats to their survival can be expected to increase through this period.

ACID DEPOSITION

A problem that will compound the effects of dispersed recreation use is acid deposition, both wet and dry. Changes in aquatic environments, the lifeblood of the ecosystem, vegetation destruction, and soil chemistry alteration will have serious effects on aquatic, vegetation, and wildlife communities (Evans 1984, Hicks 1984, Linthurst 1984). Species are much more susceptible to human perturbations when growing under stress and acid deposition adds to this stress. Evidence indicates long-term effects from at least the 1950s in Europe, Canada, and northeastern United States. Major dispersed areas that have apparently been affected include Great Smoky Mountains, Adirondacks, White Mountains, and Green Mountains.

DISCUSSION

Dispersed recreation will not degrade or destroy the whole wildland environment, although acid deposition could have widespread effect. Instead, increased use will affect current and additional sites added as users seek new and less crowded areas. The results of these ecosystem disturbances will affect four aspects of dispersed recreation.

First, resource durability will be reduced as a result of increased use. Already many popular dispersed areas show the effects of continued, heavy use. The constant pressure on these ecosystems makes them much more susceptible to additional use pressures and nonrecreational disturbances. Increasing resource durability may mean site hardening, reducing use, or imposing user restrictions. The latter two are in contrast to the tenets of dispersed recreation management.

Second, resource quality will be reduced as a result of increased use. Visitors seek wilderness and national forests and parks because of their high resource quality. Many of the better-known areas are overused, while areas of equal quality with little notoriety may be underused. Unless quality can be maintained, use will have to be rationed and redistributed. This is also in contrast to the definition of dispersed recreation management.

Third, dispersed recreation experience quality will be reduced as a result of increased use. One of the underlying features of dispersed recreation is individual or party solitude in a quality setting. If use becomes too heavy, solitude is compromised. If the resource deteriorates, a quality setting is compromised. The result is that both components of the experience are impacted and the visitor can have a negative experience.

MONITORING AND ASSESSMENT

The fourth trend will be a change in the way dispersed recreation is managed. Recent major land use laws, such as the Forest and Rangeland Renewable Resources Planning Act of 1974, the National Forest Management Act of 1976, and the Federal Land Policy and Management Act of 1976, require ongoing, in-the-field monitoring and subsequent evaluation of the observed changes. Monitoring is a systematic means of studying key ecosystem components to determine the impacts of management and use. Assessment, a better and more encompassing term than evaluation, is interpreting the monitoring data on key ecosystem components so that necessary adjustments can be made to achieve

management goals and objectives. This paper has suggested some of the key elements and examined their trends with increased use. Dispersed recreation managers should follow a six step process of monitoring and assessment. They will need to identify the key elements in their respective areas, select the means of measurement which best describes change, establish baseline data, monitor those elements through time, develop standards and guidelines for assessing the impacts of management and use on the key elements, and adjust their management practices and use levels in accordance with the findings and their goals and objectives. Management is the selection of the best techniques of user and resource manipulation guided by monitoring and evaluation to achieve planning goals and objectives.

Rehabilitation would appear to be a means of mitigating the effects of existing and increased use. Often it has been a last-chance effort to overcome ecosystem disturbance because a monitoring and assessment program was not in place to alert managers. Dispersed recreation sites undergo rapid deterioration during initial use and slower deterioration from subsequent use. However, deterioration or ecosystem imbalance is so complete and environmental conditions usually so adverse that rehabilitation is only moderately successful (Miller and Miller 1976, Zuck and Brown 1976). Rehabilitation or approaches such as sacrifice sites or site rotation are usually unsuccessful because they attempt to treat symptoms rather than causes. Monitoring and impact assessment will be the trend and our best tool for resource protection in the face of increased use.

Dispersed recreation use will cause environmental changes. Legal and regulatory requirements of no change in wilderness and other areas are impractical if the resource is to be used and enjoyed. Education of the public in minimum impact techniques can help reduce use impacts. Guidelines and standards, with input from ecologists, social scientists, managers, and the public, need to be established on a regional or local basis for how much ecological and social change is acceptable in our wildlands. The guidelines and standards will determine the amount of acceptable impact on each ecosystem element so the monitoring and assessment program can incorporate these management constraints.

SUMMARY

Dispersed recreation management can no longer afford to be extensive or complacent or crisis oriented. Use is too great and threats to these limited resources are too serious and often irreversible. The trends of reduced resource durability, resource quality, and recreation experience will require changes in dispersed recreation management. This will include establishment of monitoring and assessment programs, public education, and development of standards that define acceptable impacts to key ecosystem elements.

ACKNOWLEDGEMENTS

Thanks to R. L. Shew for his insights and suggestions. This is Scientific Paper 7021, Agriculture Research Center, Washington State University, Pullman, Washington, Project 0596.

LITERATURE CITED

- Alden, H. R. 1973. Systems for analyzing impacts of outdoor recreation programs on environmental quality. In P. O. Foxx (ed.) Outdoor Recreation and Environmental Quality, pp. 159-173. Fort Collins, CO.
- Baron, J., C. Dombrowski, and S. P. Bratton. 1975. The status of five exotic woody plants in the Tennessee district, Great Smoky Mountains National Park. USDI, National Park Service, Uplands Field Research Laboratory, Gatlinburg, TN. Management Report No. 2. 26 pp.
- Cole, D. N. and E. G. S. Schreiner. 1981. Impacts of backcountry recreation: site management and rehabilitation--an annotated bibliography. USDA, Forest Service, Ogden, UT. General Technical Report INT-121. 58 pp.
- Cordell, H. K. and J. C. Hendee. 1982. Renewable resources recreation in the United States: supply, demand, and critical policy issues. American Forestry Association, Washington, D.C. 88 pp.
- Dearden, P. and C. Hall. 1983. Nonconsumptive recreation pressures and the case of the Vancouver Island Marmot (Marmota vancouverensis). Environmental Conservation 10(1):63-66.
- Dickman, M. and M. Dorias. 1977. Impact of human trampling on phosphorous loading to a small lake in Gatineau Park, Quebec. Journal of Environmental Management 5(4):335-344.
- English, J. N., G. N. McDermott, and C. Henderson. 1983. Pollution effects of outboard motor exhaust--laboratory studies. Journal of the Water Pollution Control Federation 35:923-931.
- English, J. N., E. W. Surber, and G. N. McDermott. 1963. Pollution effects of outboard motor exhaust--field studies. Journal of the Water Pollution Control Federation 35:1121-1132.
- Evans, L. S. 1984. Botanical aspects of acidic precipitation. The Botanical Review 50(4):449-490.
- Fenn, D. B., G. J. Gogue, and R. E. Burge. 1976. Effects of campfires on soil properties. USDI, National Park Service, Washington, D.C. Ecological Services Bulletin 5. 16 pp.
- Forest Service. 1976. Summary: a summary of a renewable resource assessment and a recommended renewable resource program. USDA, Forest Service, Washington, D.C. 29 pp.
- _____. 1980. Recreation input to land and resource management planning. USDA, Forest Service, Washington, D.C. Forest Service Handbook 1909.12, Chapter 500. 45 pp.
- _____. 1982. ROS users guide. USDA, Forest Service, Washington, D.C. 38 pp.

- _____. 1984. Draft environmental impact statement for the 1985-2030 Resources Planning Act Program. USDA, Forest Service, Washington, D.C.
- Foster, B. R. and E. Y. RaHS. 1983. Mountain goat response to hydroelectric exploration in northwestern British Columbia. *Environmental Management* 7(2):189-197.
- Ghazanshahi, J., T. D. Huchel, and J. S. Devlinny. 1983. Alteration of southern California rocky shore ecosystems by public recreation use. *Journal of Environmental Management* 16(4):379-394.
- Godin, V. B. and R. E. Leonard. 1979. Management problems in designated wilderness areas. *Journal of Soil and Water Conservation* 34(3):141-143.
- Guegamian, G. 1982. The influence of human trampling on the soil microflora of periurban forest. *Revue d'Ecologie et de Biologie du Sol* 19(3):345-350.
- Heritage, Conservation and Recreation Service. 1979. The third nationwide outdoor recreation plan. Executive Report. USDI, Washington, D.C. 91 pp.
- Hicks, B. B. 1984. Deposition both wet and dry. Butterworth Publishers, Boston, MA. 197 pp.
- Hof, J. G., and H. F. Kaiser. 1983. Projections of future forest recreation use. USDA, Forest Service, Washington, D.C. Resource Bulletin WO-2. 9 pp.
- Homant, J., A. H. Sievers, and J. J. Rumps. 1979. Recreation management program analysis. USDI, Bureau of Land Management, Office of Program Evaluation, Washington, D.C. 11 pp.
- Howard, G. E. and B. A. Stanley-Saunders. 1979. Impacts of recreation activities associated with streams: a problem analysis. Department of Recreation and Park Administration, Clemson University, Clemson, SC. Research Report No. 16. 58 pp.
- Kissell, J. L. and R. L. Shew. 1982. A problem analysis of dispersed recreation management associated with mountain lake areas within three national forests in Region 1. Proceedings of the 55th Annual Meeting of the Northwest Scientific Association. Walla Walla, WA.
- Kuss, F. R. 1982. The effects of footgear impacts on wildland trail wear. In Southeastern Recreation Research Conference 1980-1981 Proceedings. USDA, Forest Service, Asheville, NC., pp. 165-180.
- Kubansev, B. S. and T. I. Zhukova. 1983. Some ecological results of anthropogenic effects on lake-frog populations and habitat. *Soviet Journal of Ecology* 13(6):393-397.
- Liddle, M. J., C. M. Happey-Wood, and A. A. Buse. 1977. A survey of the biota, environment, and use for recreation of twelve lakes in Snowdonia. *Biological Journal of the Linnean Society* 11(1):77-101.

- Linthurst, R. A. 1984. Direct and indirect effects of acidic deposition on vegetation. Butterworth Publishers, Boston, MA. 117 pp.
- Lloyd, R. D. and V. Fischer. 1972. Dispersed versus concentrated recreation as forest policy. In 17th World Forestry Conference Proceedings. Buenos Aires, Argentina, pp. 3729-3737.
- Lucas, R. C. 1982. Recreation regulations--when are they needed? *Journal of Forestry* 80(3):148-151.
- Miller, J. W. and M. M. Miller. 1976. Revegetation in the subalpine zone. *University of Washington Arboretum Bulletin* 39(4):12-16.
- Odum, E. P. 1971. *Fundamentals of Ecology*. Third Edition. W. B. Saunders Company, Philadelphia, PA. 574 pp.
- Pedersen, R. J. 1979. Management and impacts of roads in relation to elk populations. In R. Ittner, D. R. Potter, J. Agee, and S. Anschell (eds.) *Recreation Impact on Wildlands Conference Proceedings*. USDA, Forest Service, and USDA, National Park Service, Pacific Northwest Region, Portland. R-6-001-1979, pp. 169-173.
- Perrine, R. L. and R. A. Mah. 1979. Water quality in mountain recreation areas. *Water Resources Bulletin* 15(3):612-627.
- Potter, L. D., J. R. Gosz, and C. A. Carlson, Jr. 1984. Water resources in the Southern Rockies and high plains: forest recreational use and aquatic life. *Eisenhower Consortium Institutional Series Report* 6. University of New Mexico Press, Albuquerque, NM. 331 pp.
- Ream, C. H. 1979. Human-wildlife conflicts in backcountry: possible solutions. In R. Ittner, D. R. Potter, J. Agee, and S. Anschell (eds.) *Recreation Impact on Wildlands Conference Proceedings*. USDA, Forest Service, and USDI, National Park Service, Pacific Northwest Region, Portland. R-6-001-1979, pp. 153-163.
- _____. 1980. Impact of backcountry recreationists on wildlife: an annotated bibliography. USDA, Forest Service, Ogden, UT. *General Technical Report INT-84*. 72 pp.
- Saunders, P. R. 1984. Recreational impacts in the Southern Appalachian spruce-fir ecosystem. In *Southern Appalachian Spruce-Fir Ecosystem: Status, Threats and Management Proceedings*. USDI, National Park Service, Atlanta Region.
- Saunders, P. R., G. E. Howard, and B. A. Stanley-Saunders. 1980. Effect of different boot sole configurations on forest soils. Department of Recreation and Park Administration, Clemson University, Clemson, SC. *Extension/Research Paper RPA 1980-3*. 11 pp.
- Schwarz, C. F., E. C. Thor, and G. H. Elsner. 1976. *Wildland planning glossary*. USDA, Forest Service, Berkeley, CA. *General Technical Report PSW-13*. 252 pp.

- Severinghaus, W. D. and M. C. Severinghaus. 1982. Effects of tracked vehicle activity on bird populations. *Environmental Management* 6(2):163-169.
- Shugalei, L. S. and V. K. Dmitrienko. 1982. Effect of recreation loads on the biological activity of soil in pine stands. *Soviet Journal of Ecology* 13(4):242-246.
- Temple, K. L., A. K. Camper, and G. A. McFetters. 1980. Survival of two enterobacteria in feces buried in soil under field conditions. *Applied and environmental Microbiology* 40(4):794-797.
- Temple, K. L., A. K. Camper, and R. C. Lucas. 1982. Potential health hazard from human wastes in wilderness. *Journal of Soil and Water Conservation* 37(6):357-359.
- Titus, J. R. and L. W. VanDriff. 1981. Response of the common loon to recreation pressure in the Boundary Waters Canoe Area, northeastern Minnesota. *Wildlife Monographs* No. 79. 59 pp.
- Valentine, S. and R. Dolan. 1979. Footstep-induced sediment displacement in the Grand Canyon. *Environmental Management* 3(6):531-533.
- Webb, R. H. and H. G. Wilshire. 1983. Environmental effects of off-road vehicles: impacts and management in arid regions. Springer-Verlag, New York, NY. 534 pp.
- Webster, L. F. 1974. Cottage country: an environmental frontier. *Water Pollution Control* 112:12-15.
- Yang, T. 1985. Recreation information management system. USDA, Forest Service, Washington, D.C. Personal Communication.
- Yousef, Y. A. 1974. Assessing effects on water quality by boating activity. U.S. Environmental Protection Agency, Cincinnati, OH. Environmental Protection Technology Service. EPA-670/2-74-072. 60 pp.
- Zuck, R. H. and L. F. Brown. 1976. Proceedings of Revegetation of high-altitude disturbed lands workshop Number 2. Environmental Resources Center, Colorado State University, Fort Collins, CO. Information Series 21. 128 pp.

RECREATION TRENDS AND MANAGEMENT
OF THE BOB MARSHALL WILDERNESS COMPLEX

Robert C. Lucas

Abstract.--Trends over 12 years in the Bob Marshall Wilderness complex include: slowing growth in use, a shift in predominant travel methods from horses to hiking, and growing complaints about trail conditions and user conflicts. The potential for impacts on a per-party basis has decreased, providing managers with an opportunity to catch up.

Additional keywords: Use distribution, satisfaction, attitudes, user conflict, solitude, impacts.

INTRODUCTION

Knowledge of outdoor recreation trends is useful for management of any type of area, including wilderness. Knowledge of trends takes on special importance in wilderness because the Wilderness Act (Public Law 88-577) requires managers to preserve essentially unmodified natural environments and provide visitors opportunities for primitive recreation and solitude. But comparisons of existing to desired conditions provide only limited guidance to managers. Trend information is also needed to identify which conditions are stable, improving, or worsening to enable managers to allocate limited budgets and scarce personnel. This becomes particularly essential in more structured, systematic management systems such as the limits of acceptable change (LAC) scheme (Stankey and others 1985).

Although knowledge of trends in most types of outdoor recreation settings is poor, it is particularly scarce for wilderness. A number of features of wilderness and its recreational use contribute to this scarcity: relatively light, widely dispersed use; limited opportunities for systematic observation by managers; basic use estimates of low accuracy; noncomparability of units of measure among agencies and before and after 1964; and high expenses for visitor surveys.

Only a few wilderness trend studies have been published. There is only one study of trends in total wilderness recreational use--an analysis of use of the national forest component of the National Wilderness Preservation System by Petersen (1981), which reported the average annual rate of growth in use since passage of the Wilderness Act in 1964 as about 4 percent, with faster growth early in this period and slower growth more recently.

Providing managers with data on attitudes and most use and user characteristics requires some type of survey research. Present federal policies on questionnaire review and approval make systematic survey research for management purposes difficult. This handicaps wilderness managers in meeting their legal obligations under the Wilderness Act that wilderness areas "shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness" The substantial values at stake in the very large area dedicated to wilderness make this handicap seem particularly unfortunate.

Studies of trends in use and user characteristics are as scarce because of questionnaire policies, the difficulties of survey research in wilderness, and the rarity of long-term research programs. I found only three. The first is a study on the Allagash River in Maine, a State wilderness waterway (Cieslinski 1980). Parties there became smaller and stays shorter, and the total number of parties doubled from 1966 to 1979. Visitor surveys in 1973 and 1978 covered only a few characteristics and showed small changes in most. By 1978, in proportional terms, there were slightly more out-of-state visitors, fewer fishermen, more canoeists, and fewer large parties than in 1973. The second is a study of visitors to the Rattlesnake area north of Missoula, MT, that became part wilderness and part national recreation area in 1980, carried out in 1977 and 1978, and repeated in 1981 (Corti and others 1982; McCool 1985). Total use decreased, groups became smaller, there were no changes in proportions of male and female visitors, occupations, or education, and only a slight tendency for later visitors to have less previous experience in the area. The third is a study of use of the backcountry of Yosemite National Park (van Wagtenonk 1981) where total use grew rapidly to 1975 and then declined. Some trends in use and user characteristics were identified from two independent surveys of backcountry visitors conducted only 2 years apart in 1973 and 1975-76; little change in party size, length of stay, visitor age, education, and income, but a larger proportion of female visitors. Use at the end of the period was a little more evenly spread over the calendar and the map than at the beginning.

These surveys investigated just a few characteristics of use and users--none of them reported attitude data, for example--and covered only short time periods, thus providing a limited view of trends.

A more complete picture of wilderness trends is reported here, based upon comparable visitor surveys carried out in 1970 and 1982 in the Bob Marshall Wilderness complex in Montana. This study, like the others reviewed, has only two data points, which indicate changes but cannot document the shape of trend lines. The complex consists of three large, contiguous wildernesses, the Bob Marshall (1,009,000 acres), the Great Bear (287,000 acres), and the Scapegoat (239,000 acres), for a total of over 1-1/2 million acres. The area straddles the Continental Divide south of Glacier National Park, and contains high mountains, two large rivers, the South and Middle Forks of the Flathead River, which are floated by some visitors, and substantial populations of elk, deer, and grizzly and black bears, with considerable big game hunting use.

The Bob Marshall complex is a major wilderness resource. Max Peterson, Chief of the Forest Service, recently called the Bob Marshall Wilderness the "Flagship of the National Forest Wilderness System." It is probably as well known nationally as any wilderness, perhaps partly because it is named after one of the founders of the wilderness movement. Compared to most wildernesses, it has had more horse use and more hunting use, with a larger proportion of visitors traveling with outfitters, and longer stays, but may reflect more widespread trends.

METHODS

Summer and fall visitors were contacted at trailheads and asked to supply their names and addresses, which almost all did. The resulting lists were subsampled and selected visitors were mailed a questionnaire. The sampling

frame was individual visitors 16 or older. In 1970, 91 percent of the questionnaires were returned, 502 in total. In 1982, 82 percent were returned, 746 in total. Comparable areas and periods were covered both years with only minor exceptions, and most of the questions were identical both years. Further details on sample design are found in Lucas (1980, 1985).

RESULTS

Use Characteristics

Total numbers of visitors grew about 60 percent over 12 years, for an annual average of 4 percent--about the same as the national growth rate for national forest wilderness use (Petersen 1981). Use by hikers grew much more rapidly than use by visitors riding horses. Over 90 percent of Bob Marshall Wilderness visitors were estimated to be using horses in 1960 (ORRRC 1962); by 1970, use of the three-wilderness complex was split about three to two in favor of horse users versus hikers; by 1982 the hikers were in the majority by about three to two (table 1). Horse use grew, but only about 20 percent in 12 years, while hiker use, most of it camping use rather than day hiking, more than doubled.

Table 1.--Method of travel in the Bob Marshall complex, 1970 and 1982

Year	Percent of total individual visits				
	Hike	Horseback	Hike with packstock	Raft	Other
1970	40	49	6	3	2
1982	57±7 ^a	36±7	3±1	3±2	1±1

^aStatistical confidence interval at the 95 percent level for 1982; not available for 1970 data.

This major change in type of use is reflected in changes in some other characteristics of use, users, and attitudes, while other variables remained stable.

Average length of stay declined slightly, as in several of the other wilderness trend studies, from 5.1 days in 1970 to 4.7 days in 1982. Average party size also went down, from 4.9 to 4.3. Outfitters served a smaller proportion of visitors in 1982, 17 percent compared to 31 percent in 1970. Most outfitters' guests ride horses, and the proportion of visitors riding horses using the services of outfitters also declined, from 51 percent to 36 percent. The proportion of visitors hunting dropped substantially, fishing declined slightly, and hiking, photography, nature study, and swimming all grew slightly, a small shift from consumptive to contemplative activities (table 2). In 1982, visitors depended less on wood fires, which can cause high impacts. In 1970, only 23 percent of the campers had a campstove, while the rest were

totally dependent on a campfire; in 1982, 44 percent had campstoves. The proportion of visitors with stoves grew for both horse parties and backpackers, although a higher proportion of backpackers used stoves both years compared to horse users.

Table 2.--Activities participated in in the Bob Marshall complex, 1970 and 1982

Year	Percentage of total visits involving activity								Average number of activities
	Fish	Hunt	Hike	Photography	Nature study	Mountain climb	Swim	Other ^a	
1970	61±8	32-- ^b	60--	56--	26--	0.3--	11--	17--	2.7--
1982	57±7	16±7	68±5	61±5	28±5	.8±1	17±4	15±3	2.6±0.1

^a"Other" was made up mainly of rafting and of people flying to the Schafer airfield in the Great Bear Wilderness who had no appreciable ground travel.

^bConfidence intervals not available for any activities in 1970 except fishing.

Most visitors place a high value on observing wildlife and most of them saw some of the major wildlife species--elk, deer, black and grizzly bears, mountain goats, bighorn sheep, and moose--both years. However, the proportion seeing elk, black bear, and moose dropped, and 30 percent reported no sightings of these large animals in 1982 compared to just 17 percent in 1970. The proportion of hunters taking elk dropped from 24 percent to 18 percent and deer hunter success also declined from 1970 to 1982.

The concentration of use in the summer increased over the 12 years from 66 percent to about 80 percent, but weekend peaking declined, with 58 percent of all arrivals in 1982 taking place on weekends (including Fridays), compared to 69 percent in 1970. Use was more evenly distributed spatially in 1982 than earlier, although still quite concentrated. In 1970, the three most used trailheads in each wilderness accounted for most of the total visits to that area: 75 percent in the Bob Marshall, 99 percent in the Great Bear, and 85 percent in the Scapegoat. In 1982 these percentages dropped to 57, 60, and 64, respectively. Trips tend to be long, averaging about 30 miles round trip in both years, based on measurement of routes sketched on questionnaire maps. Off-trail travel was rare, due to steep, heavily forested terrain. Visitors in 1970 tended to occupy one base camp--only 30 percent camped at more than one spot; but in 1982, 54 percent camped at several places, probably due to the increase in use by backpackers who usually cover fewer miles per day than horse parties, and a smaller proportion of hunters who often hunt from one base camp.

Visitor Characteristics

A majority of visitors to the Bob Marshall complex were from Montana both years, but a larger proportion came from other states in 1982, especially from the northeastern quarter of the United States. The percentage from urban areas was little changed, up to 68 percent from 65 percent in 1970. The proportion of female visitors grew, up from 20 percent in 1970 to 30 percent in 1982. The distribution of different types of social groups, families, groups of friends, etc., was virtually identical both years, with families most common.

Age distributions were nearly the same both years; almost half of all visitors were 25 to 44 years old. Education levels were very high in 1970 and even higher in 1982 (table 3). Professional-technical occupations were most common and, again, this was even more true in 1982 than 1970.

Table 3.--Education level distribution, Bob Marshall complex, 1970 and 1982; for the U.S. population and Montana, 1970 and 1980

Area	Year	0-8	9-11	12	13-15	16 or more ^a	(17 or more) ^b
- - - percentage of total visits - - -							
Bob Marshall complex	1970	4	13	24	18	41	(28)
	1982	2	7	22	23	47±5	(26)
United States population ^c	1970	28	17	34	10	11	(NA)
	1980	17	14	37	15	17	(NA)
Montana population ^c	1970	25	16	34	14	11	(NA)
	1980	14	11	38	19	18	(NA)

^aCollege graduates, usually.

^bGraduate study, in most cases, also included in totals for "16 or more."

^cBased on persons 25 years of age or older.

A large majority of visitors both years did not belong to any conservation or outdoor recreation clubs, and less than 10 percent belonged to any wilderness-oriented club.

Most visitors have visited some wilderness before (78 percent both years), but in 1970, over half had visited the Bob Marshall complex before; in 1982, most were newcomers, which may account for some attitude shifts.

Visitor Attitudes

Both years about three-fourths of all visitors said wilderness was "extremely important" to them, with little change over time. Motives for visiting wilderness show some small shifts in the same direction as

activities, towards more contemplative, less consumptive appeals. Motives related to hunting and fishing were down; those associated with scenery, relaxation, and escaping civilization were up in 1982.

Overall satisfaction levels were high both years, with almost no change. Satisfying factors were about the same both years, with scenery, natural environment, good hunting or fishing, and lack of crowding the leading reasons--in that order. Sources of dissatisfaction were quite different in 1982 than in 1970, however; complaints about poor trails were six times as common in 1982, and comments about crowding and visitor conflicts were three times as common in 1982 as in 1970.

Solitude levels were high, but dropped slightly over the period. In 1970 the average party of campers (excluding day users) met an average of only 1.0 other parties per day; in 1982 this average had increased to 1.2 parties per day, still low compared to most wildernesses. Encounters increased less than total use, probably because of more even distribution and timing of use, some of which may have been a deliberate attempt to seek solitude. Opinions of numbers met were almost identical for the 2 years, with most saying "about right." Opinions of numbers met were fairly strongly associated with average number met per day as measured by gamma--for campers, 0.54 in 1970, and 0.50 in 1982. (Gamma is a measure of association between two variables measured on an ordinal [ranking] basis. It can be interpreted as the proportion of variance in one of the variables accounted for by the association with the other variable, similar to R^2 .) The increased complaints about "crowding and conflict" cited earlier apparently refer more to conflict than to crowding, particularly hikers' negative reactions to horses and their impacts.

Most visitors prefer no one else camped near them. Visitors in 1982 were slightly more tolerant of other campers, but still reported more difficulty finding their desired degree of campsite solitude.

Visitors who had been to the Bob Marshall before were asked to compare overall conditions with those they experienced before. "Getting worse" comments were less common in 1982. Litter, in particular, was viewed as much improved. In contrast, soil and vegetation impacts were perceived as worsening. Deterioration of trails again figured in opinions.

Except for trails and bridges, attitudes shifted toward a more purist position, with less support for facilities. Minimum impact camping practices were better accepted. There also was much more support for allowing natural fires in wilderness. Attitudes about specific potential regulatory policies were unchanged. The concept of rationing was accepted, but assigning campsites was strongly rejected. Party size limits were supported, but prohibiting camping within 200 feet of water was not.

DISCUSSION

The Bob Marshall complex has evolved from a wilderness with predominantly horse use into mainly a backpacking area. This shift, which I believe is occurring at many other western wildernesses, is associated with other changes--smaller parties, shorter stays, more even use distribution, less hunting, more campsites used but with shorter stays at each campsite, and, unfortunately, more conflict between various types of users. Many of these

changes result in lower potential for impacts on a per-party basis. In addition, the decreased dependence on wood fires reduces impact potential. Reduced weekend peaks reduce social impacts (crowding and conflict). Less concentrated use also tends to reduce social impacts but may spread some environmental impacts.

Many trends suggest that wilderness managers have a chance to catch up with the management challenge. Often, managers have felt overwhelmed as use grew rapidly, conditions deteriorated, and problems compounded. Many felt that they rapidly were falling farther behind despite their efforts. This no longer seems to be the case in the Bob Marshall complex and perhaps not in a number of other areas. The rate of growth in use is only moderate and may be slowing down further due to slower growth and aging of the general population, and less growth of educational levels. Use patterns have shifted toward lower impacts, visitors are better informed, and litter has lessened. If managers can solve the problems they face, they need not fear being overrun quickly by new problems.

Interpreting the significance of 1982 data for the Bob Marshall Wilderness complex would be much more difficult for managers without the 1970 information to show direction and magnitude of change. The trend analysis shows some successes (litter conditions, for example), much stability (such as opinions of crowding), small deterioration in some factors (levels of solitude experienced by visitors), and several more serious problems (discussed below).

The main problem in the Bob Marshall complex perceived by visitors is deterioration of trail conditions; all types of visitors agree on this. Lack of resources to maintain, reconstruct, and relocate trails have led to the situation producing discontent, and the solutions will require money and personnel, both of which managers find scarce now.

Campsite impacts are also a serious problem in the visitors' view. Closure of some poorly located sites, their replacement by more durable sites, and continued stress on visitor education seem to be the main approaches to solution (Cole 1983).

Visitor education has several advantages with wilderness users, as illustrated by study results from the Bob Marshall Wilderness complex. Very high education levels and very high personal commitment to wilderness shown in the study are advantages for visitor education programs. Many of these visitors live nearby, facilitating contact for education programs. A majority of them are new to the area, however, which offers a challenge. The improvement in litter conditions, the greater awareness of recommended camping practices, and the increased acceptance of natural fire all represent payoffs from national forest education programs emphasized in the last few years, and suggest the desirability of continuing and expanding the use of education as a management tool.

The Bob Marshall complex still provides opportunities for high quality wilderness experiences, with good opportunities for solitude and wildlife observation, and overall satisfaction high, but there is cause for concern in some of the changes identified. The challenge of keeping wilderness wild can be met best with knowledge of trends in important characteristics of use and users. To accomplish this, as a starting point, certainly more accurate basic

use estimates are needed. But basic data on numbers of groups, group size, length of stay, and method of travel are not enough. Managers also need information on visitor activities, camping practices, satisfactions, dissatisfactions, and related attitudes. Comprehensive knowledge of trends in wilderness recreation is essential for effective management of not only the Bob Marshall complex but also the 88 million acres now classified as wilderness in the United States.

LITERATURE CITED

- Cieslinski, T. J. 1980. Trends in Allagash Wilderness Waterway uses. In Proceedings 1980 national outdoor recreation trends symposium, p. 147-149. USDA Forest Serv. Gen. Tech. Rpt. NE-57, Vol. II. Northeastern Forest Exp. Stn., Broomall, PA.
- Cole, D. N. 1983. Campsite conditions in the Bob Marshall Wilderness, Montana. USDA Forest Serv. Res. Pap. INT-312, 19 p. Intermtn. Forest and Range Exp. Stn., Ogden, UT.
- Corti, A., Petersen, M. E., and McCool, S. F. 1982. Trends in recreational use of the Rattlesnake National Recreation Area and Wilderness: a test of the designation hypothesis, 11 p. A report submitted by the University of Montana to the Wilderness Management Research Unit, Intermtn. Forest and Range Exp. Stn., Missoula, MT.
- Lucas, R. C. 1980. Use patterns and visitor characteristics, attitudes and preferences in nine wilderness and other roadless areas. USDA Forest Serv. Res. Pap. INT-253, 89 p. Intermtn. Forest and Range Exp. Stn., Ogden, UT.
- Lucas, R. C. 1985. Trends in wilderness use patterns, visitor characteristics, and attitudes in the Bob Marshall Wilderness complex. USDA Forest Serv. Res. Pap. INT-____. Intermtn. Forest and Range Exp. Stn., Ogden, UT. [in press].
- McCool, S. F. 1985. Does designation increase recreational use? J. Forestry 83(1): 39-41.
- ORRRC (Outdoor Recreation Resources Review Commission). 1962. Wilderness recreation--a report on resources, values and problems. Study Rpt. No. 3, 352 p. Washington, DC: U.S. Government Printing Office.
- Petersen, M. E. 1981. Trends in recreational use of National Forest wilderness. USDA Forest Serv. Res Note INT-319, 3 p. Intermtn. Forest and Range Exp. Stn., Ogden, UT.
- Stankey, G. H., Cole, D. N., Lucas, R. C., Petersen, M. E., and Frissell, S. S. 1985. The limits of acceptable change (LAC) system for wilderness planning. USDA Forest Serv. Gen. Tech. Rpt. INT-176, 37 p. Intermtn. Forest and Range Exp. Stn., Ogden, UT.
- van Wagtenonk, J. W. 1981. The effect of use limits on backcountry visitation trends in Yosemite National Park. Leisure Sciences 4(3): 311-323.

MARINE RECREATION: AN UPDATE OF EFFECTIVE USE OF THE SEA

Tal Morash
Professor of Recreation Resources
Department of Recreation & Leisure Studies
California State University, Northridge
Northridge, CA 91330

Abstract. Mankind's long attraction to the sea and its adjacent shorelines continue to draw larger numbers of recreational users as population increases and the public is placing higher values on travel, vacations, tourism, and outdoor and marine recreation activities. Recent changes in the structure and attitudes toward life styles offer some keys to the future needs of society itself and an increasing need for more comprehensive planning to permit development that allows maximal use of the coastal and ocean areas without deleterious impacts on the resources themselves. New and developing recreational facilities and activities will be examined to illustrate the recent technological advances in recreational use of wasterwater ponds and lagoons, underwater parks and preserves, fish farming for recreational uses, offshore "floatels", recreational programs and services, and the potential colonization of some portions of the sea.

Introduction. People seek out recreation in order to relax and find release from tension and stress from the complications of urban living and the forces thus generated. Therefore, individuals searching for relaxation through leisure-time activities try to avoid areas that are overcrowded in order to find a restful, peaceful, and healthful environment. One of the reasons for this has been identified by Niels Rorholm, Professor of Resource Economics at the University of Rhode Island, stating a major characteristic as one in which "marine use is rich in variety and consumers appear to have a variety of wants for different types of marine recreation that is at least equal to the ability of the sea to provide it." (9) That variety includes swimming, sunbathing, snorkeling, underwater photography, fishing, diving and wreck diving, surfing, boating and racing, sailing, and water skiing. More recently, the activities have grown to include underwater caving, water kiting (paraflying), sailboarding, jet skiing, and shallow water surfing on boogie boards. Each of these sports requires adequate spacing of areas and freedom from crowding that otherwise could destroy the values of the recreational experience being sought.

Current Status. In 1982 Americans spent \$7.8 billion dollars for new and used boats, accessories, safety equipment, docking, maintenance and repairs. Increased boat sales are predicted for 1983 based upon the February Boat Show held in Michigan which reported \$12.7 million dollars in sales. The majority of those boats were in the power category and 20-30 foot range. Approximately 15% of the total sales were for sailboats, reports Boating Industry Magazine in May 1983. The U.S. Coast Guard reports that one family in four now is into boating and that one-third of all the people on the water at a given time have never been on it before. Growing most rapidly are surfing and sailboarding with sales up 25%.

The August 10, 1981 issue of U.S. News and World Report included a nine page special section devoted to "Our Endless Pursuit of Happiness," stating that fun-seeking U.S. spends more on leisure than it does on defense—an estimated \$244 billion dollars in 1981. Currently, leisure activities account for \$1 in every \$8 spent by American consumers here, while foreign visitors last year added another \$12 billion. During the recession in 1980, sporting goods sales increased to \$8.6 billion, up from \$8 billion in 1970. (11)

Additional documentation from the respected A.C. Nielsen Company, producers of the Nielsen Surveys, indicates that the U.S. Census Bureau, the National Park Service, and the U.S. Forest Service further substantiates the continued strong interest in outdoor recreation activities. (7)

Societal Attitudes and Changes. Let's examine the major issues developing in society -- they are largely intangible, basically a shifting of attitudes -- they are a people factor, needing our attention.

First, an overwhelming move to conservatism -- to the right. An example almost worldwide is fiscal conservatism, touching practically every level of government as less financial resources become available and further characterized by fewer people to serve an increasingly larger number of users.

Second, a substantial impact on the costs of energy has been felt at every level of government, business, industry, and agriculture, as well as in our personal lives.

Third, "Future Shock" is here now and we have a rapidly changing clientele. We are almost at zero population growth, and the U.S. Census data indicates a larger population of older people, accompanied by a decreasing population of children and youth of junior high and high school levels. Some counties across the nation reported that 45% of their total population is now over 40 years of age. Further, that 70% of the U.S. population was living in urban areas in 1980. Larry Booda, editor of Sea Technology, states this is due to the fact that the sea, from earliest times, has met many human needs such as food from the sea, and an effective mode of travel with access to trade on a world-wide basis. (1) This intensive population concentration documents the urgent need for precise research on coastal planning problems and changing uses in the face of growing demands on diminishing land areas.

Needs and desires for different types of recreation services are being expressed openly. Currently there are no major sports arenas on the drawing boards except in very large urban areas. Theme parks are being redesigned for older people and will probably not include roller coasters and similar "high-thrill" activities.

The users are more highly educated -- over one-half of the youth in America are now attending colleges and universities and should have jobs reflecting higher income levels upon graduation.

Family units are no longer as strong as they were. A recent study by George Masnich and Mary Jo Bane at MIT-Harvard Joint Center for Urban Studies examined trends in family structure, composition of households, and employment. The most striking trends noted are:

- * In the next decade households made up of married couples will increase slightly, while single persons and single-head households will show a large increase.
- * Greater continuity of employment promises to increase the relative contribution of working wives to family income from the current 25%.
- * Single women headed households, with and without children, will continue to increase dramatically.
- * Most dramatic change in household composition is expected in the increase in single-head households from 35% in 1960 to 57% projected in 1990.

The trend seems to be away from the family in which there is one worker per couple — a drop from 43% in 1960 to an anticipated 14% in 1990. Women are the basis of the change, as employed wives and employed singles. The singleness also doubles the proportion of employed men living alone.

Women are also having fewer children and are having them later in life and about 20% of younger women do not plan to have children at all. The proportion of women having four or more children is dropping to less than 10%. (6) Much of this is related to the changing role of women, for they are not tied down as much as they used to be. Currently, 51% of all women 16 years of age and older work and it is anticipated by Economic Research Associates that during the next decade women will comprise 42% of the work force.

Changes in our lifestyles and family structure will have varied impacts on recreational users and their demands upon the resources, and especially upon the oceans, coastlines, bays, and estuaries which are all routes to the sea and opportunities for marine recreation. Our coasts and oceans are an economic resource capable of dwarfing our greatest fiscal efforts and making our fertile fields seem impoverished. Thus, the recreational values of our beaches, shores, and adjacent waters will take on new meanings and greater values in the future.

Facilities, Planning & Management. People who picnic, hike, camp, and pursue other land-based activities are also attracted to the ocean and the water's edge by the sense of openness, cool breezes, and beautiful scenery both around and beneath the ocean's surface.

The sound of the surf and the vastness of the sea make coastal waters very special. One of the main stated reasons people recreate is to relax and find relief from stress and tension, however, when the individual seeking relaxation through the recreation activity finds that recreation space is overcrowded, expectations are thwarted and the stress/tension levels rise, rather than offering a pleasant, relaxing experience.

When facilities in a given area are not attractive or are heavily loaded, the user will move on to more desirable facilities in other areas because geography is not a barrier and outdoor recreation cannot be viewed as a local matter. High quality facilities are generally the recipient of excessive demands, while lesser facilities are under-utilized. Distance becomes a prime factor in the consumption of marine recreation activities, even when they are "free" because the user must find transportation to the activity and this involves monetary considerations. One must also calculate the time factor involved for time and money are usually not unlimited. The user must then calculate and measure the satisfaction level of the anticipated activity against all other possible uses to which time and money might be used.

Wise management of the resources is dependent upon adequate research to determine just what it is the user desires in the way of activities in order to develop a sound management plan that has balanced the potential of overcrowding against a cost-benefit ratio to handle the allocations of space. Such perceptive management is essential to sustaining high quality in marine recreation programs that are serving increasingly large numbers of participants in a wider variety of activities than ever before — and all related to significant economic planning, physical site implications and potential multiple-use conflicts. Planning for these marine activities is socially, emotionally and economically most important in today's complex world of pressures. Coastal shorelines with great recreation potential also are attractive for various competing economic uses. Private residential development, hotels, townhouses, refineries, pipelines, terminals, and marinas are all drawn to coastal land where land costs are measured by the frontage foot. Conflicts among user groups require perceptive planning based upon sound

research, which at this point in time has not been adequately developed.

Unless this process is carefully and precisely carried out, beach recreation could be adversely affected, as Gardner M. Brown states, "by conventional forms of pollution from the shore causing closure of beaches to water contact sports, changing coastal land use and development may exclude beach usage; sea-wall construction or dredging of channels may modify currents and sand deposition and degrade beach resources. It is thus necessary to understand the recreational value of the beach as a recreation site in order to compute the benefits of protecting a beach from these adverse impacts. Beaches provide other services besides recreation, for example, protection from flooding and erosion of land areas behind the beach. These protective functions may be degraded by a variety of activities including over-extensive development and utilization of the beach for recreation, alteration of sand movements, and changes in land use. Such factors must be considered in the determination of the total economic value of beaches. (2)

Underwater Parks & Reserves. One of the interesting developments in marine recreation has been the growth and development of underwater parks and reserves which were first established in the 1970's on the Monterey Peninsula in California and at the John Pennecamp Coral Reef Park in Florida. (3,12) The objectives of such programs provide protection of the resources while permitting participation in marine activities and nature interpretation programs. Canada, Japan, Australia, Israel, the Philippines, and Mexico have also established underwater parks which emphasize recreation, education, and tourism.

The State of California Underwater Parks provide us with some data as to the economic impacts from this form of marine recreation. Currently, there are over 550,000 certified divers in California, representing 37% of all certified divers in the nation, and 20,000 new active divers become users of the oceans resources annually. Standard and Poor's Industry Survey indicated these divers spend over \$30 million annually on scuba diving equipment and another \$30 million on related services; i.e., instruction, boat trips, tours, and round-trip transportation to underwater sites. A 1980 poll of leisure activities in the United States indicated that one percent of all Americans participate in SCUBA diving and twice that number (2%) snorkel.

The State of California provides eleven marine park units and one inland underwater unit at the present time, with an additional 23 units under consideration. Facilities range from primitive to those with separate divers' facilities, lockers and dressing areas. At the Point Lobos Underwater Unit, divers may use an Underwater Guide to animals frequently seen. Printed in full color with concise descriptive data, the flip charts are plastic laminated for full waterproofing and are carried on the dive as an excellent educational tool to enhance and enrich the total diving experience.

It is planned to expand the Interpretive Program to include on-site visitor centers and related orientation facilities. Most visitors to the underwater parks are non-divers. Therefore, the use of closed circuit television that displays the sea life, divers, and diving rangers giving nature talks would be valuable. The coastline walk with the interpretive rangers provides additional information. The addition of a transparent plastic tube-tunnel from the shore out to shallow areas would permit non-diving visitors and the handicapped to have first-hand experience into the sea world. Japan's tourist-oriented marine parks offer such an experience now, and advancing plastics technology makes the project more economically feasible.

Where land is owned by the state, total facility costs would range from a low of \$26,000 where restrooms and parking exist, to a high of \$180,000 where no support facilities exist. Staffing is composed of a minimum of two person dive

teams, who also may serve as lifeguards. Initial operating equipment for one "dive team" ranges from a low of \$3557 to a high of \$4505. Staff training for these specialized recreation technicians includes special training for diving that has been provided by Scripps Institution of Oceanography at no fee with transportation and per diem subsistence at a cost to the state at an average of \$500 per person. These rangers all have prior training as lifeguards and in first-aid. Extra pay is allowed for required diving after certification and is at the rate of \$5 an hour for the ranger class. (3)

The California Department of Fish and Game estimated that 132,000 skin divers and 68,000 shore pickers removed between 1.5 and 2 million pounds of abalone from the Sonoma-Mendocino coast during 1977. The estimated ratio of 3.2 to 3.4 abalone per diver represents an annual take of over 422,000 abalone. A minimal price of \$15 a pound for the 2 million pound harvest represents over 30 million dollars of abalone. One can see the economic value of this marine resource as well as the pressures exerted on the marine environment from too much use of the resource too frequently. (8)

Historical Reserves. An even more specialized form of underwater park is Truk Lagoon, one of two existing historical reserves protecting shipwrecks. Truk Lagoon Historical Monument is located in the Caroline Islands (a U.S. trust) in the South Pacific. The other historical reserve is Fathom Five Underwater Park in Tobermory, Ontario, Canada, with its boundaries both in Lake Huron and Georgia Bay. This 45 square mile park, established in 1970, contains 18 shipwrecks that are easily viewed through crystal clear water, plus a dive center and interpretive center. It draws over 250,000 non-diving visitors annually, and provides one of the few sources of revenue to the Island.

Role of Marine Recreation. Marine Recreation, a relatively new ocean specialization to many, is a viable and natural partner with the hard sciences due to its common base, the oceans. In addition, there are shared interests in the impacts people make on the marine environment and the need for research and information as to the impacts and relationships between marine resources and recreational/leisure users. The Marine Technology Society has recognized such factors and has established this past year a Marine Recreation Committee within its operational structure in order to provide greater cooperation and sharing of research and common concerns.

Wastewater Recovery and Recreation. Another area where shared information may provide greater economic and recreational benefits is in the areas of wastewater treatment, aquaculture, and recreational fishing using common water sources. A recent study investigated the performance of an aquaculture-type of wastewater treatment system for the treatment and potential reuse of wastewaters. The process is designed as a more controlled, manageable process, in comparison to conventional oxidation lagoons or aquaculture (food production) ponds in order to achieve the essential stability and reliability of treatment required for wastewater reuse situations. The system consists of a multiple series of lagoons, with a two-stage, covered anaerobic lagoon for primary treatment, followed by a series of facultative and aerobic lagoons for secondary and advanced treatment and by-product production. Each of the lagoons contain high surface area bio-film substrates, while the aerobic lagoons also contain diffused aeration, floating aquatic macrophytes such as water hyacinths and duckweeds, and food-chain invertebrates for concentration of nutrients.

For this study, a 3,000 gallon-per-day pilot scale unit consisting of two anaerobic and three aerobic cells was constructed and operated in Cardiff, California over a two-year period. Results showed the system was capable of

treating raw sewage to secondary quality on a reliable basis within two days retention time. Advanced treatment, in the form of 95% suspended solids reduction, 90% BOD reduction, and 50% total nitrogen removal, could be reliably achieved within 4-5 days retention time. Phosphorus was reduced only by about 1% in 5 days, due to the limited demand for this nutrient by aquatic biota. Toxic compounds typical of domestic sewage, including heavy metals and chlorinated hydrocarbons, were spiked into the sewage and their removal rates studied to determine the feasibility of the process for pretreatment and use of sewage for aquatic food production. Results indicate that removal rates within 5 days retention time are adequate to allow reuse of effluent for food production, provided influent concentrations of toxins are within the range of domestic, rather than industrial types of sewage.

A full scale 500,000 GPD Solar, Algae, Fish, Energy system for treating domestic sewage to advanced tertiary levels was selected by the County of San Diego in California as the most cost-effective alternative for wastewater reclamation, and a large-scale system for treating and converting dairy wastes into fish is under way. Wastewater is converted into clean water by utilizing solar energy to grow highly productive microalgae (phytoplankton) and fish on a nutrient-rich wastewater source. Such systems require little or no net energy input, they have no moving parts, and over seven years of intensive testing has shown to be a very stable, reliable process. Such systems offer a sound cost-benefit ratio with methane gas available for sale, hyacinth crops that may be sold for composting, soil conditioning or cattle feed, and a treated effluent of from 350,000 gallons up to 2 million gallons per day available for irrigation or recreational use in ponds and lakes. Land application could also increase the economic value of urban open-space conservation, either as recreational parks, aquaculture facilities, farms or combinations of same. It is becoming apparent that the trend is to recognize that sludge can be a resource of economic value rather than a costly and useless waste product. It becomes important to ascertain the differences between use and disposal and waste and a salable product. There is a growing market for the conversion of pollutants/wastes into highly salable products, and further, that comprehensive waste management can be a most desirable environmental, economical asset. As cheap energy disappears, natural biological systems will become increasingly valuable and this quality must be recognized in order to protect and enhance those natural systems.

A large American oil producer, operates a refinery near Casper, Wyoming where biological management has turned a wastewater pond into the state's most prolific habitat for birds and wildlife. The refinery's fresh water effluent has reduced the pond's alkali content from 20,000 parts per million to 7,000. The tremendous improvement in water quality has created an ecosystem that now supports more ducks and geese than anywhere in the state. A conservation organization, the Audubon Society, monitors the pond and catalogues a wide variety of bird species including geese, eagles, and the rare Sabine gull, not found in the area before.

Additional research is needed to determine the possibilities of combining such processes as described with the development of future park sites planned around wastewater lagoon systems to provide economic benefits to wastewater treatment operators and recreation departments now hard pressed to find available land. Numerous recreational activities including swimming and fishing could be offered, along with play areas, picnic areas, and green lawns watered and fed by treated water through reclamation processes and wise management.

Aquaculture. The heated water from power plants and industries warrants further in-depth study of the utilization of that warmed water for increasing the temperature of reservoirs, lakes and holding ponds. The addition of treated wastes from water treatment plants could provide increased nutritional materials in the form of nitrogen and other needed elements so that fish production could further reduce the plant's operational costs. It is not the intent of this author to focus on Aquaculture; however, such a venture should be encouraged in our estuaries, bays and shores. The Japanese have already proven the economic efficiencies of shifting from the harvesting of the ocean's natural production of foods to the actual "farming" of seas in a controlled environment. Additional support and enough stimulus could document the opinions of several prominent marine biologists that fishing yields could reach two or three million tons by the year 2000.

Fish farming is also tied in to marine recreation programs in several Pacific region countries and states such as Taiwan, where Tilapia and Pacu from the Amazon are transferred to recreational fishing areas. Some power plants have already created warm water lagoons, lakes and fish ponds to provide increased revenue from fish production and recreational fishing access to the general public. This same concept could be enlarged to incorporate the design to recreational parks constructed around these artificially created aquatic centers to provide boating, fishing, picnicking and sandy beaches for relaxation. Attractively designed park facilities should provide desired activities at reasonable user-fees to produce an efficient cost benefit ratio.

Wesley Marx, in "The Oceans," states that "marine development could serve to enhance, restore, and enrich the environment. Guided by this vision, oil platforms might undergo metamorphosis into high-rise marine suburbs. Below deck, fish farms might flourish, nourished by ocean sewage outfalls whose output would be as carefully blended as a puree from a food processor." (5)

Floating Hotels. Another user of marine recreation services is the petroleum and natural gas corporations involved in the off-shore drilling processes. Semi-submersible "Floatels" of 600-person capacity have been built for Chevron U.K. at a cost of approximately \$54.4 million. The self-propelled, twin hulled units were built in Sweden, and contain a medical center, theater, and recreation facilities. Europe's newest \$120 million, seven-story "Floatel" has been opened at the Norwegian Ekofisk Oil Field, 180 miles out in the cold North Sea for the Phillips Petroleum Company. The 160 ton structure has 106 rooms, cinema, chapel, dining room, coffee shop, hospital, and recreation facilities for their 1,000 workers.

Training Programs. As the off-shore rigs have continued to grow in size and with larger numbers of workers to operate the equipment on a 24-hour basis, so has the need for new recreation services. Working in relatively confined areas and extreme weather conditions tends to contribute to the human factors of stress, tension, and boredom. It has become apparent that the need is great for "on-board" recreation programs provided on the larger rigs by trained recreation personnel. The demand for specially trained personnel to handle programs on such units will require training not previously provided by the colleges and universities.

Marine Recreation courses have been developed to provide understandings in coastal zoning and access laws; use conflicts; modes of behavior involved with isolation, confinement, boredom and anxiety; the sociology of the small group syndrome; the effects of stress, work and play; specialized programs; laws and behavior in an enclosed community, and human alterations of the environment. The University of Southern California, Institute for Marine and Coastal Studies, and California State University, Northridge, Department of Recreation

and Leisure Studies, will jointly sponsor this course during the Summer 1984, at the Catalina Marine Science Center to provide professional training, laboratory work, and practical experiences in Marine Recreation.

Colonization. The question arises as to the potential need for colonizing some portions of the world's oceans to help answer the need for new sources of energy, food, and minerals. Colonization of both space and the oceans may be required for other reasons too, such as sociological, psychological and recreational needs, which sets forth interesting challenges at this point in time. Let's take a look at what some others have said, or done, or are doing, so that we do not minimize colonization of the sea, nor overlook it totally or even ignore it.

One of the most exciting additions to Disney World in Florida has been the opening of its Experimental Planned City of Tomorrow (EPCOT) Center. One of the pavilions to be opened in October 1983 is Horizons showing possible habitats of the future, one of which is an Underwater Habitat displaying buildings and possible modes of underwater transportation. Opening at a future date will be "The Living Sea" pavilion with a ride through a 5 million gallon tank filled with marine life of the coral reefs.

In an article in "The Futurist," Larry Booda wrote "sea floor living is becoming a reality with an underwater oil production system developed by a Lockheed subsidiary in Vancouver, Canada. The system consists of a steel "house" located over a sea bottom oil or gas well, at depths potentially as great as 3,000 feet, and maintained at sea level pressure. When maintenance or repair work is to be done, men are lowered from the surface to the "house" in a transfer chamber to work there in comfort at sea-level pressure." (1) This was in 1977! On a larger scale, self sustaining offshore marine communities could be developed on artificial reefs, islands, and platforms utilizing underwater habitats for the production of food, power, and the recycling of waste based upon present day technology.

The Japanese architect, Kyonori Kikutake, working with John Harmon at the University of Hawaii, has developed comprehensive plans for an entire "Floating City" that includes a land-sea use concept using land areas for housing, parks and transportation and a floating city comprised of hotels, offices, condominiums where people get around easily because moving walkways replace vehicles. Each structural unit of the city will be a half-mile in diameter and are similar to structures now used on offshore rigs in the North Sea. A model has been constructed and is afloat on a bay in Hawaii.

And on the local scene in 1983, a Southern California entrepreneur has recently announced the opening of the World's First Undersea Resort, located off the coast of Georgetown, Grand Cayman Islands in the Caribbean. Guests will reach the unit, called JULES' HABITAT, by mini-submarine. This first hotel will accommodate four people at one time. Scuba gear allows guests to explore the colorful coral reefs where they may use the underwater videotape camera to record the adventure. A "wet room" between living areas opens to the sea and allows guests to change into or out of scuba gear or use the mini-submarine. Included in the services are personal computers, video games, digital symphonic sound system, and instantaneous satellite communications around the world.

Several larger Undersea Hotels are planned for other sites around the world. Costs are targeted at \$230 a day including meals and a "merperson" is available to bring meals.

Conclusion. The past few decades have been exciting and much more lies ahead, and there will probably be some surprises as new vistas unfold. There will be more conflicting demands for coastal shoreline usage as ocean

technologies advance, thus marine recreation must demonstrate its economic benefits and potentials, as well as its social/recreational values. It is becoming increasingly important to recognize and understand the recreational value of the beaches and shore as recreational units in order to justify the cost of protecting beaches from a wide variety of competing, and sometimes adverse and impacting uses.

The questions are many:

- What is the value of time when one is on a vacation and must travel some distance to participate in a favorite activity?
- What are the factors that determine the degree to which beach congestion affects the value of a day at the beach?
- What are the major guidelines needed in the overall planning for existing shore-land areas as related to the total demands for that land-use by all potential users? How is this tied in with the protection of the resource?
- How much is a recreational experience worth? How will it be paid for and by whom?
- What data is needed on recreational fishing? Are catches consistent or varied as reported? How is the economic value measured?
- What are the components of a good experience beach day?
- Who should be responsible for getting information out to recreational users, and who pays the fees?

The list goes on, just as increasing demands on the resource use goes on. It becomes evident that one of our greatest and most urgent needs now is for an adequate, thorough research base for the development of effective guidelines for the design and operation of marine recreation facilities and programs that will provide for the wise use of the ocean and beach resources on a sustained yield basis.

The effective use of the sea requires of us all the need for cooperative efforts in the development of a coordinated multiple-use plan for resource management based upon the resolution of sometimes conflicting uses of the ocean and the shore, so that some of man's economic, social, human and recreational needs may be met.

REFERENCES

- Butlin, J.A. (1981): The Economics of Environmental and Natural Resources Policy, Westview Press, Boulder, Colorado.
- Cousteau, Jean-Michael, "News No One Tells You: The Persian Gulf," The Calypso Log, Volume 8, No. 3: 6-7.
- Edwards, R.L. and J.B. Suomala, Jr. (1981): "World Fisheries in the Twenty-first Century," Technology Review, Vol. 83, No. 4, 43-50.
- Goldberg, E.D., Ed. (1978): "Proceedings of a Workshop on Scientific Problems Relating to Ocean Pollution," Estes Park, Colorado, July 10-14.
- Holdgate, M.W. (1979): A Perspective of Environmental Pollution, Cambridge University Press, Massachusetts.
- Kaufman, Wallace, and Orin Pilkey (1979): The Beaches Are Moving, Anchor Press, Garden City, New York.
- Lippman, M. and R.B. Schlesinger (1979): Chemical Contamination in the Human Environment, Oxford University Press, New York.
- Marx, Wesley (1981): The Oceans: Our Last Resource, Sierra Club Publications, 530 Bush Street, San Francisco, California.
- Rorholm, Niels, "Marine Recreation in the Coastal Belt," Marine Technology Society Journal, Vol. 13, No. 2:26-29.
- Warner, Thomas D. and Donald F. Holecek. "The Thunder Bay Shipwreck Survey Study Report," Recreation and Planning Unit, Department of Parks and Recreation Resources, Michigan State University, 1975.

MONITORING TRENDS IN RECREATION QUALITY WITH
A RECREATION RESOURCE INVENTORY SYSTEM

Kenneth C. Chilman

Abstract.--The words "inventory" and "monitoring" are showing up more frequently in models of recreation resource decision-making. They indicate a management need for a more quantitative information base for decisions. Inventory procedures for wildland recreation have been operationalized and reported in several studies. These procedures are now being extended to recreation resource monitoring applications. Findings from monitoring studies in three locations are discussed. Emphasis is on low-cost monitoring procedures that can be applied and analyzed by field personnel. The availability of inventory and monitoring procedures will make determination of recreational carrying capacities more feasible in coming years.

Two words are beginning to show up more frequently in models for recreation resource decision-making (Washburne, 1982; Stankey et al., 1984). These words are "inventory" and "monitoring". Both indicate a need for a more quantitative information base for decision-making: "inventory" is a term used in natural resource management for measurements to indicate how much and what kinds of resources exist on a particular area, "monitoring" measurements are similar to inventory measurements but with emphasis on measurement replications at time intervals to document changes and trends that may be occurring.

Both words show up in relation to new concepts of recreational carrying capacity. An example from Washburne (1982) is shown in figure 1. Stankey et al. (1984) propose that there has been a shift in thinking from "How much use is too much?" to "What kinds of conditions are desired?", and the related question "How much change is acceptable?" If we are to consider "what kinds of conditions are desired," it is important to assess what kinds of conditions exist now for a particular recreation opportunity setting. Similarly, for "how much change is acceptable," monitoring measurements of setting conditions are needed to know what kinds of changes are occurring and how rapidly the changes are occurring.

A recreation resource inventory system has been developed and tested on a variety of wildland areas (Chilman and Hampton, 1982; Chilman, 1983). Monitoring of recreation setting conditions is of more recent concern. Stankey et al. (1983) discuss the concept and its importance for modern day recreation management, but conclude that "To date, monitoring has received more rhetoric than it has substantive discussion; consequently, the record of performance is spotty." The purpose of this paper is to discuss work that has been done on recreation inventory methods and their application for monitoring purposes on three kinds of wildland recreation areas, and findings that may be useful in future monitoring situations.

RECREATION RESOURCE INVENTORIES

To understand recreation monitoring as a system of measurements, we will examine recent work done on recreation inventories (Chilman and Hampton, 1982)

CARRYING CAPACITY ASSESSMENT

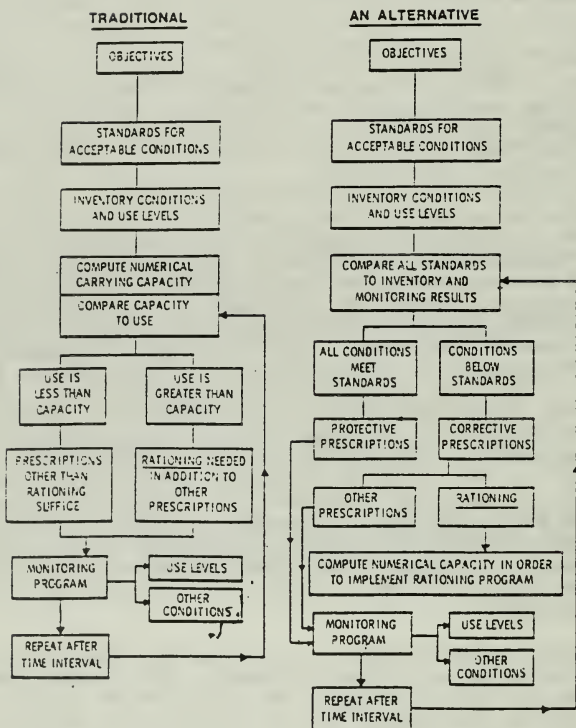


Figure 1.--Traditional and alternative approaches to assessing wilderness carrying capacity.

The underlying rationale, kinds of measurements, their integration into a system and process, cost considerations, and design of sampling for data collection are all important.

Inventories have a long tradition in other resource management disciplines: timber, wildlife, and range resources (Spurr, 1952; Avery, 1975). Recreation resources are viewed here as visit experiences to particular areas. They are renewable in the sense that they can be managed so that visitors may have a good chance of repeating desired experiences during future visits.

The underlying rationale used for the recreation resource inventory system was the management goal of providing high quality recreation experiences (Figure 2). Wagar (1966) has proposed that quality means different things to different recreation visitors; hence, a range of recreation opportunities should be provided so that individual visitors may choose a recreation opportunity closest to their desired experience on a particular trip. For the recreation manager, this means a need to know what spectrum of recreation opportunities is provided in this area and surrounding region, and how a particular recreation setting fits into the spectrum. Then when visitors choose to visit this particular setting, they may be surveyed about what the important (quality) aspects of the setting are for their desired recreation activities, and managers can work to maintain or improve these aspects.

This makes determination of recreation setting quality a two-phase process. The first phase has been made operational by the Recreation Opportunity Spectrum land classification developed by Driver and Brown (1978), and used by the U.S. Forest Service (1982). Recreation Area Division and Subdivision (RADS) is a system used to break large management units into smaller zones with special characteristics, and Travel Pattern Concentration (TPC) areas are the recreation settings where visitors choose to concentrate for particular purposes (Chilman, 1983).

The TPC becomes the focus for more detailed measurements related to describing the setting, visitor use patterns and associated site impacts, and visitors' perceptions of quality attributes of the setting and management actions needed to maintain or improve quality. Inventory measurements for recreation settings include physical, biological, and social phenomena. Physical measurements may include amounts of the setting surface that have been impacted by recreation use. Biological measurements relate to impacts on vegetation or wildlife. Social measurements include recreation visitor numbers, types, patterns of use, and perceptions of conditions.

One of the more controversial aspects of our recreation resource inventory system has been the use of a short set of questions, usually about ten questions (Chilman, 1976; Chilman Kao, 1982). This has been utilized because of cost considerations. With severe constraints on recreation budgets, data collection must often be accomplished on a part-time basis by field personnel. The question responses should be tabulated weekly and then monthly to make findings current and reduce costs of a big data analysis job after field season (Haas and Nachtman, 1979). Similar simplified methods are used for other Phase II measurements, and TPC measurements including visitor surveys have been done in a six-day period (Chilman, 1979).

RECREATION RESOURCE INVENTORY SYSTEM FOR LARGE LAND AREAS

MANAGEMENT: 1. Provide Quality Rec. Experiences
GOALS 2. Protect Rec. Experience Settings

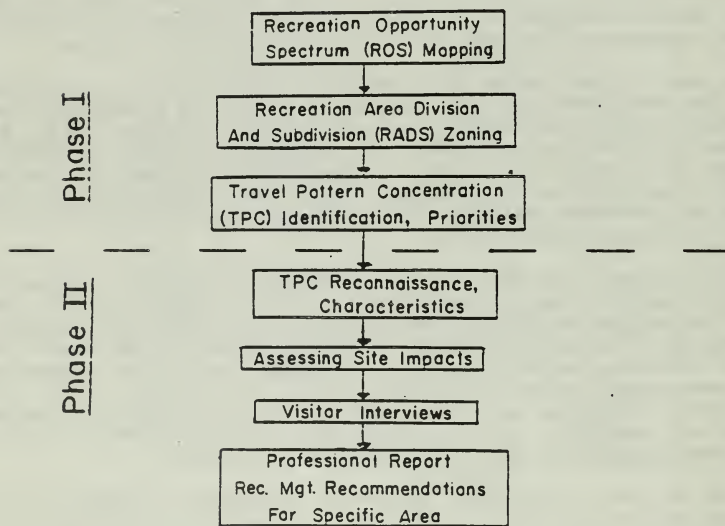


Figure 2.--Steps in the recreation resource inventory process.

Part of the efforts to reduce costs depends on asking managers and field personnel what is known about the TPC and use patterns. What are the peak periods of use, seasonally and weekly and during each day? These are usually the times of most concern to recreation managers, because user conflicts and site impacts tend to be higher at these times. Sampling can be concentrated in peak use times.

With the above consideration of some of the aspects involved in a systematic approach to inventorying conditions on a recreation setting, we will now examine work done on developing recreation monitoring systems on three areas.

MONITORING RECREATION QUALITY

Three different kinds of areas--an off-road vehicle riding area, a mountain wilderness, and a canoe float river--have been studied relative to developing monitoring of recreation use and quality. The common denominator in initiating these studies was that managers were being pressed to respond to particular issues.

Turkey Bay Off-Road Vehicle (ORV) Area

Our earliest experience with recreation monitoring began at Turkey Bay ORV Area in 1973. This 2,350-acre area is located within Land Between The Lakes (LBL), a 170,000-acre area administered by Tennessee Valley Authority in western Kentucky and Tennessee. Land Between the Lakes had been established as a national demonstration area for outdoor recreation, environmental education, and resource management (McEwen, 1978). As part of the demonstration mission, Turkey Bay was established as the first federally designated off-road vehicle recreation area.

Because concern with site impacts made the designation controversial, LBL managers established an environmental monitoring plan in 1973. This plan included measurements of impacts on soils, vegetation, and wildlife. Social measurements, except for visitor counts using traffic counter devices, were lacking. We were asked to develop a system to provide information on the ORV area user types and their perceptions of conditions.

Our immediate concern was whether trailbike riders, who constituted most of the ORV area user population and were associated with "black leather jacket" motorcyclist stereotypes, would even respond to our interviews. A series of studies showed them to be very cooperative (no interview refusals) and considerable information was obtained about the trailbike riders and their riding preferences. To gain more accurate information about amounts of ORV use, a checkpoint interview was instituted on the main access road at the traffic counter location (Chilman and Mize, 1977). Site impact measurements were made in 1973, 1975, and 1977, and showed only 50.4 acres (2.1 percent of the total area) as impacted by riding (McEwen, 1978).

Because ORV recreation did not seem to be causing drastic problems and because of commitments elsewhere, we did no further studies there until summer 1984. Then, because of rapidly increasing numbers of three-wheel, all-terrain vehicles (ATV), LBL managers became interested in using recreation inventory methods to study the effects of this change of use--especially site impacts and possible conflicts with other ORV area user types. The ATV use was found to have increased to a larger percentage (almost 50 percent of total use) than

trailbikes (Ladley and Chilman, 1985). Site impacts had remained relatively stable at 2.5 percent of the total area, a pattern similar to other site impact studies which indicate impacts increase during the first three or four years of recreational use and then level off. Conflicts among ATV and trail-bike users appeared very minimal; several rider groups used both types of vehicles during their visits.

There still remained complexities of social monitoring involved with coordinating counts, observations, patterns of use, and interviews on a very limited management budget. Using our knowledge of current setting conditions from the 1984 inventory and using concepts gained from our other monitoring studies since 1977, we designed a set of simple monitoring measurements for Turkey Bay ORV Area to be carried out by college student recreation interns at LBL. We anticipate monitoring the performance of the monitoring system in 1985 to learn what problems in implementation or analysis might arise, and how they can be handled.

Desolation Wilderness Area

We were called on in 1982 to undertake design of a monitoring plan for Desolation Wilderness, a 63,475-acre area immediately west of Lake Tahoe in California. This wilderness area has historically received heavy visitation because of its location and attractive scenery. The area is administered by the U.S. Forest Service (USFS).

A visitor permit system for Desolation Wilderness was implemented in 1978, based on wilderness travel simulation modeling studies in 1974 used to establish carrying capacity (Shechter and Lucas, 1978). In 1982, a USFS inspection report called for a monitoring program "to see whether quotas are accomplishing their purposes." Again, recreation management operating budgets were extremely limited; no additional funding could be obtained.

The best possibility to obtain monitoring information under these conditions appeared to be data collection by the three wilderness rangers during the course of their patrol duties. Part of their duties involved visitor contacts to check permit compliance and to answer question about the area. Preliminary work was done by the researcher in 1983 during a visit to the area to determine information needs, and to become familiar with the area and the rangers' work schedule and duties. In 1984, the researcher returned to Desolation for a few days with a ten question interview form that could be carried in a pocket notebook. He then spent time with each of the rangers on their working rounds, demonstrating sampling and interviewing technique.

It was determined that interviews took no longer than five minutes. If each ranger did three interviews a day on their work schedule of four ten-hour days, they would have twelve short interviews to tabulate at the end of their workweek along with their weekly written report. The weekly interviews could then be tabulated together by months. This would total 400 interviews for Desolation for the summer as an indicator of visitors' characteristics and perceptions of conditions (Chilman, 1984).

While this arrangement appeared feasible, it is uncertain whether other heavy work demands and even more limited budgets in 1985 will allow implementation. More work needs to be done to refine the wilderness management plan in

terms of objectives for each of the thirteen management units (compartments) identified in the plan. There was also variation among individual wilderness rangers, in their acceptance of the need for such measurements and analysis.

Ozark National Scenic Riverways

A third area where we have been involved in various studies relating to recreational carrying capacity for fifteen years is Ozark National Scenic Riverways (ONSR). This riverways encompasses 134 miles of the Current and Jacks Forks rivers in south central Missouri, and a corridor of land bordering the rivers. It is administered by the National Park Service (NPS).

The area was designated as the nation's first national scenic river in 1964. Concerns about rapid increases in canoe use caused a five-year research program to be initiated in 1972. Several studies of physical, biological, and social phenomena were conducted (Marnell *et al.*, 1978). Planning efforts were undertaken to limit canoe use, but court cases challenging NPS decisions took several years to resolve.

In 1984, the NPS gained control of unlicensed canoe rental operations, and affected a reduction in ONSR canoe use of approximately 25 percent. Rebidding of concession permits added to changes in the configuration of use on the ten river management zones. It was proposed that river recreational carrying capacity be based on the concept of maintaining different use densities and float conditions on various river zones, so that visitors could choose a preferred float experience setting. This strategy had been followed in establishing river carrying capacity for the Buffalo National River in Arkansas (USDI, 1982).

The NPS contracted for a study of this new configuration of river use to be done during summer 1984. The study was to seek answers to the following questions: did differences in river use densities exist on different zones? What were canoe floaters' perceptions of conditions on the individual zones? And, as a third objective of the study, a monitoring plan for measuring these aspects in future years was to be recommended.

The study design combined counts and short visitor interviews at major river accesses on eight of the ten river zones. These counts/interviews were done one weekday and one weekend day during each two-week period. Four of the accesses required two researchers because of multiple canoe landings. Two research technicians and one volunteer-in-parks assistant were used to collect data. The research technicians used one day each week to enter field data on the ONSR headquarters computer and to prepare summary tables. The summaries and other observations were discussed with ONSR staff.

A range of use densities was found to exist on various river zones (Chilman and Everson, 1985). Perceptions of crowding were found to be lower than earlier studies in 1979. It was recommended that information about the different river zones and use densities be made available to river visitors to aid in their selection of desired float trip conditions. Monitoring of river use in future years will use the same study design, but with one research technician and an assistant sampling only half as many days as during summer 1984. Monitoring will focus on whether desired zone conditions are being achieved and maintained, and to watch for unforeseen changes in use patterns.

DISCUSSION

Monitoring systems for recreation management purposes are beginning to show up in models of decision-making, and in field applications. The three examples of recreation monitoring situations examined above indicate that there are low-cost measurements being initiated for physical, biological, and social phenomena. Resource inventory concepts that have been used in other natural resource management specializations for years are useful for structuring these measurements into a system of measurements. This approach makes the monitoring system readily understandable for application and analysis by field level personnel. It also makes the monitoring measurements easier to replicate.

Methods for monitoring physical and biological aspects of wildland recreation areas have been known for some time. Monitoring measurements for social phenomena are of more recent origin. Several kinds of information are needed--counts of visitors, observations of types of visitors and patterns of use (where, when, how much), and visitor surveys. Considerable social research has been done with long, detailed questionnaires: much less attention has been given to developing short sets of questions for field use. Because of management budget constraints, we have worked on developing systems with which individuals can gather field data of various types in combination. We have also worked to develop analyses of these social data in combination with physical/biological data for particular recreation settings.

Although budgets are important constraints on data collection, our experience in the above monitoring situations is that resources, i.e., personnel, can be found to do data collection if the need is strong enough. These turned out to be different kinds of field personnel in each of the three situations--wilderness rangers, research technicians, volunteers-in-parks, summer interns. An important element for gaining reliable data is training of these individuals, and periodic checking of fieldwork and analyses procedures.

In fact, one of the more important things we learned is the need for weekly data summarization and discussion of results and observations with park managers or staff. This gives early attention to changes occurring or new insights, keeps data processing from being a large and boring job at the end of the season, and keeps data collection personnel more involved and alert. This ongoing summarization and analysis will be especially important when monitoring recreation quality becomes understood and used as a regular part of the management system, rather than for dealing with immediate crisis questions.

Finally, two trends appear to be emerging. Monitoring systems are beginning to be developed as a tool for recreation management. But beyond that, the structured measurements for inventory and monitoring purposes are making operational the complex business of determining recreational carrying capacities for wildland areas. The carrying capacity/management objective-setting systems are complex, but if methods become clear and carefully applied, much more professional management should result.

REFERENCES CITED

- Avery, T. E. 1975. Natural resources measurements. 2nd ed. 339 p. N.Y.: McGraw-Hill.
- Chilman, K. C. 1976. Reading the visitor mind. In Managing recreation resources for Century III: Proc. John Wright Forestry Conference, p. 50-59. West Lafayette, Indiana: Department of Forestry, Purdue University.
- Chilman, K. C. 1979. The dispersed recreation use situation and recommendations for management, Marlette Beaches area, east shore of Lake Tahoe, California. 7 p. Research report: Department of Forestry, Southern Illinois University at Carbondale.
- Chilman, K. C. 1983. Developing an information gathering system for large land areas. In S. L. Lieber and D. E. Fesenmaier (eds.) Recreation planning and management, p. 203-215. State College, Pa.: Venture Publishing.
- Chilman, K. C. 1984. Design and testing of a visitor monitoring system for Desolation Wilderness, California. 8 p. Research report: Department of Forestry, Southern Illinois University at Carbondale.
- Chilman, K. C., and D. Mize. 1977. A systematic sampling of visitors to Turkey Bay Off-Road Vehicle Area. 24 p. Research report: Department of Forestry, Southern Illinois University at Carbondale.
- Chilman, K. C., and G. Hampton. 1982. A new recreation inventory system to aid land management decision-making. In Forest and river recreation: research update. Misc. Public. 18-1982, p. 42-44. Univ. of Minn. Agricultural Exper. Stn., St. Paul, Minn.
- Chilman, K. C., and J. Kao. 1982. Quality of outdoor recreation: A short set of questions used for field level resource management. 3 p. Research report: Department of Forestry, Southern Illinois University at Carbondale.
- Chilman, K. C., and A. Everson. 1985. A system to identify and monitor recreation use patterns at Ozark National Scenic Riverways. 30 p. Research report: Southern Illinois University at Carbondale.
- Chilman, K. C., D. Foster, and A. Everson. 1985. Monitoring river use: Combining canoe counts and visitor surveys. 10 p. (In press.) Proceedings of National River Recreation Symposium, Louisiana State University, Baton Rouge, LA, October 31-November 3, 1984.
- Driver, B. L., and P. J. Brown. 1978. The opportunity spectrum concept and behavioral information in outdoor recreation resource supply inventories: A rationale. In Proc. of integrated renewable resources inventories workshop. USDA For. Serv. Gen. Tech. Report RM-55, p. 24-31. Rocky Mtn. Forest Exper. Stn., Fort Collins, Colorado.

- Haas, G. E., and S. C. Nachtman. 1979. A more efficient and effective utilization of a Forest Service seasonal employee. 55 p. Research report: Department of Recreation Resources, Colorado State University, Fort Collins, Colorado.
- Ladley, J., and K. C. Chilman. 1984. Recreation resource inventory: Turkey Bay Off-Road Vehicle Area, Land Between the Lakes, Kentucky. 37 p. Research report: Department of Forestry, Southern Illinois University at Carbondale.
- Marnell, L., D. Foster, and K. C. Chilman. 1978. River recreation research at Ozark National Scenic Riverways 1970-1977. 139 p. National Park Service, Van Buren, Missouri.
- McEwen, D. N. 1978. Turkey Bay Off-Road Vehicle Area at Land Between The Lakes: An example of new opportunities for managers and riders. 28 p. Research Report Number 1, Department of Recreation, Southern Illinois University at Carbondale.
- Shechter, M., and R. C. Lucas. 1978. Simulation of recreational use for park and wilderness management. 220 p. Baltimore: Johns Hopkins University Press.
- Spurr, S. H. 1952. Forest inventory. 476 p. N.Y.: Ronald Press.
- Stankey, G. H., P. J. Brown, and R. N. Clark. 1983. Monitoring and evaluating changes and trends in recreation opportunity supply. In Renewable resource inventories for monitoring changes and trends, p. 227-230. Proc. of International Conference, College of Forestry, Oregon State University, Corvallis, Oregon.
- Stankey, G. H., S. F. McCool, and G. L. Stokes. 1984. Limits of acceptable change: A new framework for managing the Bob Marshall Wilderness complex. p. 33-37. Western Wildlands, Fall 1984.
- U.S. Department of Agriculture, Forest Service. 1982. ROS user's guide. 32 p. USDA Forest Service: Washington, D.C.
- U.S. Department of the Interior, National Park Service. 1982. Buffalo National River use management plan. 47 p. National Park Service, Harrison, Arkansas.
- Wagar, J. A. 1966. Quality in outdoor recreation. Trends in Parks and Recreation 3(1966):9-12.
- Washburne, J. F. 1982. Wilderness recreational carrying capacity: Are numbers necessary? Jour. Forestry 80(11): 726-728.

PREDICTING AND UNDERSTANDING OUTDOOR RECREATION TRENDS
THROUGH THE USE OF GEOGRAPHIC INFORMATION SYSTEMS

William H. Becker and Timothy J. Kelly

Abstract. -- A geographic information system is used to assess the underlying cultural and natural resource factors that account for current and projected patterns of outdoor recreation participation. Based on participation patterns, resource values in Minnesota are found to be highly concentrated. Lake regions are primary recreation magnets. Changes in water surface use between 1980 and 1995 will concentrate, as expected, primarily in areas of high resource value. The principal attributes of lakeshore likely to support development in the major use areas are found to be access to roads and urban centers along with preferred mixes of soil (beach) types and lake types. These same natural resource and locational selections, inferred from development patterns, were as evident in 1967 as 1982. The indication was that these traditional selections would remain in effect for at least the near future.

Additional Keywords: Resource valuation, geographic information systems, shoreland development .

Traditional forecasts of recreation trends concentrate on the expected quantity of change in participation. Usually the forecasts predict change for a particular population, such as a state, or a particular site such as a park or forest. Forecasting changes in use for wide areas is normally limited to geopolitical or administrative subdivisions like counties or development regions. Unfortunately, such subdivisions often split areas of use, thus hiding valuable information for decision-making. The advances in geographic information system technology, coupled with complementary recreation survey research, overcome the shortcomings of the usual analyses. These advances allow better prediction of the location of changes in recreation participation. This paper demonstrates the use of these techniques to:

- 1) Locate the high-value recreation/tourism areas of Minnesota.
- 2) Describe the expected magnitude and distribution of change in lake-related activities.
- 3) Locate and describe the characteristics of lakeshore parcels that are likely to support the changes in lake surface use.

MINNESOTA'S HIGH VALUE TOURISM AREAS

Evaluating the importance of areas to recreators and thereby the tourism economy is an important first step in efficient recreation resource management. An excellent discussion of the methods for evaluating sites for recreation was prepared by Yargas et al. (1982) for Resources for the Future. Yargas identified and discussed six methods for evaluating resources, including travel cost. Travel cost was found to be an appropriate method when trips are to single, uncongested sites with insignificant nonuser benefits and significant variation in time invested across recreators. Yargas noted that multi-equation models have to simultaneously estimate demand for a number of sites (Chicchetti 1976). However, Yargas did not document any use of travel cost for large areas. Such an approach is possible and is the first step in predicting which places within broad areas are likely to support increased recreation participation.

In 1978, Minnesota invested in a detailed study of summer nonresident motor vehicle travel. The study yielded over 4000 travel diaries containing information on in-travel expenditures, origin of travelers, recreation activities, length of time in each activity occasion and location of recreation occasions, which were geocoded to public land survey townships. These data are ideal for applying the travel cost approach to wide areas, such as an entire state, using a geographic information system. Minnesota possesses a geographic information system (Minnesota Land Management Information System) with grid-cell analysis software. It is housed at the State's Land Management Information Center. By combining these resources with additional origin-destination data for resident recreation, a statewide analysis of the value of natural resources to the recreation/tourism industry can be performed.

A discussion of the method applied here can be found in "The Geographic Distribution of Travel Related Costs for Outdoor Recreation in Minnesota" (Kelly and Becker, 1985). Briefly, in that paper travel costs for nonresidents were apportioned to recreation occasions based on the portion of total recreation time spent in each occasion. Because there were no survey data on resident expenditures, nonresident figures were used as the maximum value of a resident activity occasion when residents traveled over 100 miles by road from home to recreate. It was assumed that resident and nonresident activity expenditures would be largely the same when both types of recreators were Minnesota tourists. From these maximum 'tourist' expenditure values at 100 miles from home, resident spending was decreased linearly with travel distance to minimum values at zero distance from home. Minimum values were no lower than \$2.50 per activity occasion, which is the approximate expenditure for an occasion within five miles of home reported in the Minnesota volume of the 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Minimum expenditures were increased if gas or fees were required to participate in the activity (for example, gas for power boating or snowmobiling, and fees for camping). Resident travel distances between county of origin and township of destination were calculated with the aid of the geographic information system.

Over 100,000 sample recreation occasions were expanded and plotted on the state grid. Occasion plots were generalized for strategic-level

decision-making through a "smoothing routine", which averaged participation amounts from adjacent townships. The result is found in Figure 1. Examining that figure shows that the primary, high-value recreation region outside the Minneapolis-St. Paul metropolitan area lies in the center of the state. It can be seen as an elongated, darkly shaded area on a northwest to southeast lie. Smaller, nonpopulation oriented concentrations of high value can be found to the southwest of that major region, in the Boundary Waters Canoe Area Wilderness, and to the northwest and southwest of the Minneapolis-St. Paul metropolitan area.

EXPECTED MAGNITUDE AND DISTRIBUTION OF RECREATION ACTIVITY CHANGES

Having located the high-value recreation/tourism areas of Minnesota, we can turn to a closer examination of the expected change in recreation activity. Because Minnesota recreation is predominately water related, it stands to reason that efforts viewing change should concentrate on water. As can be seen in Figure 2, summer fishing and boating by residents are popular activities that will rapidly increase over the next fifteen years. The forecasted increase in fishing is approximately equal to the predicted rise in population. Population and fishing increase at the same pace because of the uniformity in fishing participation rates across age classes (Figure 3). A similar pattern in participation rates across age classes was found for boating. In contrast, swimming is an activity that has a participation rate peak in the younger age brackets, which are not expected to increase as fast as the overall population. Thus, the increase for swimming between 1980 and 1995 is considerably below that of fishing (Minnesota Department of Natural Resources, 1985).

Using the geographic information system and the knowledge of origins, destinations, age and sex of recreators, and county population growth estimates, we can model the location of increases in activity between 1980 and 1995. Figure 4 shows where we expect fishing pressure to increase. Figure 5 shows where more boating pressure is likely to occur. These maps assume that the current distribution of facilities attracting use remains constant and accommodates changing population patterns. They indicate that the majority of the new boating and fishing will occur in the high-value recreation/tourism areas. That is, in Minnesota the resources of the high-value areas are the predominant determinates of where people will boat and fish.

The location of expected changes in participation in another water activity exhibits less resource dominance. Figure 6 shows the location of expected increases in swimming between 1980 and 1995. While resource exercises some influence, population growth, especially in the younger age brackets, also drives increases in swimming. This can best be seen by looking at the forecasted growth around the Minneapolis-St. Paul metropolitan area, where rapid suburban growth and family formation are expected.

IDENTIFYING LIKELY LOCALIZED AREAS THAT WILL SUPPORT INCREASES IN USE

As noted above, Minnesota has a high dependence on lake resources for outdoor recreation, especially away-from-home recreation. Not all of the state's lake resources, however, are equally desirable as recreation settings. Some are remote from population centers, others are inaccessible by primary or secondary roads, and still others have beach, vegetation and lake characteristics that are not preferred by the recreating public. The interplay of natural resources with cultural features produces a pattern of shoreline recreation development opportunities that often vary over short distances along the shore. In other words, the probable development opportunities vary at a detailed spatial scale, a scale much finer than those broadly delineated on preceding maps. Lakeshore residences, both vacation cottages and year-round homes, exhibit such a detailed scale of development opportunities. And they are effective surrogates for recreation development opportunities that are defined by both the natural resource base of the setting and the location of that setting in relation to people and transportation.

Minnesota has conducted two censuses of large lakes (greater than 145 acres in size) that are located outside the Twin Cities metropolitan area and that have residential development potential. The first census occurred in 1967 (Borchert et al., 1970) and the other in 1982 (Cohen and Stinchfield, 1984). For each census, data were collected for approximately 40,000 lake lots (the typical lake lot is the terrestrial portion of a 40-acre parcel and contains about 1500 feet of lake frontage). Information collected for a lake lot included a public-land-survey geocode, number of seasonal and permanent residential structures, and a variety of natural resource characteristics: soil (beach) type, vegetative cover and natural lake ecology. The lake-lot geocode permitted additional data from the geographic information system to be attached to each lot. Lot ownership and the relative location of the lot with respect to major urban service centers and roads were among the data items attached to a lot record.

Table 1 displays the influence of location relative to major urban service centers and the road network on lake-lot development. Total housing unit development per mile of private shoreline is highest on lots near cities and near the best roads. Year-round (permanent) development, as compared with vacation (seasonal) development, has more restrictive location requirements. It is highly skewed toward cities and better roads. Although Table 1 is for 1982, the same pattern of development densities across these two accessibility factors was found in 1967. Development totals were simply larger in 1982. That is, growth took place on the same lake-lot accessibility classes after 1967 as before 1967.

Putting relative location aside, certain natural resource combinations attract the most intense development (Table 2). Of greatest development intensity is the much-touted forested lot with sandy soils that fronts on a walleye lake. Treeless lots with finer texture soils that front on more eutrophic lakes have considerably less development. These natural resource preferences were largely the same in 1967 and 1982, and there is no indication that these traditional preferences are changing.

The combination of natural resource and relative location factors illustrates how shoreland development is guided by influences that can both complement and offset each other. It provides a useful perspective on development factors by permitting one factor to vary while others are held constant. In order to view all five development factors together, while at the same time losing little discrimination ability for any factor, lake types were collapsed into 3 classes, soils into 3 classes, vegetative cover to 2 classes, access to roads to 4 classes, and access to urban service centers to 2 classes. Even after this reduction in class numbers, 144 possible combinations of the five development factors remain, all of which contain lake lots. Of these 144 combinations of the five development factors, 12 are presented as examples in Table 3. Only forested lots, lots with sandy soils and lots beyond five miles from an urban service center are included in the table. It is evident in Table 3 that lake lot development densities decrease as lake types become more eutrophic and as lots become more distant from roads. However, offsetting influences are also evident. For example, lots on roughfish lakes, with excellent road access, have development densities that exceed those on the more preferred walleye lakes that have poor road access.

Development potential classes, based on 1982 housing unit densities of 20, 10 and 5 as class breaks, are displayed on Table 3. Development potential class 1, with the highest densities, describes natural resource and relative location factors that will help maintain high development densities on lots already developed. Maintenance of dense development is expected to be partly accomplished through redevelopment of existing structures. These same resource and location factors give a strong indication that more development is likely on lots with little or no development. At present, many of the lots in development potential class 1 are only lightly developed. Forty percent of the privately owned frontage has less than 10 housing units per mile of shoreline and thirty percent of private frontage has less than 5 housing units per shoremile. The identification of such lots should help resource managers anticipate the location of new development and to plan accordingly. Few of the lots in development potential class 4 are currently developed, and little of scarce management time should be allocated to planning for their development. Nine-tenths of private frontage in this development class has less than 5 housing units per shoremile. Development classes can also be applied to entire lakes, the usual planning unit. Lakes can then be evaluated according to their mix of lake-lot development classes. This should provide one source of information on the future course of total lake development.

Table 3 has 11 companion tables, which complete the description of natural resource and relative location influences on housing unit development densities, and the definitions of the four development potential classes in terms of those influences. The 11 companion tables are not reproduced here, but can be viewed through Table 3 in the following ways: if the sandy soil specification of Table 3 is replaced by loamy or wet (clayey) soils, the lower development potential classes expand upward and to the left to cover more cells in the table; similarly, if unforested lots are specified, the lower development potential classes expand; on the other hand, specifying lots within 5

miles of major urban service center, expands the higher development classes to cover more cells in the table.

Examining the distribution of development potential classes in the high-tourism north-central lakes region reveals that: (i) lake lots with the highest development potential are rare, comprising 1 percent of the total area of the region; (ii) development potential classes can change rapidly over short distances along a shoreline, mostly due to soil and road access variations; and (iii) lakes are composed of a mixture of lake-lots development potential classes, and a few lakes are a composite of all four classes (see Figure 7 for the distribution of development potential classes in a portion of the north-central lakes region). Overall, maps such as Figure 7 are effective in portraying, at a detailed spatial scale, the regional distribution of development opportunities for lakeshore homes and for recreational facilities that require ready access over the road network to high quality lake settings. And with only minor modification in the way natural resource and relative location factors are combined, high quality lake resources that are inaccessible to people -- another type of appealing outdoor recreation setting -- can be easily delineated.

CONCLUSION

A geographic information system, based on grid cells, was utilized to assess the underlying cultural and natural resource factors that account for current and projected patterns of outdoor recreation participation. Applications were illustrated for wide areas (state of Minnesota) and for lakeshore lots (about 40 acres in size). For Minnesota as a whole, the use of grid cells (approximately 36 square miles in size) to locate activity participation data was effective in portraying the reasons for participation distributions. It overcame the frequently encountered problem inherent in the interpretation of participation patterns located by geopolitical or administration divisions, which are rarely delineated according to factors important in understanding recreation use distributions. At a much finer spatial scale, the geographic information system permitted an assessment of how lakeshore recreation development opportunities vary over short distances and depend on the interplay of natural resources with the relative locations of cultural features.

When coupled with recreation survey research, the geographic information system is a powerful analytic tool. Survey data and the information system were used to locate the high-value recreation/tourism areas of Minnesota, which are primarily the lake regions; to describe the expected magnitude and distribution of increases in lake-related activities; and to locate and describe the natural resources and relative location characteristics of lakeshore parcels that are likely to support the changes in lake surface recreation.

LITERATURE CITED

- Borchert, J.R., G.W. Orning, J. Stinchfield, and L. Maki. 1970. Minnesota's Lakeshore: Resources, Development, Policy Needs. Department of Geography and the Center for Urban and Regional Affairs, University of Minnesota, Minneapolis, Mn.
- Chicchetti, C., A. Fisher and V. Smith. 1976. An Econometric Evaluation of a Generalized Consumer Surplus Measure: The Mineral King Controversy. Econometrica 44: 7259-7276.
- Cohen, P., and J. Stinchfield. 1984. Shoreland Development Trends. Minnesota Department of Natural Resources, St. Paul, Mn.
- Kelly, T. and W. Becker. 1985. The Geographic Distribution of Travel Related Costs for Outdoor Recreation in Minnesota. Internal Agency Report. Minnesota Department of Natural Resources, St. Paul, Mn.
- Minnesota Department of Natural Resources. 1983. DNR-Administered Public Lands: Their Suitability to meet Resource Management Objectives. Minnesota Department of Natural Resources, St. Paul, Mn.
- Minnesota Department of Natural Resources. 1985. Minnesota State Comprehensive Outdoor Recreation Plan. Minnesota Department of Natural Resources, St. Paul, Mn.
- U.S. Department of Interior, Fish and Wildlife Service; and U.S. Department of Commerce, Bureau of the Census. 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation: Minnesota.
- Yardas, D., A. Knipnick, H. Peskin, and W. Harrington. 1982. Directory of Environmental Asset Bases and Valuation Studies. Resources for The Future, Washington, D.C.

:ln
whb70/WHB1

SERVICE CENTER AND ROAD ACCESS: DEVELOPMENT DENSITY ON
LAKES GREATER THAN 145 ACRES, 1982

MAJOR SERVICE CENTER ACCESS	ROAD ACCESS CLASS					TOTAL
	high 1	2	3	4	low 5	
1	28.4	14.4	10.7	4.0	2.6	16.6
(within)	16.2	4.7	6.5	1.9	1.3	9.4
(5 mi)	12.3	9.8	4.2	2.1	1.3	7.2
	207	27	258	53	15	560
2	18.9	11.8	6.5	3.0	1.0	10.6
(6-15 mi)	8.4	3.6	2.7	.9	.1	4.3
	10.6	8.1	3.8	2.1	1.0	6.2
	877	396	1195	323	61	2852
3	19.0	12.9	8.1	4.5	2.0	10.4
(16-30 mi)	6.6	3.1	2.5	.8	.1	3.1
	12.4	9.8	5.6	3.7	1.9	7.3
	874	524	1161	602	321	3482
4	20.8	13.4	7.8	4.1	1.1	8.7
(>30 mi)	5.7	2.5	1.6	.5	.1	1.9
	15.1	10.8	6.1	3.5	1.0	6.8
	231	206	345	258	303	1343
TOTAL	20.1	12.6	7.6	4.0	1.6	10.6
	8.1	3.2	2.8	.8	.1	3.8
	11.9	9.4	4.8	3.2	1.4	6.8
	2189	1153	2959	1236	700	8237

KEY

(units/private shoremi.)

← Total

← Permanent

← Seasonal

← Shoremiles

LEGEND: ROAD ACCESS CLASS DESCRIPTION

PAVED ROAD ACCESS	GRAVEL ROAD ACCESS			
	Adjacent	>0 and ≤ 1/2 mile	>1/2 and ≤ 1 mile	>1 mile
Adjacent	1	1	1	1
>0 and ≤ 1/2 mi	1	3	3	3
>1/2 mi ≤ 1 mi	2	3	4	4
>1 mi	2	4	5	5

SOURCE: Cohen and Stinchfield, 1984.

TABLE 2

Total housing unit/mile of private shoreline, 1982

(excludes Otter Tail County)

-----TABLE KEY-----
 1.2 - total housing units per mile
 of private shoreline
 17 - (miles of private shore)

L A K E T Y P E

Shore/Physical Combination (Trees/Soils)	Roughfish Gamefish Bullheads	Game	Trout	Walleye (hard & soft water)	Centrarchid Walleye	Centrarchid Resource	Special Resource	Row* Marginals
Coniferous	wet 1.2 (17)	0 (1)	0 (.5)	15.3 (10)	5.5 (15)	3.2 (12)	.8 (5)	5.0 (61)
	loam 8.6 (18)	3.0 (2)	3.9 (4)	11.4 (13)	8.7 (33)	4.6 (26)	2.8 (5)	7.3 (102)
	sand 5.0 (14)		1.7 (1)	23.7 (56)	15.6 (59)	18.0 (55)	9.1 (2)	17.8 (187)
	bedrock 10.4 (.5)		0 (1)	1.0 (17)	1.0 (3)		0 (1)	.9 (22)
Deciduous	wet 3.9 (383)	.7 (54)	10.3 (1)	18.7 (99)	13.3 (182)	10.5 (173)	4.1 (9)	8.5 (901)
	loam 4.7 (508)	1.2 (49)	1.0 (4)	14.5 (185)	14.2 (348)	9.1 (365)	2.9 (18)	9.1 (1478)
	sand 8.9 (187)	3.6 (10)	2.4 (3)	24.1 (210)	22.5 (377)	19.0 (345)	12.7 (7)	19.2 (1138)
	bedrock 9.7 (5)		1.9 (1)	.4 (44)	10.0 (12)	0 (.5)	0 (3)	2.8 (64)
No trees	wet 1.8 (466)	.9 (73)	0 (1)	5.2 (124)	6.3 (186)	6.0 (180)	1.6 (15)	3.7 (1045)
	loam 2.1 (152)	.6 (16)		7.3 (16)	8.8 (97)	5.3 (56)	.3 (6)	4.7 (343)
	sand 5.6 (80)	1.8 (5)		12.1 (62)	13.5 (80)	10.3 (40)	0 (1)	9.8 (285)
	bedrock 1.0 (5)			6.7 (4)	.6 (2)	4.0 (14)		3.6 (24)
Column* Marginals	4.1 (1835)	1.1 (211)	2.8 (15)	15.2 (839)	14.6 (1371)	11.6 (1307)	3.3 (71)	9.9* (5651)

* - each figure rounded off independently, so marginals will not always add up.

SOURCE: Minnesota Department of Natural Resources, 1983.

TABLE 3

DEVELOPMENT POTENTIAL CLASS FOR LAKE LOTS
 (i) OVER 5 MILES FROM A MAJOR URBAN SERVICE CENTER,
 (ii) WITH FOREST COVER AND (iii) WITH SANDY SOILS

Note: Table values are averages of total housing units per mile of private shoreline, 1982.

Development Potential Class (DPC): DPC I - Highest
 DPC II
 DPC III
 DPC IV - Lowest

-----Lake Class-----				
Road Access Class ^a	Trout/Walleye ^b	Centrarchid	Roughfish ^c	Row Marginal
1	31 DPC I	29	DPC II 15	28
2	21 DPC II	20	DPC III 8	20
3	18 DPC III	16	DPC IV 7	15
4 & 5	6	6	2	5
Column Marginal	22	20	9	19

^a See Table 1 for definitions of road access classes

^b Includes hard- and soft-water walleye, centrarchid walleye and special resource lakes

^c Includes game lakes

FIGURE 1 TOTAL TRAVEL-RELATED EXPENDITURES FOR OUTDOOR RECREATION

Expenditures are plotted where
the recreation activity occurs

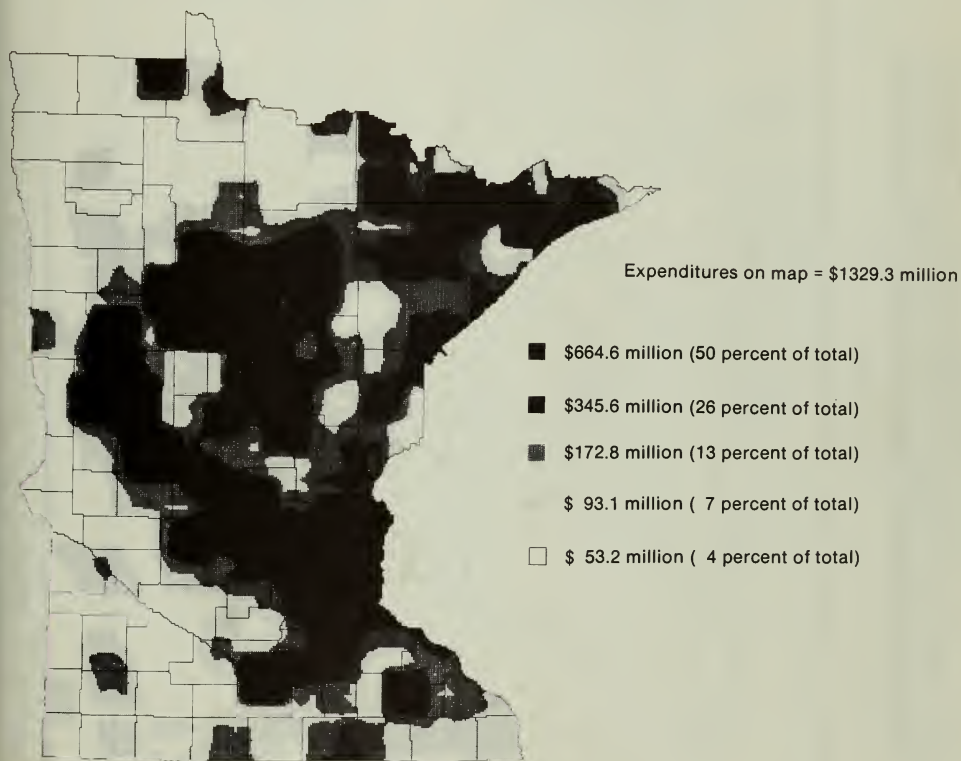
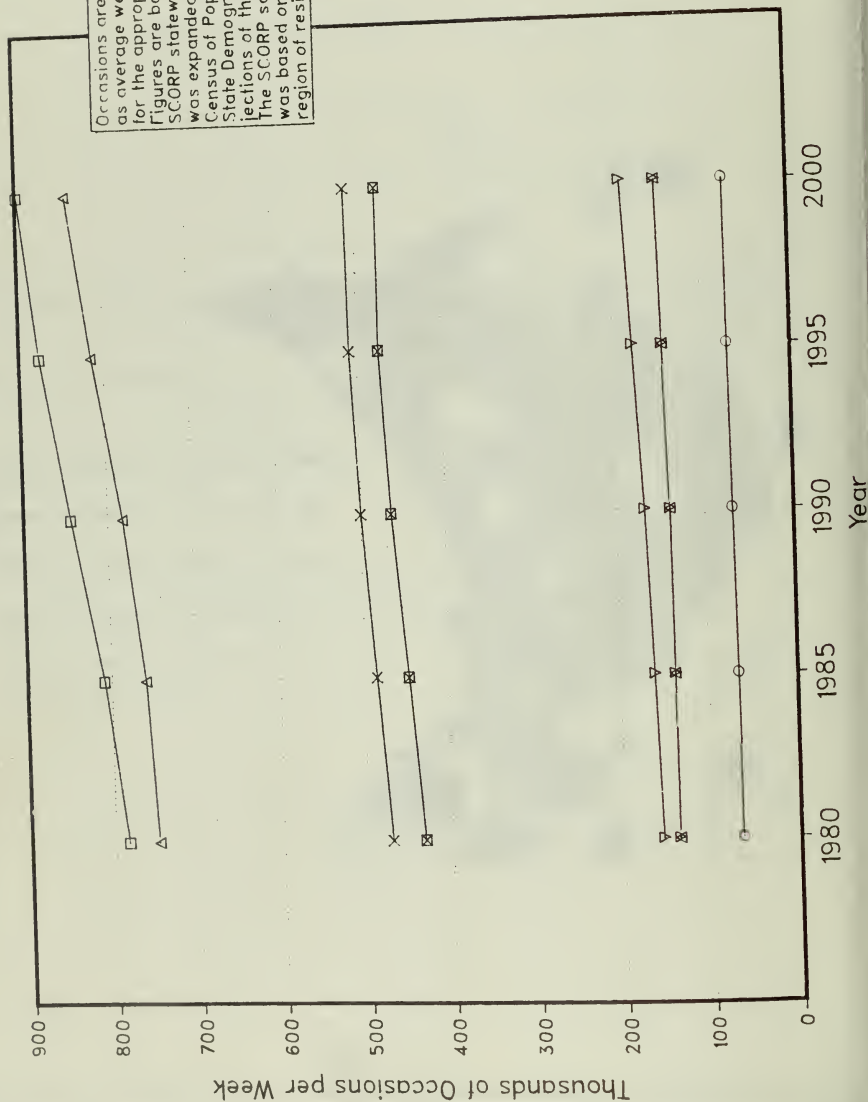


FIGURE 2
Minnesota Outdoor Recreation Survey
Projected Instate Recreation by Residents
Summer



Minnesota Outdoor Recreation Survey Sex/Age Activity Participation Rates by Residents who Recreate Instate

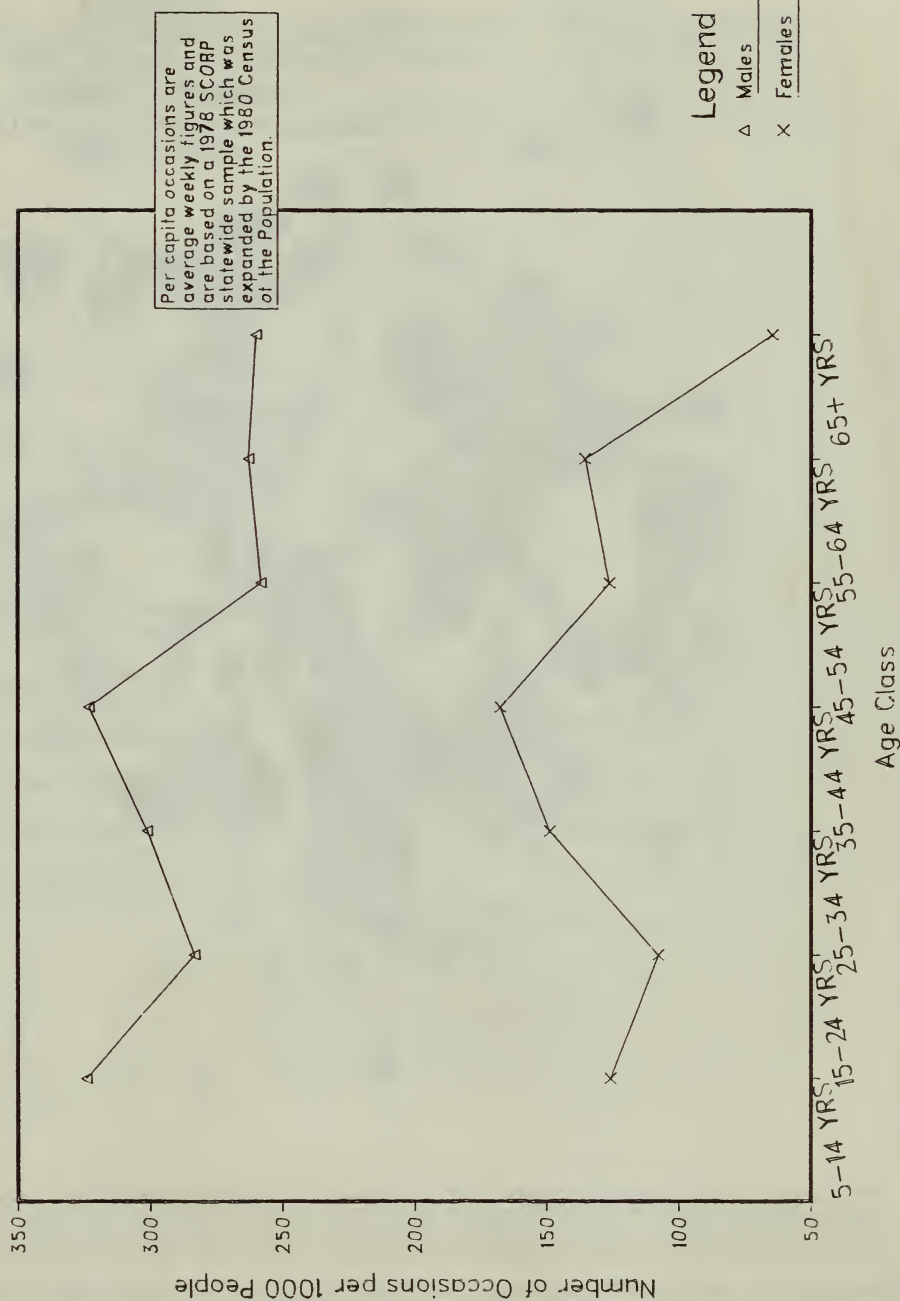
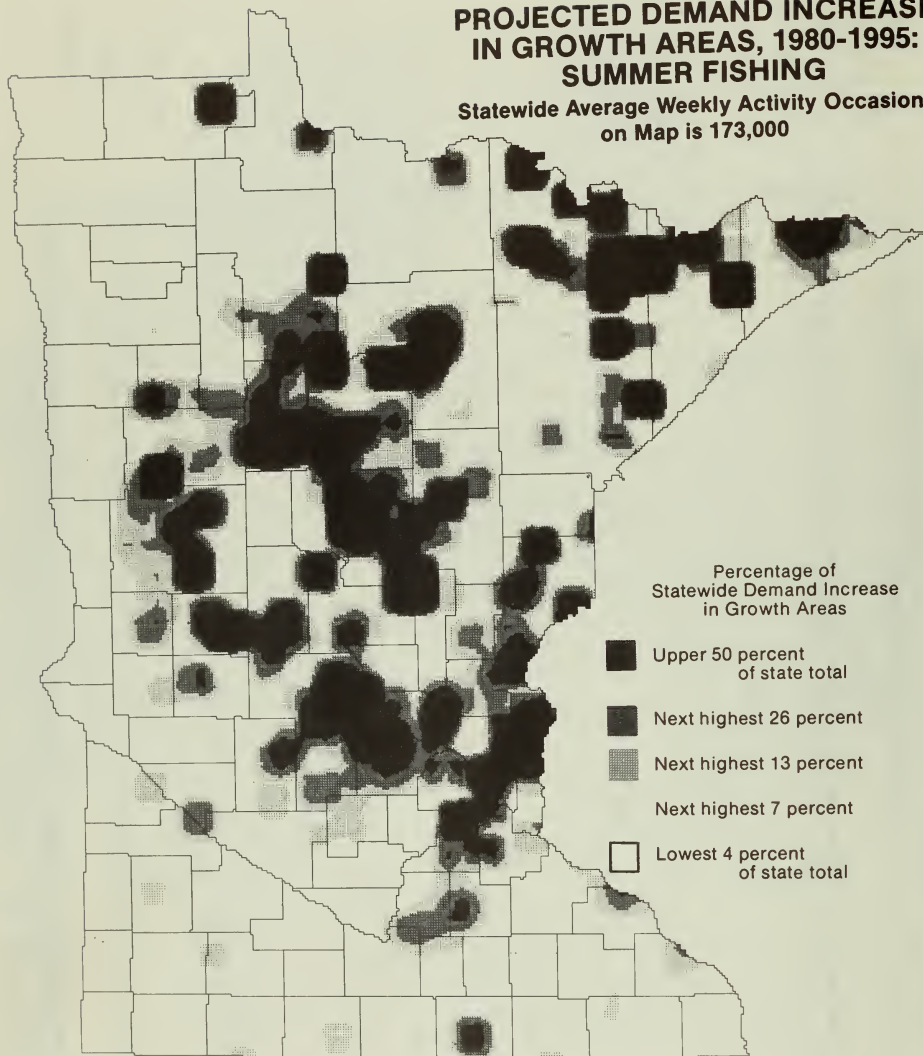


FIGURE 4 PROJECTED DEMAND INCREASE IN GROWTH AREAS, 1980-1995: SUMMER FISHING

Statewide Average Weekly Activity Occasions
on Map is 173,000



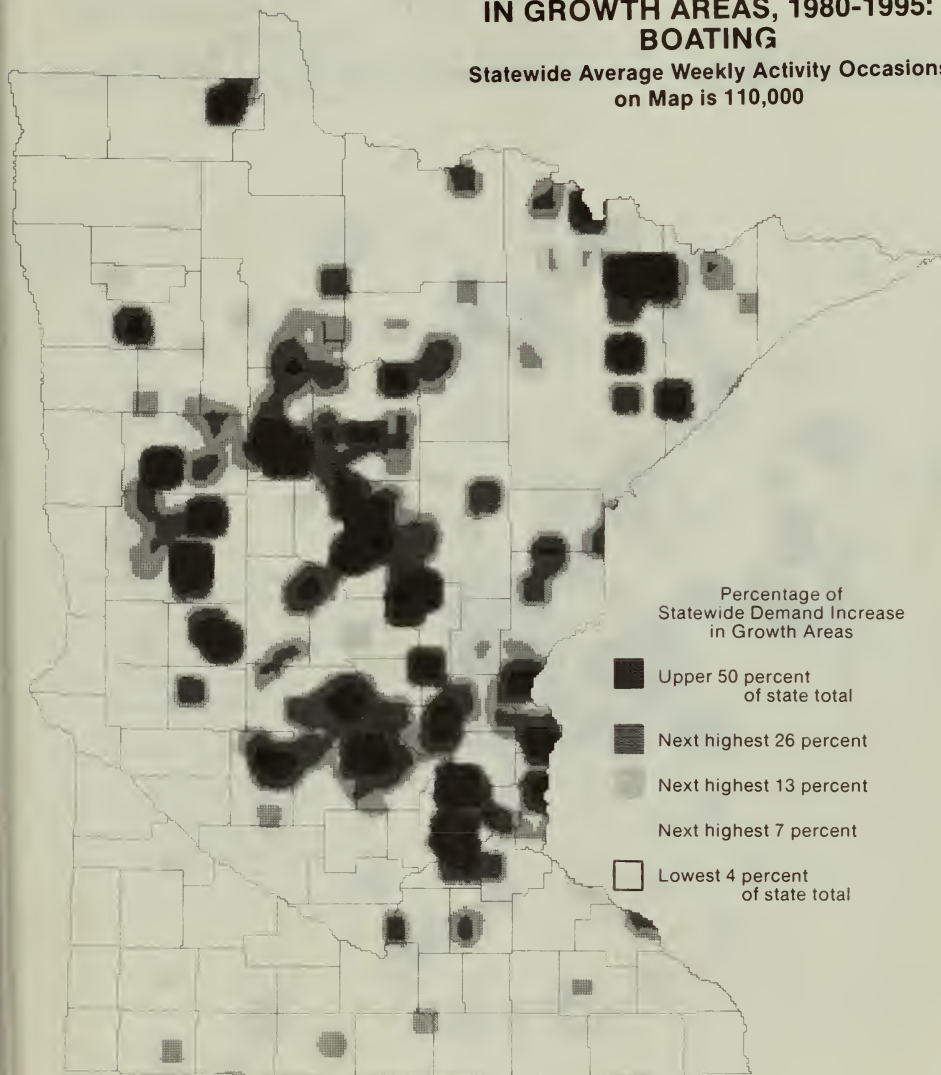
NOTE: Activity figures are based on 1978 SCORP statewide summer samples of residents and nonresidents, or a winter sample of residents. The resident samples were expanded by the 1980 Census of Population and the State Demographer's projections of the 1980 Census. The sample expansion was based on age, sex, and region of residence. The projection of the nonresident sample was based on a surrogate group of touring residents.

SOURCE: Minnesota Department of Natural Resources, State Comprehensive Outdoor Recreation Plan, 1985.

0 20 40 miles
0 20 40 60 kilometers

FIGURE 5 PROJECTED DEMAND INCREASE IN GROWTH AREAS, 1980-1995: BOATING

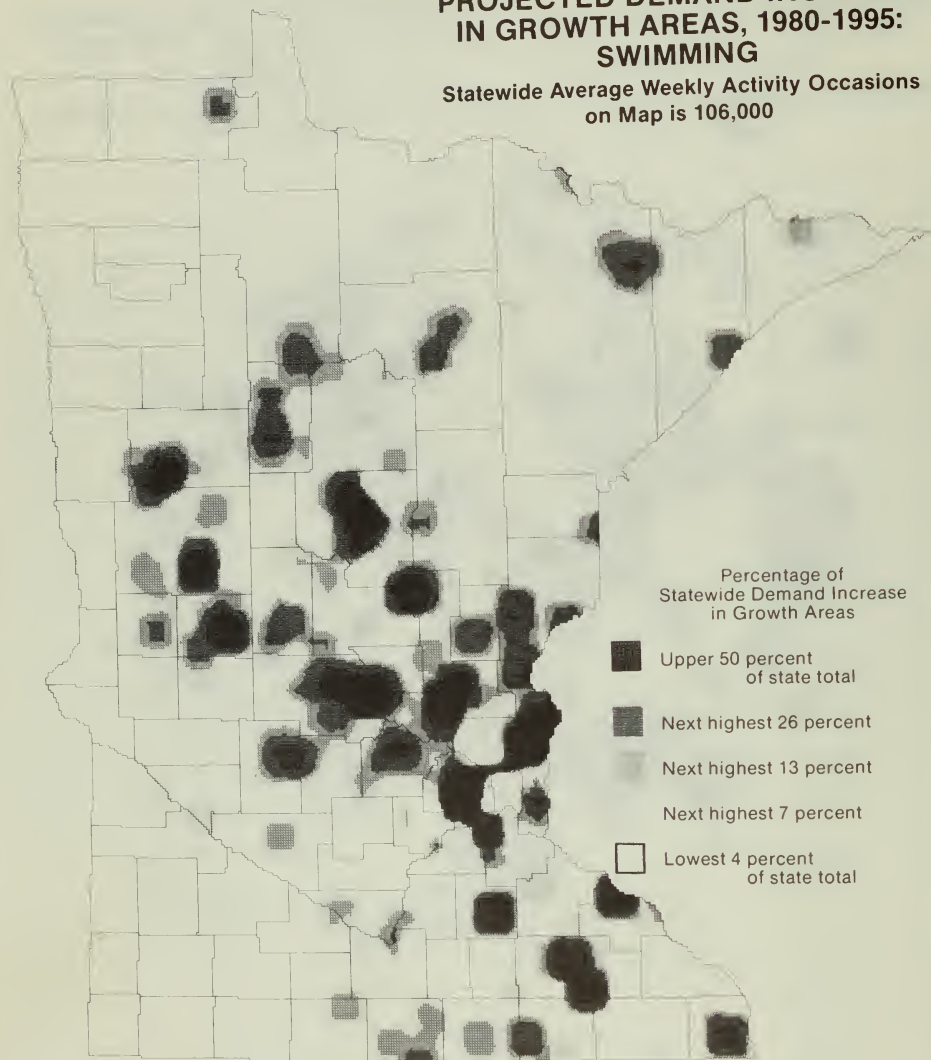
Statewide Average Weekly Activity Occasions
on Map is 110,000



0 20 40 miles
0 20 40 60 km.

FIGURE 6 PROJECTED DEMAND INCREASE IN GROWTH AREAS, 1980-1995: SWIMMING

Statewide Average Weekly Activity Occasions
on Map is 106,000

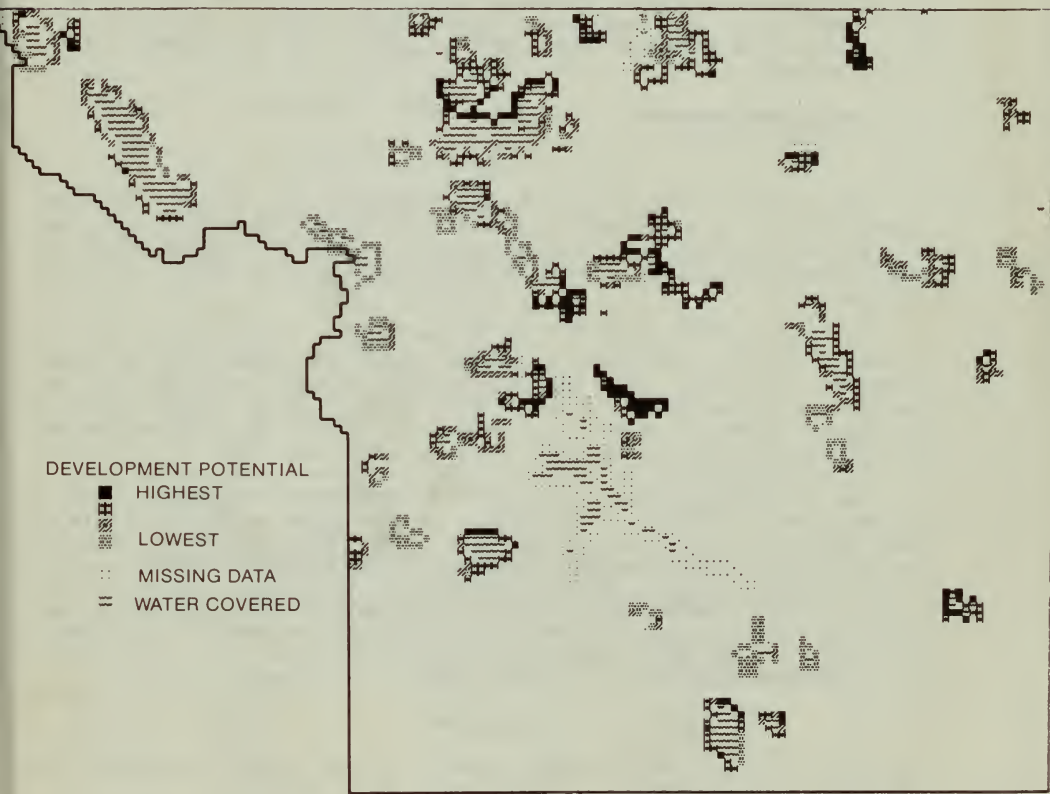


SOURCE: See Figure 4.

0 20 40 mil
0 20 40 60 km

FIGURE 7

LAKE-LOT DEVELOPMENT POTENTIAL IN THE SOUTHERN
ITASCA COUNTY PORTION OF THE NORTH CENTRAL LAKES REGION



MEASURING CAMPING TRENDS AT CORPS OF ENGINEERS CAMPGROUNDS

Janet Akers Fritschen

Abstract. This report describes the development, testing, and evaluation of a program for the collection of trend data on the characteristics of visitors at Corps of Engineers fee campgrounds. The results described herein indicate that the program is a cost efficient and effective method for the long-term monitoring of such factors as equipment usage, visit characteristics, and areas of origin. This information has application to planning, management, and research.

Additional keywords: Recreation, Data Collection, Visitor characteristics

The Corps of Engineers provides a diversity of outdoor recreation opportunities, including camping, picnicking, boating, swimming, fishing, and sightseeing. In 1983, there were 468 water projects which received recreation use. At these projects, a total of 480 million recreation days of use were reported.

In order to effectively plan for and manage these projects it is necessary to know something about the source and composition of their recreation use. This need for accurate and uniform data lead to the development of the Campground Receipt Study (CRS), a trend data collection procedure implemented at Corps fee campgrounds. Data collection for the CRS was initiated in 1979 and has continued every year since then.

The purpose of the Campground Receipt Study (CRS) is two-fold. First is the development of a workable methodology for collecting and analyzing data on Corps campers. This portion of the study has been accomplished. The second purpose of the CRS is to develop a data base on project campers which could be used, not only to characterize current camping populations, but to develop camping trends. The second purpose of the CRS can only be accomplished by the accumulation of a minimum of several years of data. The purpose of this paper is to describe the CRS methodology and the current and potential applications of the CRS data.

METHODOLOGY

Four factors guided the development of the CRS survey instrument and implementation procedures:

- a. The procedures and instrument were to have a minimum impact on visitors to Corps campgrounds.
- b. The procedures and instrument were to place a minimum burden on project personnel.
- c. The procedures were to be cost effective and cost efficient.
- d. The data collected were to be valid and reliable.

Work on the survey instrument and implementation procedures was initiated in 1978. The survey was first conducted during the summer of 1979. Based on the comments received from project managers and interviewers from that year and subsequent years of testing, the survey instrument was refined and the number of survey sites expanded. The implementation procedures first used were satisfactory and have remained the same since the program was initiated.

Survey Instrument

Due to the constraints described above, the survey instrument was designed to be quick and easy to administer yet, contain that information deemed essential for planning, management, and trend analyses. Column numbers were printed on the form for easy data entry. The current test form (Figure 1) contains the following data elements:

- a. area and site location information
- b. whether the permit is a renewal or not
- c. the respondent's zipcode
- d. type of permit (single family or group)
- e. number in party
- f. whether the respondent had visited the lake prior to this trip
- g. whether the lake was the primary destination of the respondent's trip
- h. the permit starting and ending dates
- i. the type and number of vehicles, camping equipment, and recreational equipment
- j. whether electric hookups were to be used
- k. whether a golden age or golden access permit was used
- l. number of nights paid
- m. fee paid

 U. S. ARMY -- CORPS OF ENGINEERS															SERIAL NUMBER SAMPLE												
USER PERMIT																											
DISTRICT		PROJECT					REC AREA			SITE NUMBER				RENEWAL	CAR LICENSE					ZIP CODE							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	STATE	NUMBER	16	17	18	19	20						
NAME OF CAMPER (OPTIONAL)							PERMIT TYPE	NUMBER IN PARTY			PRIOR VISITS		PRIMARY DESTINATION		STARTING DATE					END DATE							
							21	22			23	24	25	26		MO DAY YR					MO DAY						
															27 28 29 30 31 32					33 34 35 36							
VEHICLE(S)							CAMPING EQUIPMENT							RECREATIONAL EQUIPMENT													
37 ☐ CAR							43 ☐ TENT							49 ☐ POWERBOAT													
38 ☐ TRUCK							44 ☐ POP-UP TRAILER							50 ☐ SAILBOAT													
39 ☐ VAN							45 ☐ PICKUP CAMPER							51 ☐ OTHER WATERCRAFT													
40 ☐ MOTORHOME							46 ☐ TRAVEL TRAILER							52 ☐ BICYCLE													
41 ☐ MOTORCYCLE							47 ☐ NONE							53 ☐ MOTORCYCLE													
42 ☐ OTHER							48 ☐ ELECTRIC HOOKUP							54 ☐ ORV (NONMOTORCYCLE)													
							49							55 ☐ OTHER													
1. GOLDEN AGE NO.							NIGHTS PD.							TOTAL FEE PAID							ATTENDANT						
2. GOLDEN ACCESS NO.							56 57 58							59 60 61 62 63													

ENG FORM 4457(TEST), Jan 83

EDITION OF FEB 82 IS OBSOLETE. (Proponent: DAEN-CWO-R)

RSCAL

Figure 1.--Campground Receipt Study test form.

The test form is administered to all campers in the study areas. It is usually completed by Corps rangers or contract personnel as the campers register at the campground entrance booth. In the absence of a booth, a roving ranger administers the test form.

Survey Sites

In 1979, the test forms were administered during a portion of the summer season at one recreation area per each of three Corps lakes. Currently, there are sixteen water projects participating in the study (Figure 2), all of which are part of the Corps' natural resources research and demonstration system. At these projects, the survey form is administered during the entire fee season at a total of 75 recreation areas.

Data Analysis Procedures

To complete the development of a useable package, two computer programs were developed to analyze the CRS data. The first program, the Recreation Analysis Program (RAP), provides two types of output: the Area Report and the Site Specific Data Report. The Area Report (Figure 3) provides a summary by recreation area of all of the data contained on the test form. The Site Specific Report (Figure 4) is a summary of selected data by site within the recreation area.

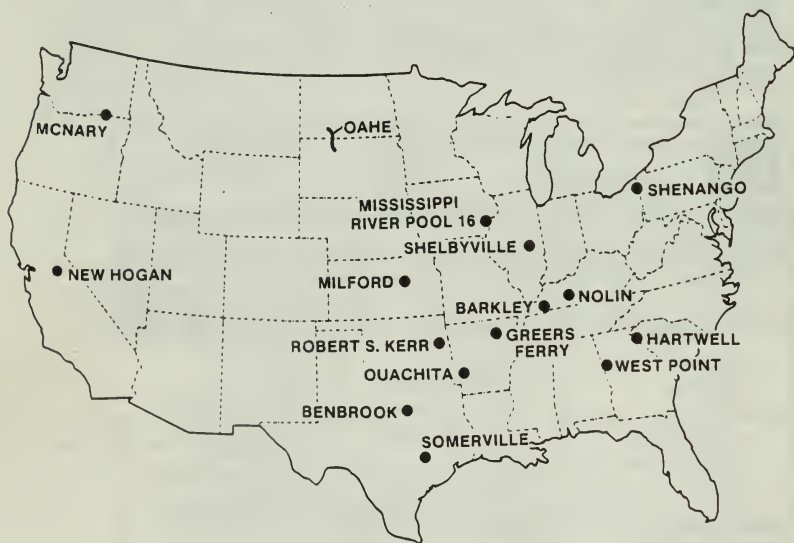


Figure 2.--Corps water projects currently participating in the Campground Receipt Study.

PROJECT NO.	940	REC AREA NO.	105
-------------	-----	--------------	-----

VEHICLE	GROUP TOTAL			VEHICLE TOTAL			CAMPING EQUIPMENT			GROUP TOTAL			EQUIP. TOTAL			
	NO.	PCT.	NO.	PCT.	NO.	PCT.	NO.	PCT.	NO.	PCT.	NO.	PCT.	NO.	PCT.	NO.	PCT.
CAR	764	43.3	764	34.5	284	15.7	284	15.4	POWEROAT	632	34.9	632	34.9	432	1.0	
TRUCK	166	9.2	166	7.7	166	9.2	166	9.2	TRUCK	0	0.0	0	0.0	0	0.0	
MOTORHOME	363	20.0	363	16.0	363	20.0	363	20.0	OTHER WATERCRAFT	0	0.0	0	0.0	0	0.0	
MOTORCYCLE	6	0.3	6	0.3	363	41.6	363	41.6	BICYCLE	40	2.2	40	2.2	40	1.0	
MISSING	0	0.0	0	0.0	363	20.0	363	20.0	MOTORCYCLE	25	1.4	25	1.4	25	1.0	
					0	0.0	0	0.0	OTHER	11	0.6	11	0.6	11	0.3	
					0	0.0	0	0.0	OTHER	133	7.3	133	7.3	133	1.0	

USER CHARACTERISTICS

	3477	NIGHTS PAID	7901	PRIOR VISITS	YES
		PER DAY/GROUP, AVG.			PCT.
		TOTAL REC DAYS OF USE	23990	PRIMARY DESTINATION	NO.
CAMPING PERMITS					
CARPING GROUPS					
PARENTS					
PRESBYTERIAN, AVG.					
TOTAL FEES PAID					
REIMBURSEMENTS					
	\$ 4789.44				
	1666				
		PERMIT TYPES			
		NO. OF GROUP CAMP PERMITS	0		PCT.
		GROUP CAMP REC DAYS		NIGHTS PAID	NO.
					1705
					7786
					97.5

NOTE 1: (4 PERMITS SHOW ZERO FEE)
(0 PERMITS SHOW ZERO PERSONS IN PARTY)
(0 PERMITS SHOW ZERO NIGHTS PAID)
(0 PERMITS SHOW BOTH ZERO PERSONS, NIGHTS

NOTE 2: For vehicle and camping and recreational equipment categories the group total is the number of groups that have one or more of the specified items, the vehicle or equipment totals are the total number of the specified items recorded. For example, a group with two cars would be counted once under the group total and twice under the vehicle total for cars. The group fifth total is number of groups that had one or more of the specified items divided by the total number of groups; the column total is ≥ 100 percent since groups may have more than one type of vehicle or equipment. Vehicle and equipment percentages are the total for each item divided by the column total and should equal 100 percent (except for rounding). The average avg. 1 column under recreational equipment is the total number of each item recorded divided by the number of groups that had one or more of that item with them.

Figure 3.—The Area Report, part of the Recreation Analysis Program, provides a summary of the CRS data by recreation area. This example is from the 1993 data for Canal Recreation Area, Lake Barkley.

SITE SPECIFIC DATA REPORT

PROJECT NO. 940 REC AREA NO. 105

DATE	SITE	TOT MIGHTS	TOT MIGHTS	AVG. NO.	TOT REC	TRMT	POP-UP	PICK-UP	TRAVEL TRAILER	PHOTODIODE	MOBILE
		OCCLUDED	ELEC USED	GROUPS	DAYS	(PCT)	(PCT)	(PCT)	(PCT)	(PCT)	(PCT)
0062	54	57	15	11	202	10.0	50.0	20.0	35.0	20.0	5.0
0063	55	67	19	3.8	233	21.1	15.8	5.3	31.6	53.3	20.0
0064	67	67	25	3.4	309	20.0	8.0	4.0	52.0	26.3	8.0
0065	65	62	25	3.4	309	20.0	8.0	4.0	52.0	26.3	8.0
0066	75	75	19	2.1	217	21.5	15.8	5.3	31.6	53.3	20.0
0067	74	74	19	3.1	247	21.1	15.8	5.3	31.6	53.3	20.0
0068	104	104	21	3.3	307	19.5	26.8	0.0	47.6	14.3	0.0
0069	74	74	19	3.1	247	21.1	15.8	5.3	31.6	53.3	20.0
0070	60	60	19	3.4	252	10.5	10.5	0.0	73.7	5.3	0.0
0071	65	65	19	3.1	255	12.9	12.9	0.0	73.7	5.3	0.0
0072	85	85	13	3.2	356	12.9	12.9	0.0	73.7	5.3	0.0
0073	158	158	38	3.6	578	15.8	15.8	13.2	36.8	58.1	6.5
0074	153	153	34	3.7	597	17.6	17.6	5.9	68.7	15.8	2.8
0075	133	131	34	3.3	544	23.3	10.9	6.7	50.0	17.6	2.8
0076	154	151	30	3.7	566	23.3	10.9	6.7	50.0	17.6	2.8
0077	130	130	25	3.2	365	20.0	16.0	6.0	36.0	20.0	4.0
0078	136	136	34	3.4	617	11.8	8.8	14.7	38.2	20.6	5.5
0079	163	162	38	3.4	528	2.6	13.2	10.5	39.5	23.7	10.0
0080	172	172	30	3.4	600	10.5	15.8	13.1	47.4	15.7	8.0
0081	167	167	30	3.4	590	11.1	11.1	7.4	40.0	10.5	0.0
0082	152	157	27	3.4	550	23.8	19.0	19.0	19.0	14.3	4.0
0083	118	118	21	3.0	350	23.8	19.0	19.0	19.0	14.3	4.0
0084	143	143	34	3.3	624	14.7	17.6	8.8	55.9	5.9	0.0
0085	67	66	19	3.3	291	5.3	15.8	15.3	52.1	24.3	0.0
0086	105	105	31	3.4	349	16.1	19.4	12.9	35.5	9.7	9.0
0087	109	109	31	3.4	349	16.1	19.4	12.9	35.5	9.7	9.0
0088	69	68	28	2.8	232	21.4	17.9	0.0	32.1	25.0	0.0
0089	90	90	26	2.7	300	3.8	11.5	0.0	42.3	34.6	7.0
0090	102	102	28	2.7	300	10.7	17.9	0.0	42.3	34.6	7.0
0091	124	124	27	2.7	300	10.7	17.9	0.0	42.3	34.6	7.0
0092	124	124	27	2.7	300	10.7	17.9	0.0	42.3	34.6	7.0
0093	110	109	30	2.9	325	20.0	6.7	13.3	33.3	44.4	0.0
0094	107	106	26	2.3	247	11.5	3.8	3.8	46.2	34.6	0.0
0095	167	167	35	2.7	524	8.6	8.6	11.6	35.7	21.9	2.0
0096	134	134	31	3.1	410	9.7	3.2	0.0	54.0	32.3	0.0
0097	133	132	31	3.1	410	9.7	3.2	0.0	54.0	32.3	0.0
0098	133	130	27	2.8	401	3.7	18.5	3.7	33.3	33.3	11.0
0099	83	83	22	3.2	349	21.7	13.0	8.7	26.1	30.4	0.0
0100	98	98	23	3.4	599	9.1	22.7	6.1	50.0	15.5	3.0
0101	106	106	26	2.6	281	19.6	12.8	9.5	36.1	9.5	19.0
0102	98	98	23	3.2	349	21.7	13.0	8.7	26.1	30.4	0.0
0103	95	94	36	3.7	351	36.1	11.1	8.3	36.1	11.1	0.0

FROM 4/ 1/83 TO 10/29/83

Figure 4. -- The second report from the Recreation Analysis Program, the Site Specific Report, contains a summary of selected CRS data by campsite within each recreation area. This example is from the 1983 data for Canal Recreation Area, Lake Barkley.

The second program developed to utilize the CRS data provides summaries not only by recreation area, but by the visitors' counties of origin. This information is extracted from the zipcode data. The inclusion of county population figures allows the calculation of visitation statistics as a portion of the county population.

The District offices responsible for each CRS project are provided with a copy of the RAP program to be run when they choose. Since the zipcode program requires computations and data entry beyond the test form, it is not sent to the Districts but is available upon request.

APPLICATION OF THE CRS DATA

The CRS data have served and have the potential to serve a variety of purposes in planning, management, and research. Since the CRS is part of an ongoing research effort, the data are submitted to the Waterways Experiment Station (WES) after the completion of a calendar year of data collection. The data are run through the RAP program and additional analyses are performed as examples of possible uses of the data. The results of these analyses are published and distributed each year.

These summaries of the CRS data provide a profile of the recreation use at each of the CRS study areas. Additional information can be obtained through comparisons of different recreation areas at one project (Table 1), different projects within the CRS (Table 2), and different years of data (Figure 6).

Table 1.--CRS results for study areas at Lake Barkley, 1984*

Characteristic	Recreation Area				
	Eureka	Canal	Hurricane Creek	Devils Elbow	Project Totals
Number of camping permits*	599	3,477	1,709	755	6,540
Number of camping groups	434	1,811	1,382	636	4,263
Recreation days of use	4,079	23,990	13,807	4,033	45,909
Mean length of stay (nights)	2.77	4.36	3.24	1.87	3.46
Mean number in group	3.39	3.16	3.21	3.26	3.21
Percent prior visits**	66.8	56.9	24.3	6.8	39.8
Percent primary destination**	63.4	56.9	88.1	69.2	69.5
Percent golden passports**	17.5	60.6	29.3	3.8	37.6

* From Fritschen (forthcoming)

* Includes renewal permits

** Percent of camping groups

Table 2.--1983 Use characteristics for entire CRS sample*

Project	Recreation days	Mean length of stay nights	Mean number in group	Percent prior visits*	Percent primary destination*	Percent golden age/access passports*
Lake Barkley	45,909	3.46	3.21	39.8	69.5	37.6
Benbrook Lake	43,040	2.23	3.75	50.5	74.4	24.3
Greers Ferry Lake	171,323	2.29	3.48	71.3	76.8	23.9
Hartwell Lake	81,506	2.94	3.78	68.1	77.9	20.2
McNary Lock & Dam	13,379	1.82	2.84	41.7	42.8	52.9
Milford Lake	27,913	2.20	3.67	67.3	81.4	14.5
New Hogan Lake	49,952	3.05	3.15	62.8	83.1	35.0
Nolin River Lake	13,081	1.74	3.56	32.8	90.7	3.7
Lake Oahe	43,854	2.21	3.15	44.2	44.6	31.4
Lake Ouachita	79,050	3.01	3.93	65.9	80.3	15.0
R. S. Kerr Lock & Dam	13,404	2.54	3.77	76.9	90.8	48.4
Lake Shelbyville	140,687	2.95	3.48	70.8	93.5	18.5
Shenango River Lake	67,006	3.58	4.05	86.9	97.1	26.7
Somerville Lake	125,162	2.07	4.26	53.5	67.0	20.9
West Point Lake	84,529	2.94	3.38	80.7	76.5	37.8
Entire CRS sample	999,795	2.58	3.62	64.0	76.4	25.1

* From Fritschen (forthcoming)

* Percent of camping parties

Among the current applications of the CRS data base are the following. Rangers at one project use the vehicle and camping equipment data on a day-to-day basis to ensure that there are not more occupants at a campsite than are registered. Results from the RAP reports were used at two other lakes to evaluate current and potential usage of electric hookups. The zipcode data have been analyzed by staff at one project to determine their market area and at another to develop project brochures. In a WES research effort, the CRS data have been combined with resource characteristics to examine visitor preferences for campsites and recreation areas. Finally, the visitor profile data have been used by private firms under contract to state agencies to examine recreation use in a region.

Although the CRS data have been used for a variety of purposes, there are a great number of potential uses of the data base. The data could be used to calculate the number of test forms completed on a daily, weekly, monthly, or seasonal basis. These results could be used in scheduling personnel and maintenance activities. The number of people and the sites occupied could be analyzed by day of the year. This could be done by recreation area and by campsite to reveal peak and low use patterns. An analysis of certain

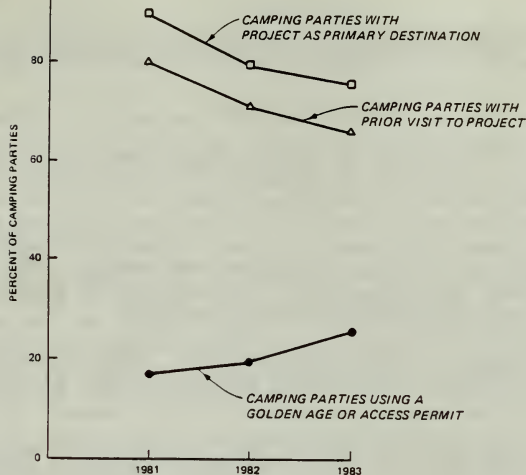


Figure 6.--Trend information can be obtained by comparing several years of CRS data (Fritschen forthcoming). Data from 1979 and 1980 were not included as the survey instrument, survey season, and study sites differed substantially.

variables, such as equipment type and Golden Age/Access passports, by month may reveal seasonal trends which could be important to managers.

Additional information could be obtained by examining multiple years worth of CRS data. For example, an analysis of user characteristics over time could indicate changes in users or use patterns. This, in turn, could be used to determine whether existing facilities are meeting user needs, whether additional or different facilities are needed, and where to locate these facilities. With enough historical data, it is also possible to evaluate the effects on recreation use of external factors such as fuel shortages and changing leisure patterns.

SUMMARY

The Campground Receipt Study was designed to provide a workable and accurate method for collecting data on recreation users of Corps fee campgrounds. Through several years of testing and refinement this purpose has been accomplished. The second purpose of the CRS was to produce a data base on Corps campers that could provide both a current profile of users and trend information. This year, 1985, will be the fifth year that comparable data have been collected. The CRS data base has already been used for planning, management, and research purposes. With the growing amount of data, it is anticipated that it will be of even greater value in the future.

LITERATURE CITED

- Fritschen, J. A. forthcoming. Summary of the 1983 Campground Receipt Study. Miscellaneous Paper, US Army Engineer Waterways Experiment Station, Vicksburg, Miss.

PREDICTING THE DIRECTION OF PARTICIPATION RATE TRENDS
WITH THE STATUS GROUP DYNAMICS APPROACH TO RECREATION DEMAND

Patrick C. West

Abstract.-- Research on the status group dynamics approach to recreation demand prediction is summarized in this paper. A recreation trends prediction technique based on this approach is reviewed. Tests of prediction accuracy indicate that the status group dynamics prediction model is a more effective predictor of future participation rates than other methods examined. The potentials and problems of implementing this approach in professional practice in a cost effective manner are discussed.

Additional keywords: Status group dynamics, demand prediction, status based diffusion, status group barriers, recall accuracy.

The attempt to achieve accurate and reliable recreation demand projections remains the Achilles' heel of regional recreation planning. A key problem has been the inability to anticipate changes in recreational fads and fashion that create changes in participation rates. In this paper a new sociological approach to this problem is discussed. The method has been called the "status group dynamics approach." It involves the application of sociological theories of status group processes and their effect on the dynamics of leisure life styles.

In this paper the theories and central concepts from which this model was developed are discussed and research that has tested these notions is reviewed. Based on this research, a projection technique was developed that combines the use of longitudinal recreation trends with estimates of projected changes in the direction and rate of participation rate growth or decline in the future. Results of empirical tests of the prediction accuracy of this approach in comparison to the prediction accuracy of other standard prediction methodologies are summarized based on a five year longitudinal study. The potentials and problems of implementing this prediction model in professional practice are discussed. Particular attention is given to the accuracy of recall data as a cost conscious means of collecting trend data.

THE STATUS GROUP DYNAMICS APPROACH

The status group dynamics model employs socioeconomic correlates of participation in a different way than usual. In the standard socioeconomic correlate approach, changes in the proportions of persons in socioeconomic predictor variable categories are used to predict changes in demand (Clawson and Knetsch, 1966; Cicchetti, 1973). This method assumes that participation rates within subgroups will remain stable over time. Previous research (West, 1977, 1981a) indicates that subgroup participation rates do not remain stable, but that they often follow definite and predictable patterns of change related in part to the dynamics of status processes. Thus, in the status group dynamics approach, these changing patterns are examined by tracing over time, growth, stability, or decline in participation rates within categories of socioeconomic indicators. Predictions are based not on projected changes in

socioeconomic factors, but rather on anticipated shifts in the growth or decline of participation rates within socioeconomic groups.

From the theoretical literature and our previous research, three key conceptual models are discussed that may help to describe and predict leisure life style changes in recreation trends. These are "status based diffusion," "status based withdrawal," and "status group barriers."

Status Based Diffusion

Thorstein Veblen (1953, originally 1899), observed that in American society the styles of leisure, taste, and consumption of the elite are often adopted by those lower in the status hierarchy as a means of status mobility. More recently this process has been discussed by Meyersohn and Katz (1958), Fallers (1966), and Packard (1962). Other closely related lines of research include research on the diffusion and adoption of innovations (e.g. Rogers and Shoemaker, 1971; Rothman, 1974: 417-483) and consumer marketing (e.g. Ward and Robertson, 1973; Rogers, 1976; Levy and Zaltman, 1975; King, 1964). The model of "status based diffusion" was derived from this previous theory and research and is defined as:

The process in which the leisure and recreational patterns of one (usually higher) stratum are emulated and adopted by other (usually lower) strata as a means of status enhancement, thus creating a spread (diffusion) of the leisure style across strata and a corresponding growth in the overall participation rate (West, 1977: 198).

Status Based Withdrawal

It has been found that once an activity had diffused to a substantial proportion of low status persons it started to level off, and in some cases decline (West, 1981a; 1977). In other words, when an activity loses its status exclusiveness, the drive for interpersonal emulation begins to lose steam, thereby initiating a "status based withdrawal." In past research we had expected theoretically to find that high status groups would be the first to withdraw following extensive diffusion to low status groups. We found, however, that when withdrawal was beginning, it was primarily among middle status groups (West, 1981a). The reasons for this are still unclear.

Status Group Barriers

It has also been observed that certain strata remain resistant to diffusion, especially the low education, low income stratum (West, 1977, 1981a). This is more than an income constraint because other low income strata with middle and high education often experience rapid growth in participation rates, while the low education, low income stratum experiences little or no growth in participation. From this type of data we can speculate that status groups may have "boundary maintaining mechanisms" (Burch and Cheek, 1976) that can maintain internal life styles and prevent or inhibit the diffusion of higher status group life styles. The relative power of these "status group

barriers" may play a large role in determining the extent of recreation participation rate growth.

RESEARCH RESULTS

The status group dynamics approach was tested in a variety of research studies. Early studies in Northeast Wisconsin (West, 1977, 1981a) tested the basic concepts in the model and found consistent empirical trends that supported the model. These early studies relied on recall data to establish trend data over a five year period. These data were cross tabulated with education and income for each of the time periods. An example, of the trend data by status groups is shown in Table 1 from West (1977: 207). Results of these early studies were used to make experimental projections of stability and change in future participation rates for several county and regional recreation planning studies (West et.al, 1975; West et.al., 1976a; West et.al., 1976b, West et.al. 1978).

TABLE 1
DIFFUSION OF GOLFING PARTICIPATION IN BROWN COUNTY FROM 1970 TO 1975

Past: 1970				Present: 1975				
Education				Education				
				High	Medium	Low		
Income	High	(17) 20%	(23) 21.7%	(3) 12%	High	(20) 35.1%	(36) 34%	(3) 12%
	Medium	(2) 5.6%	(19) 12.3%	(3) 6.7%	Medium	(4) 11.1%	(34) 22.1%	(5) 11.1%
	Low	*	(8) 13%	(2) 5.4%	Low	*	(6) 10%	(4) 10.8%

Note: Large arrows indicate major diffusion; small arrows indicate minor diffusion.

Statistical Significance—1970: $\chi^2 = 42.14$, $P = .01$; 1975: $\chi^2 = 46.57$, $P = .01$; change from 1970 to 1975: $\chi^2 = 30$, $P = .01$ (see note 5 in text).

*Insufficient sample size. (Contributions to the χ^2 were not calculated for these cells.)

These initial studies were followed by a set of replication studies on nationwide data sets from the periodic national recreation surveys conducted by the Bureau of Outdoor Recreation (West 1982a, 1982b). In these studies trend data was drawn from two cross-sectional data sets from 1972 and 1977 that were roughly comparable (Blahna, 1981). These studies were not based on true longitudinal data in which the same individuals are followed over time. But they were an improvement over previous studies that had relied on recall data. Because they were national samples results were also more generalizable than the earlier regional studies.

Collectively these studies of the diffusion of outdoor recreation activities found consistent support for the status based diffusion model (West, 1977, 1981a, 1982a, 1982b). Veblen hypothesized that emulation would be greatest between adjacent strata (Veblen, 1953: 70). Thus, we theoretically

expected, and usually found (West, 1977, 1981, 1982a), that diffusion occurred from high status leading strata to adjacent middle strata more strongly and prior to diffusion to lower strata. In West (1982b) rural urban differences in the dynamics of status based diffusion were found.

In these four studies only aggregate patterns of diffusion across the status group structure over time were measured. In these studies it was assumed theoretically that the process through which this diffusion occurred was heavily influenced by interpersonal influence in which high status persons influenced the adoption of activities by lower status persons. The role of interpersonal influence in status based diffusion was empirically tested in a followup study in Northeast Wisconsin (West, Forthcoming 1985). In this study it was found that interpersonal influence was a major factor in the adoption of new outdoor recreation activities. Influencers tended to be close to adopters in status ranking, and tended to have equal or slightly higher status ranking than adopters. This study provided support for the proposition that a major dynamic causal process in the aggregate patterns of diffusion over time involves status based interpersonal influence.

All of the above studies were based on trends in participation rates within a given regional context. Participation rates were calculated as a proportion of the sample who participated. This type of data can be utilized in regional recreation demand projections where the bulk of recreation participation comes from people within the region. In this form, however, it cannot be used to assess demand trends for particular sites. Thus an additional followup study of trends in backcountry canoe camping was conducted in the Sylvania Recreation Area in the Upper Peninsula of Michigan to test the adaptability of the status group dynamics model for particular recreation site demand estimation (West, 1981b). In this study, participation rates could not be used because all users sampled were by definition participants. Instead trends in the proportion of users in different status groups was measured over time. This study also used recall data based on a sample of past users of the area as a basis for studying trends. Again patterns of status based diffusion were found. There was a slight increase over time in college educated persons and a slight decrease in the proportion with post graduate education. This may indicate a slight diffusion from very high education to high education status groups. Diffusion patterns were more pronounced in income strata. The proportion of users with middle income increased significantly (11.7%) over a five year period, while the proportion of high income persons decreased (-12.5%). Thus, it appeared that there had been a diffusion of backcountry canoe camping at Sylvania from high income and very high education status groups towards high education, middle income status groups (West, 1981b: 134-135).

In summary, there has been a consistent pattern of empirical support for the status group dynamics approach to understanding the social processes that underlie recreation participation rate change. The reader is referred to the original sources for further details on the theoretical basis and empirical tests of the model. In the course of this research a method of using the status group dynamics approach in making demand predictions was developed. Projections using this method were made and then tested in a longitudinal followup study five years later.

The prediction model that was developed was based on a theoretically guided projection of cell-by-cell participation rates. A "cell" is defined as a social stratum with a specific combination of education and income, as shown in Table 1 above. The model provides a systematic calculation of the number of cells affected by diffusion (or other patterns), the size of those cells, and their combined effect on the overall participation rate. Projections of future participation rates are made within each cell. Projections are then summed over all cells into an overall projection of the participation rate.

Estimates of future participation rates for each cell are derived from a combination of:

1. the overall patterns or combination of patterns that approximate the theoretical constructs (diffusion, withdrawal, barriers, and so on);
2. the specific location of a particular cell within the overall pattern; and
3. the empirical trends in participation rates over time in that particular cell.

Because this process relies upon a theoretically guided judgement, both point and range estimates are employed in making the projections. The point projection is the best single estimate of the future cell participation rate. Upper and lower range estimates are also made using assumptions of higher or lower rates of change in cell participation rates.

The greater the uncertainty over the degree of stability, or the rate and extent of change in future cell participation rates, the wider the range is set. For instance, from the empirical and theoretical analysis, it may be quite likely that a particular cell will experience continued growth due to status based diffusion. But it is not entirely clear how much growth will occur. In this situation a point projection is made representing the best estimate of the rate of increase, but the range is widened, usually with a wider upper range to account for the possibility of a more rapid rate of diffusion into that cell. Wide ranges in some volatile cells are balanced by narrower ranges in stable cells, thus keeping the overall range narrow enough to be valuable for planning purposes.

The analyst begins the projection process with a thorough theoretical analysis of the empirical patterns of participation rates for each panel year of data (such as that in Table 1 above) using the concepts discussed above. A straight line projection of each cell participation rate is used as an initial estimate and then adjusted upward or downward on the basis of theoretical considerations. For instance, if diffusion is rampant in adjacent higher status cells, future growth in a particular cell may occur at a faster rate than in the past, so the rate of projected change in that cell might be adjusted upward beyond the initial straight line estimate. Once the point and range projections are determined for each cell, the aggregate point and range estimates are determined using a weighted summation formula in which the effect of each cell is weighted by the proportion of the total persons in the

sample that fall within each cell. A more detailed discussion of the projection method can be found in West (1983) and West and Blahna (1980).

TEST OF PROJECTION ACCURACY

A test of the the accuracy of this prediction model was conducted in a longitudinal study. Using data from 1975 and recall data from 1970 projections were made for an eight county region to 1980 (West et.al., 1978). A longitudinal study of the same respondents was conducted in 1981 for the previous year (1980) to test the accuracy of predictions for that year (West, 1983). The accuracy of the status group dynamics prediction model was compared with the accuracy of two other standard regional recreation demand prediction models: (1) a straight line projection of the overall participation rate trend for the 1970-75 period, and (2) an assumption of stable participation rates for the 1975-1980 period.

In most cases, the status group dynamics projections accurately predicted the direction of participation rate trends. In all cases where we predicted an increase in participation rates, an increase occurred. For one activity (snowmobiling) we predicted a decline for both men and women, even though there was no empirical decline in the 1970-75 trends, and for both a decline actually occurred (West, 1983: 29).

The total prediction error for the status group dynamics approach for men was not statistically significant. The total prediction error for the status group dynamic approach for men (11.8%) was almost half the error for the other two approaches (21.4% and 21.9%). The total prediction error for the status group dynamics approach for women (16.4%) was also less than the the error in the other two approaches (21.05% and 21.8%). Thus, the status group dynamics predictions did quite well in predicting the direction of participation rate changes over the five year projection period, and reasonably well, especially for men, in predicting the magnitude of changes in comparison with other standard projection techniques (West, 1983: 31-33).

An analysis of systematic projection errors suggested a variety of ways in which the assumptions and hypotheses in the model might be refined. These modified hypotheses should be tested in future research and, if supported, will help improve the accuracy of the future projections (West, 1983: 39).

POTENTIAL FOR PROFESSIONAL APPLICATION

Research to date suggests a strong potential for applicability to professional practice as a tool in regional recreation trend prediction. Further theoretically oriented research will increase the accuracy of the approach. However, there are a number of considerations and problems involved in professional application to recreation planning beyond the need for more theoretical research to improve the model.

First, because the approach does depend on the analyst's judgement in the use of the theoretical models, we should have continued concerns about the reliability of the technique as used by different analysts. One important area for future methodological research, therefore, would be to conduct controlled tests of the reliability of projections for the same activities and

data sets made by different analysts who are thoroughly and equally trained in the use of the theory and projection technique (West, 1983: 39-40).

Second, applicability in professional practice depends not only on substantive validity but also on cost effectiveness. A particular approach to predicting recreation trends may be effective but too costly for planners to adopt as a practical planning tool. Two major cost factors need to be considered in relation to the status group dynamics approach. First, the technique necessarily depends on skilled expertise in using the theory and prediction approach. Second, the data requirements for using the prediction model require region specific data gathering including comparable data on trends over time. The best type of trend data is obviously true longitudinal data that follows the same individuals over time for at least five years. Gathering this type of data is both costly and time consuming. Multiple cross-sectional studies of samples from the same regional population at different points in time are the next best substitute. However this too is costly, and problems of comparability of the samples can introduce systematic error into the analysis (See for example Blahna, 1981).

The lowest cost alternative is to use recall data as part of a single cross-sectional survey design. However, the general methodological literature raises questions about the validity of recall data (e.g. Menzel, 1957; Coughenour, 1965; Rogers, 1983: 112-118). As one aspect of the 1981 longitudinal regional study (West, 1983) we tested the reliability of recall data from 1980 back to 1975 against the actual rates for 1975 (West, undated). In general, this research found that the sample tended to over estimate past participation in varying degrees over the five year recall period. It is quite likely that this is because people cannot quite remember what exact year they may have participated in a particular activity, thus causing them to include participation over a longer period of time than the boundaries of a single year recall period. If this is so then trend lines used for initial estimates would tend to be flattened somewhat (i.e. show slower rates of growth) than may actually be the case. One attempt to minimize this recall error problem involved the use of a shorter time period of two years (West et.al. 1983). This no doubt reduced the recall problem. However, the recall period was so short that it was not useful in establishing reliable trends.

Further methodological research might test two alternative ways of minimizing recall inaccuracy. Research might test whether asking respondents to think sequentially back over the years would reduce recall error. Instead of asking what they did five years ago, questions might be phrased to ask what they did one year ago, two years ago, three years, four years, and five years ago. This might help respondents sort out and think through the time frames of participation in different activities. Another approach might be to replicate the methodological study of recall accuracy of past recreation participation. If empirical regularities in the direction and magnitude of recall inaccuracy emerge from this replication research it is possible that a standardized adjustment factor could be applied to recall data that would tend to minimize recall error problems. This methodological research on recall accuracy would contribute not only to the status group dynamics approach but also to other recreation trend analysis and prediction approaches that utilize recall data.

LITERATURE CITED

- Blahna, D. 1981. A comparability analysis of the 1972 and 1977 Bureau of Outdoor Recreation nationwide surveys. University of Michigan, Natural Resource Sociology Research Lab, Working Paper #1.
- Burch, W.R. Jr. and Cheek, N. 1976. The Social Organization of Leisure in Human Society. New York: Harper and Row.
- Cicchetti, C.J. 1973. Forecasting recreation in the United States. Lexington, Mass.: Lexington Books.
- Clawson, M. and Knetsch, J. 1966. Economics of outdoor recreation. Baltimore: Johns Hopkins Press.
- Coughenour, C.M. 1965. The problem of reliability of adoption data in survey research. Rural Sociology 30: 184-203.
- Fallers, L.A. 1966. A note on the "trickle effect." In R. Bendix and S.M. Lipset (eds.) Class, Status, and Power, p. 402-405. N.Y.: The Free Press.
- King, C.W. 1964. The innovator in the fashion adoption process. Proceedings of the Conference of the American Marketing Association, Chicago.
- Levy, S.J. and Zaltman, G. 1975. Marketing, Society, and Conflict. Englewood Cliffs, N.J.: Prentice Hall.
- Menzel, H. 1957. Public and private conformity under different conditions of acceptance in the group. Journal of Abnormal and Social Psychology 55: 398-402.
- Meyersohn, R. and Katz, E. 1958. Notes on the natural history of fads. In E. Larrabee and R. Meyersohn (eds.) Mass Leisure, p. 305-314. Glencoe, Ill: The Free Press.
- Packard, V. 1962. The Status Seekers. N.Y.: Basic Books.
- Rogers, E.M. 1976. New product adoption and diffusion. Journal of Consumer Research 2: 290-301.
- Rogers, E.M. 1983. Diffusion of Innovations. New York: The Free Press.
- Rogers, E.M. and Shoemaker, F. 1971. Communication of Innovations: A Cross Cultural Approach. New York: The Free Press.
- Rothman, J. 1974. Planning and Organizing for Social Change. New York: Columbia University Press.
- Veblen, T. 1953. The Theory of the Leisure Class. New York: Mentor Books (originally published in 1899).
- Ward, S. and Robertson, T.S. 1973. Consumer Behavior: Theoretical Sources. Englewood Cliffs, N.J.: Prentice-Hall.

- West, P. 1977. A status group dynamics approach to predicting participation rates in regional recreation demand studies. *Land Economics* 53: 196-211.
- West, P. 1981a. The acceleration and deceleration of outdoor recreation fads. In T. Napier (ed.) *Outdoor Recreation Planning Perspectives and Research*, p.155-172. Debuque, Iowa: Kendal-Hunt Publishing.
- West, P. 1981b. Status forces in the rise and decline of site specific tourism demand. In J.D. Fridgen and D.J. Allen (eds.) *Michigan Tourism: How Can Research Help?* p. 133-136. East Lansing, MI: Department of Park and Recreation Resources, Michigan State University.
- West, P. 1982a. A nationwide test of the status group dynamics approach to outdoor recreation demand. *Leisure Sciences* 5: 1-18.
- West, P. 1982b. Rural-urban differences in the status based diffusion of outdoor recreation fads. *Michigan Academician* 15: 35-57.
- West, P. 1983. A test of the projection accuracy of the status group dynamics approach to recreation demand. *Leisure Sciences* 6: 15-45.
- West, P. Forthcoming 1985. Interpersonal influence and the status based diffusion of outdoor recreation fads. *Journal of Leisure Research*, in press.
- West, P. Undated. The use of recall questions in establishing outdoor recreation use trends for research and planning: A methodological test of recall accuracy. In preparation, University of Michigan, School of Natural Resources.
- West, P.C. and Blahna, D.J. 1980. Status Groups and Recreational Styles: Sociological Perspectives and Planning Applications. Ann Arbor: University of Michigan, School of Natural Resources, Natural Resource Sociology Research Lab.
- West, P.C. et.al. 1975. Sheboygan county recreation demand study. Appendix A, Open Space and Outdoor Recreation Plan. Sheboygan, Wisconsin: Sheboygan County Planning and Resources Dept.
- West, P.C. et.al. 1976a. Marinette county recreation demand study. Prepared for the Bay Lakes Regional Planning Commission, Green Bay, Wisconsin.
- West, P.C. et.al. 1976b. Brown county recreation demand study. Prepared for the Green Bay- Brown County Planning Commission.
- West, P.C. et.al. 1978. Bay lakes regional demand projection report. Prepared for the Bay Lakes Regional Planning Commission, Green Bay, Wisconsin.
- West, P.C. et.al. 1983. Michigan State Parks Travel Trailer and Motor Home Owner Survey. Conducted for the Michigan State Parks by the University of Michigan, School of Natural Resources.

MONITORING LOCAL TRENDS IN RECREATION AND TOURISM THROUGH VISITOR STATISTICAL ABSTRACTS

Chad P. Dawson

Abstract. Information on recreation and tourism trends are often difficult to obtain for local and regional planning and management decision-making. Monitoring of use in a demonstration project was conducted through the compilation of secondary data sources via a network of public and private cooperators. A monthly statistical abstract was generated from cooperator reports that were stored and analyzed on worksheets in a microcomputer system.

INTRODUCTION

The recreation and tourism industry is an important component of Minnesota's economy. In 1983, U.S. travelers in Minnesota spent \$4.4 billion which directly generated over 111 thousand jobs (FTE); employees in those jobs earned \$951 million in wages and salary income (U.S. Travel Data Center, 1984). The northeastern region of Minnesota, with its natural environment of lakes and northern forests, is more economically dependent on the recreation and tourism industry than other more agricultural or urban areas within the state. However, information on recreation and tourism trends are often difficult to obtain for local and regional planning and management functions (e.g., marketing evaluation, measuring performance).

The identification of trends or changes in performance is a difficult but necessary task, as Newby and Lilley suggested in 1980: "planning without empirical data on which to base sound decisions or solutions is somewhat akin to skydiving with a businessman's umbrella -- things go well until that final moment of truth when responsiveness to need must be evaluated."

Researchers using quantitative techniques to analyze past outdoor recreation trends and to forecast future demand have made substantial progress, in the past 10 years, toward developing more accurate and complex methods and models (e.g., Stynes, 1983). However, a communication and information gap exists, for various reasons, between the existing state-of-the-art in research and the ongoing needs of many recreation practitioners -- planners, managers, and administrators. The development of practical and scientifically sound approaches to constructing and reporting indices related to recreation and tourism trends is necessary for planning and management functions, as well as for other purposes such as accountability and educational materials.

Monitoring use is one means of providing some trend information and measures of performance. Although monitoring is generally restricted to a

limited number of locations or indices of activity, the major benefit of such measurement is that the indices offer the potential to assess comparative change on a continuing basis. Secondary data sources from published and unpublished records maintained by public agencies and private businesses offer an important source of information for trend or change assessments. Consideration of various types of potential bias is a prerequisite to using a secondary data source (Avedon and Smith, 1980) and should be followed by a continual process of quality control checks with the cooperating public agencies and private businesses (LaPage, 1980).

CASE STUDY

In 1982, the Minnesota Sea Grant Extension Program and the Duluth Attraction Centers Council combined their efforts to create the "Duluth and Northeastern Minnesota Visitor Statistics Abstract." The objective of the Duluth Attraction Centers Council, a group of public facility managers and administrators, was to develop a monthly statistical abstract to track changes in use at their facility plus compare their trends with other indices of use within Duluth and the northeastern area of the state. The objective of the Minnesota Sea Grant Extension Program involvement was to develop a demonstration educational/service project that utilized secondary data sources via a network of public agencies to produce a monthly statistical abstract of recreation and tourism trends.

The conceptual framework for developing the abstract was that secondary data sources were already maintained by public agencies for a variety of educational, planning, management, and administrative functions (e.g., auditing for accountability, measures of performance) but often were only compiled on an annual basis for specific reports or tasks. Monitoring was viewed as a valuable feedback mechanism to managers and administrators since information should be furnished at regular intervals during the operation of a public facility or program. Although the use of secondary data sources for analysis is often considered to be not as scientifically rigorous as would be expected in a time-series experimental design, statistical abstracts can be developed to provide reliable and valid information as an ongoing decision-making tool.

The statistical abstract for Duluth and northeastern Minnesota was designed to incorporate multiple indices to adequately represent the complexity of the recreation and tourism industry and its geographic distribution. The selection of each index and the overall mix of indices required consideration of the degree of objectivity, validity, and reliability evident in the approaches and techniques used to develop each secondary data base. Measures of the absolute levels of performance (e.g., attendance) were preferred, although measures or indices of comparative change (e.g., sales tax receipts) were generally acceptable. Additionally, regular monthly meetings of the Duluth Attraction Centers Council were used as a mechanism to help identify intervening conditions or circumstances (e.g., new hours of operation, changes in marketing, inclement weather) that directly or indirectly affected the measures or indices over time.

During the past three years, the abstract has expanded to 23 indices (Table 1) and interest in cooperating has been expressed by additional public agencies and programs. Participation is predominantly from publicly managed historic and interpretation-oriented visitor centers, highway tourism information centers, outdoor recreation facilities, and sports/recreation/leisure facilities. Estimates of tourism spending and commercial lodging occupancy are provided by the Bureau of Business and Economic Research, at the University of Minnesota/Duluth, as part of its monthly business index report. Statistical information is provided by the City of Duluth tax office for the 1% tax receipts on food and beverage sales at licensed businesses and the 3% tax receipts on hotel/motel room rentals. Other sources include railroad ridership from Amtrak and city bus tour ridership from the Duluth Transit Authority.

Cooperation has been generally limited to the public sector due to the reluctance of commercial operators to participate and risk any possible disclosure of income. The use of aggregated data, such as the commercial lodging occupancy for Duluth, may provide an acceptable means of compiling information on private sector recreation and tourism business trends.

Further expansion of the outdoor recreation indices is being pursued with public agencies to monitor intensive use at developed sites and, to some extent, dispersed use on publicly-owned forest lands. The use of the northwoods lake country, as a recreation and tourism resource base, in northeastern Minnesota suggests developing a greater number of indices related to outdoor recreation activity participation and facility use.

All cooperators submit brief monthly reports by mail or telephone, each entry is added to the appropriate computer worksheet file by Sea Grant staff, and a monthly statistical abstract is generated and copies are mailed to cooperators. Each index in the abstract is a separate worksheet (see example in Table 2) maintained with the support of a software package (i.e., Super Calc) on a microcomputer system (i.e., IBM-PC). Three types of products are produced as part of the statistical abstract process: (1) separate worksheets for each of the 23 indices are generated as quarterly and annual reports (Table 2); (2) monthly and annual summary tables that list the changes for all 23 indices and facilitate an assessment of comparative change (Table 1); and (3) annual reports that graphically depict the trends by year (Figures 1 to 5) or by month (Figure 6).

The following abbreviated analysis of the indicators is included here to show the utility of the abstract and is intended to be descriptive rather than statistical. The emphasis, to date, in this project has been on the process of abstract development and in the future will be more analysis oriented.

RESULTS

The volume of traffic using the tourism information centers along highways in northeastern Minnesota generally has been increasing in the

TABLE 1. Duluth and northeastern Minnesota visitor statistics summary for 1984.

INDICES	% Yearly Change (1984)		Actual Yearly Total 1984
	Compared to 1980-83	Compared to 1983	
<u>Highway Tourism Information Centers</u>			
Anchor Lake Information Center	+ 49.4	+ 9.5	251,579
R.J. Houle Wayside Rest & Information Center	+ 50.3	+ 32.3	28,671
Thompson Hill Information Center	+ 31.4	+ 22.1	278,200
<u>Historic and Interpretation-Oriented Centers</u>			
Canal Park Visitors Center	- 1.9	+ 8.4	469,552
Glensheen Mansion	- 7.2	- 2.4	118,936
St. Louis County Heritage and Arts Center	- 5.3	- 7.7	119,438
Tweed Museum of Art	- 15.5	- 6.0	78,409
U. S. Hockey Hall of Fame	- 21.9	- 13.5	13,774
S. S. Meteor Maritime Museum	+ 1.1	- 1.5	31,039
Iron Range Interpretative Center	+ 18.3	- 10.0	102,655
Forest History Center	- 12.4	+ 3.2	29,349
<u>Outdoor Recreation Facilities</u>			
Spirit Mountain Ski Area	- 8.9	- 3.5	92,827
Gooseberry Falls State Park	+ 9.6	+ 5.7	653,118
Split Rock Lighthouse State Park	+ 21.3	+ 46.6	281,612
Jay Cooke State Park	+ 0.4	+ 19.5	149,325

Table 1. (continued)

Sports/Recreation/Leisure Facilities

Duluth Arena	-	17.5	-	25.6	502,158
Duluth Zoological Gardens	+	2.4	+	12.3	46,727

Travel and Tourism

Tourism Spending in Duluth - Current Dollars	+	10.5	+	9.9	62,803,000
Duluth 1% Sales Tax Receipts - Food and Beverages	+	10.4	+	8.1	608,629
Duluth 3% Sales Tax Receipts - Hotel/Motel Room Rentals	+	15.5	+	12.9	336,747
Commercial Lodging Occupancy in Duluth	+	2.7	+	8.8	369,776
Twin Cities/Duluth Amtrak Ridership	-	24.5	-	12.5	63,050
DTA Discover Duluth Tour	-	3.6	-	23.2	7,466

Table 2. Example of statistical abstract worksheet maintained for each index:
Canal Park Visitors Center, Duluth, Minnesota.

Month	ESTIMATED			NUMBER OF VISITORS		
	Monthly Totals		1984 actual	% Monthly Change (1984)		1983 actual
	1980-83 average	1983 actual		Compared to 1980-83 (%)	Compared to 1983 (%)	
January	1759	1804	1848	5.06	2.44	1759
February	3251	4746	3206	- 1.38	- 32.45	5010
March	4817	5148	4426	- 8.12	- 14.02	9827
April	19884	17955	21247	6.85	18.33	29711
May	50979	35224	40468	-20.62	14.89	80690
June	77336	60990	71504	- 7.54	17.24	158026
July	109154	103972	112477	3.04	8.18	267180
August	108470	101767	106322	- 1.98	4.48	375650
September	55527	52086	56620	1.97	8.70	431177
October	33250	40606	35219	5.92	- 13.27	464427
November	10735	6910	11934	11.17	72.71	475162
December	3356	1951	4281	27.56	119.43	478518
TOTAL	478518	433159	469552	- 1.87	8.40	478518

Source: Canal Park Visitors Center monthly report.

Note: Number of visitors recorded by an electrical counter operated at the main entrance.

Figure 1.
Highway Information Center
Annual Visitation

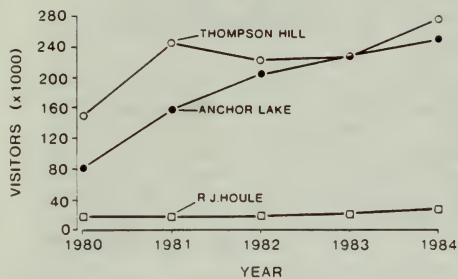


Figure 2a.
Historic and Interpretation Center
Annual Visitation

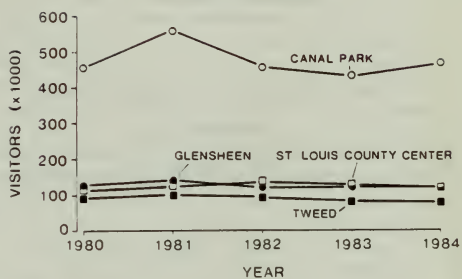


Figure 2b.
Historic and Interpretative Center
Annual Visitation

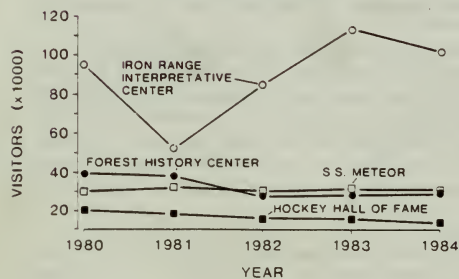


Figure 3.
Outdoor Recreation Facilities
Annual Attendance

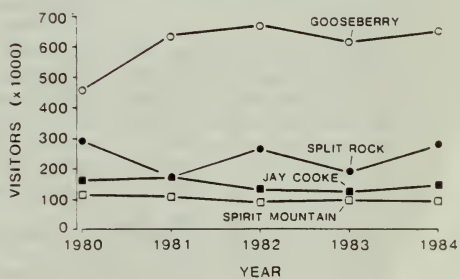


Figure 4.
Travel/Tourism Annual Expenditures
and Tax Receipts

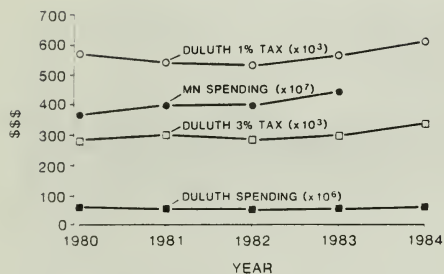


Figure 5.
Duluth Arena Attendance and
Commercial Lodging Occupancy

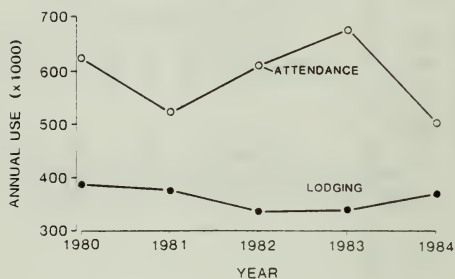
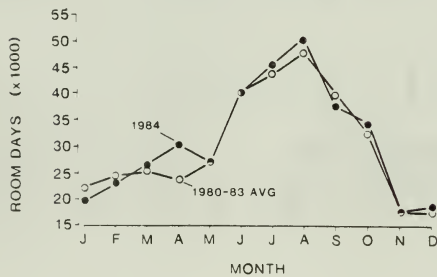


Figure 6.
Duluth Commercial Lodging
Monthly Occupancy



five-year period from 1980 to 1984 (Figure 1). The dramatic increases in traffic counts at these centers has generally not been reflected in related increased use at other recreation and tourism facilities.

The number of people visiting the historic and interpretation-oriented centers tended to reach a high point in 1980-81 and then remain constant or decline slightly until 1984 (Figure 2A and 2B); two centers reported small gains in 1984 over 1983. One notable exception to these generalizations was the opposing trends reported by the Iron Range Interpretative Center; however, visitation was prohibited in the last several months of 1984 due to building renovations and prior to that closure the cumulative visitation was running ahead of 1983 totals. Public facility managers have expressed some concern that trends may indicate a declining phase in the "product life cycle" curve and new displays, renovations, and new marketing initiatives may be necessary to increase attendance to previous levels.

Use at the Spirit Mountain Ski facility has been on a gradual decline during 1980-84 (Figure 3). The facility has expanded its cross country ski trails and facilities to better compete in that increasing skier market. Outdoor recreational use at three state parks was variable in 1980-83 but all three parks reported substantial increases in 1984 over 1983 visitation.

The expenditures of travelers in Minnesota gradually increased during 1980-83 at a rate only slightly greater than inflation (Figure 4); 1984 data was not available at this printing. Expenditures of travelers to Duluth declined from 1980 to 1982 and then increased to \$62.8 million in 1984 when annual expenditures exceeded 1980 levels. In Duluth, similar trends were noted with the 1% and 3% sales tax receipts (Figure 4) and the commercial room occupancy totals (Figure 5). These indices all showed increases in the 1983-84 time period.

Attendance at the Duluth Arena was variable over the five-year period with a considerable decrease in 1984 over the 1983 attendance levels (Figure 5). Annual attendance at the Arena is dependent on attendance at sporting events, conventions, exhibits, shows, and a wide variety of special events. Some events reoccur each year while the number and type of special events varies considerably from year to year, contributing to substantial annual variations in attendance.

Figure 6 is included as an illustration of the capabilities for computer graphic analysis of monthly trend data. Such analyses are of particular interest to managers assessing the performance of their facility, especially as marketing and promotional efforts increase to establish a year-round recreation and tourism clientele in Duluth and northeastern Minnesota.

DISCUSSION

Overall, the process of organizing the network of cooperators,

selecting appropriate indices, developing an approach and computer system to produce the statistical abstract, and producing and distributing the various reports has been very successful. Managers and administrators use the information generated and are very committed to continuing the cooperative venture. The number and type of indices has been increasing to better represent the diversity of the recreation and tourism industry and related public agencies, plus the geographic distribution of the facilities and services. The Minnesota Office of Tourism has requested that the statistical abstract be incorporated, in part, into its statewide report and new reporting process on regional trend indicators.

In the future, new indices will be added to the system but the number of additions will be constrained by staff and budget considerations. More public agencies have expressed interest in becoming cooperators than the current system can accommodate. Private commercial businesses are reluctant to participate until a reliable system is devised to aggregate use data and assure that individual business information is not disclosed.

The objectives of the next phase of this demonstration project are as follows: (1) the addition of a limited number of recreation and tourism indices to better represent outdoor recreation participation and commercial business trends; (2) the testing and development of a statistical model to produce short-term forecasts using simple trend extensions for a few selected indices; and (3) setting up an organizational entity to produce the statistical abstract on a sustained basis, when the system is fully developed and operational.

This case study suggests that other regions in the United States could develop a recreation/tourism visitor statistical abstract to monitor local changes and trends for planning and management functions. The creation of an abstract requires consideration of several basic factors: (1) the ability to locate secondary data sources and select appropriate indicators or measures of change; (2) the ability to obtain sustained cooperation from a network of public agencies and private sector businesses; (3) the use of a microcomputer to process the data and maintain worksheet files; and (4) sufficient staff resources to collect and analyze the data and produce monthly reports in a consistent and reliable time frame.

LITERATURE CITED

- Avedon, E.M., and S. L. J. Smith. 1980. Data banks for recreation supply and participation. In Proceedings 1980 National Outdoor Recreation Trends Symposium, Volume I, pp. 243-249. Northeastern For. Exp. Stn., Broomall, PA.
- LaPage, W. F. 1980. Research problems in monitoring recreation trends. In Proceedings 1980 National Outdoor Recreation Trends Symposium, Appendix, pp. 50-57. Northeastern For. Exp. Stn., Broomall, PA.
- Newby, F. L., and W. D. Lilley. 1980. Cross-country skiing trend data:

Planning for participant needs. In Proceedings 1980 National Outdoor Recreation Trends Symposium, Volume II, pp. 125-133. Northeastern For. Exp. Stn., Broomall, PA.

Stynes, D. J. 1983. An introduction to recreation forecasting. In S. R. Lieber and D. R. Fesenmaier (eds.), Recreation planning and management, pp. 87-95. Venture Publishing, State College, PA.

U.S. Travel Data Center. 1984. The economic impact of travel on Minnesota counties in 1983. 27 pages. Washington, D.C.



3 1604 005 190 360

GV191.4

571131

.N36

1985

Ret'd. JAN 24 '95

v. 2

~~NOV 14 1988~~

IL - Lib. Ag. Univ.

Due: 900 430

Ret'd MAY 30 1990

FEB 06 1995

NOV 12 1995

OCT 13 1998

Citation and Abstract:

Wood, James D., Jr. (ed.). 1985. Proceedings 1985 National Outdoor Recreation Trends Symposium II. U.S. Department of the Interior, National Park Service, Southeast Regional Office, Atlanta, Georgia.

Proceedings (in two volumes) of the second national symposium on outdoor recreation trends, held at Myrtle Beach, S.C. on February 25-27, 1985. Volume I (General Sessions) contains papers on recreation activity and tourism trends, public and private sector recreation trends, economic trends, trend measurement methodologies, and future policy implications. Volume II (Concurrent Sessions) includes papers on recreation trends in coastal, urban, and wilderness areas, marine recreation, economic impacts of tourism on rural development in the northeast (Hatch Project NE-137), tracking and measuring trends, and trends in outdoor recreation planning and management.

Editor's Note:

This Proceedings was photographed from copy submitted by the contributors. The U.S. Department of the Interior, National Park Service, does not assume responsibility for any errors contained herein.

Published by:

U.S. Department of the Interior
National Park Service
Science Publications Office
75 Spring Street, S.W.
Atlanta, Georgia 30303

12

